

The Employment Effects of State Hiring Credits During the Great Recession

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Abstract: The Great Recession led to levels of job loss and unemployment that are the worst on record since the Great Depression. State and federal policymakers grappling with the aftermath of the Great Recession have sought ways to spur job creation, in many cases adopting hiring credits for that aim to induce employers to create new jobs. However, there is virtually no evidence on the effects of these kinds of counter-recessionary hiring credits – the only evidence coming from much earlier studies of the New Jobs Tax Credit from the 1970s. The goal of this paper is to provide evidence on the effect on job growth of hiring credits adopted during the Great Recession on job growth. For many of the types of hiring credits we examine we do not find positive effects on job growth. However, some specific types of hiring credits – including those targeting the unemployed and those that allow states to recapture credits when job creation goals are not met – appear to have succeeded in boosting job growth. At the same time, some credits appear to generate hiring without increasing employment, consistent with these credits leading to churning of employees that can raise the costs of producing jobs via hiring credits.

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I. Introduction

The Great Recession led to levels of job loss and unemployment that are the worst on record since the Great Depression (Elsby et al., 2010; Martínez-García and Koech, 2010). For most states unemployment rates climbed to higher levels than in any post-War recession, and in general the high levels of unemployment reached during the Great Recession have been more persistent than in past recessions (Pittelko, 2011). Naturally, state and federal policymakers grappling with the aftermath of the Great Recession have sought ways to spur job creation, in many cases adopting hiring credits for that aim to induce employers to create new jobs. The Hiring Incentives to Restore Employment (HIRE) Act established a modest credit for 2010 at the federal level. The goal of this paper is to provide evidence on the effects on job growth of state hiring credits adopted during and after the Great Recession.

As summarized in Neumark (2013), there is a research literature arguing that hiring credits are ineffective (Bartik, 2001; Dickert-Conlin and Holtz-Eakin, 2000; Katz, 1998). However, most of the evidence pointing to ineffective hiring credits comes from hiring credit programs that target the disadvantaged, in contrast to hiring credits that are non-categorical or at least do not target the disadvantaged, and which explicitly try to incentivize job creation, especially during recessions.

There is much less evidence on hiring credits that explicitly tried to boost hiring in the aggregate – with essentially the only evidence coming from the New Jobs Tax Credit (NJTC) of the late 1970s. This evidence is more positive, and suggests that a hiring credit that is non-categorical and creates explicit incentives for job creation can help create jobs. However, the evidence on the NJTC is very limited – both because it is dated, and because of the usual difficulties of identifying the effect of policy at the national level stemming from the problem of constructing a counterfactual for what would have happened absent the NJTC.

As this paper documents – for the first time, to the best of our knowledge – there is an extensive set of state hiring credits. Many of these were in existence prior to the Great Recession, and some were enacted during the Great Recession. Yet there is virtually no empirical work on these state credits.¹ It is

¹ There are only a few exceptions. Bartik and Erickcek (2010) evaluate the MEGA Tax Credit Program in Michigan, which is quite different from other hiring credits. In addition, there are some evaluations of small-scale

the combination of the conjectures about the beneficial effects of hiring credits in the context of a severe recession, coupled with the availability of information on multiple state-level hiring credits, which provide the motivation for the question this paper addresses: whether state hiring credits adopted during and after the Great Recession boosted job growth.

In addition, based on the existing evidence limited evidence on hiring credits, as well as theoretical reasoning, Neumark (2013) offers some suggestions for structuring hiring credits to make them more effective tools for countering the adverse labor market impacts of recessions. Among these suggestions are targeting the unemployed, specifying the credit as temporary, and incentivizing increases in employment rather than hours. However, these suggestions are speculative, based on at best a patchwork of evidence, most of it quite dated. A second motivation for this paper, then, is to estimate the differential effects of state hiring credits that vary along these (and other) dimensions, to try to reach specific conclusions about how hiring credits should be constructed to be more effective. Because we wanted to answer this question, we devoted a great deal of effort to assembling a database of the various state hiring credits that have been enacted, and our empirical analysis is geared towards estimating the effects of the many different types of credits that exist, although this is a challenging task given the many types of credits used, and the our focus on those adopted during or after the Great Recession.

Finally, there is a long-standing concern that hiring credits can be very inefficient, as they can reward hiring that does not create net job growth. Credits may be paid to firms that would have been hiring anyway, or to firms that churn employees to exploit hiring credits. The payments to firms that do not create net job growth are referred to as “windfalls.”² By looking at the effects of hiring credits on hiring as well as net job growth, we can assess the importance of these windfalls, and see whether

hiring credit (or “voucher”) experiments (see Burtless, 1985, and the discussion in Hollenbeck and Willke, 1991). Finally, a recent, preliminary paper (Chirinko and Wilson, 2010) estimates the effects of state hiring credits, finding some modest evidence of positive effects. They focus on some subtler issues of the timing of effects based on the effective versus the signing date of the credit, stemming from theoretical considerations. The proposed research differs in numerous ways, including its focus on the moderating effects of hiring credits on the impact of the Great Recession, and using a much more comprehensive database on state hiring credit programs. (Indeed, we do not know which subset of the many hiring credits we capture in the database are used in the Chirinko and Wilson analysis. They report a maximum of 20 states with hiring credits in their sample period of 1990-August, 2009; they provide no information on the type of credits in their database; and they never appear to allow for multiple types of hiring credits for a state at a point in time.)

² For more discussion, see Neumark (2013).

particular types of credits are more or less effective at creating net job growth along with hiring.

II. Specific Hypotheses

The empirical analysis asks whether job creation hiring credits enacted during the Great Recession increased job growth. We look at numerous types of hiring credits, as described in Section IV.

The theory of hiring credits is straightforward. Hiring credits subsidize wages when employers hire from particular groups of workers, and therefore should boost labor demand and hence employment by reducing the effective wage paid by employers. Practical complications, however, can substantially reduce the effects of hiring credits. First, it is hard to design a hiring credit that rewards net new job creation, rather than rewarding hiring that would have occurred anyway, generating “windfalls” for firms. Thus, hiring credits can potentially be costly without creating a lot of jobs. Second, to sharpen incentives for net job creation, policymakers impose administrative requirements on firms, and the costs of compliance can deter use of the credit. And third, when hiring credits are targeted at disadvantaged workers, these workers can be “stigmatized,” with their eligibility for the credit signaling low productivity to employers. Most of the research on hiring credits studies those targeting the disadvantaged, and attributes their ineffectiveness to stigmatization (Katz, 1998).

However, evidence on hiring credits that focus on net job creation and perhaps re-employing the unemployed is more relevant in thinking about policy responses to the Great Recession and future recessions. Katz (1998) concludes that evidence from studies of the NJTC – the prime historical example of a hiring credit targeting net job creation – shows that a “temporary, noncategorical, incremental subsidy has some potential for stimulating employment growth” (p. 31). And more recently, researchers have taken a stronger position on its effectiveness (Bartik and Bishop, 2009; Bishop, 2008).

One of the principal reasons an anti-recessionary hiring credit may be more effective is that, coming on the heels of a steep recession, stigma effects are likely to be severely weakened or eliminated for a credit that is either non-categorical or that targets the unemployed. Employers likely understand that many people become unemployed in a recession because of external adverse shocks to their employers, rather than because of individual low productivity, malfeasance, etc. And when employment has largely

been falling, it should be easier to reward hiring that would not have occurred absent the credit, reducing windfalls (although the Job Openings and Labor Turnover Survey shows that there was still plenty of hiring going on at the depths of the Great Recession, although monthly hiring declined from a peak of just over 5.5 million before the recession to a low of around 3.7 million).³ For example, in the current environment, basing eligibility simply on whether a firm's employment is growing might pose acceptable windfall costs. A simple rule for establishing eligibility also imposes smaller costs on firms, making the credit more effective, and a credit targeting the unemployed is administratively simple, as it is easy to verify unemployed status.

An important part of the analysis is its focus on the design of effective state hiring credits. For example, poorly-designed credits can be ineffective or have perverse effects, such as incentivizing churning of workers rather than longer-term employment (Katz, 1998); and credits that target full-time employment rather than full-time-equivalent employment can lead employers to substitute full-time for part-time workers, a negative influence on employment. The variation among state hiring credits regarding different ways to incentivize net new hiring, targeting, and other dimensions (documented below) can provide important information on how to increase the job-creating potential of these credits.

III. Empirical Approach

The empirical strategy is to compare actual job growth in states as the Great Recession unfolded, comparing the experiences of states that did and did not implement particular types of hiring credits, controlling for other factors so as to isolate the effects of state hiring credits. Perhaps the most important control variable we use can be viewed as a counterfactual business cycle measure, intended to capture what the impact of the recession in each state would have been absent a state's hiring credits.

We construct this counterfactual business cycle measure by applying national time-series changes in disaggregated industry employment to the state, based on the state's industry composition in a baseline period of stable aggregate economic growth. To provide a simple example, if a state, at baseline, had 50% of employment in the auto industry and 50% in the restaurant industry, then the counterfactual for employment change over a given period would be an equally-weighted average of the employment

³ See <http://www.bls.gov/jlt/data.htm> (viewed December 21, 2012).

change nationally in these two industries.

More generally, let subscripts j index states, k industries, and b the baseline period (which differs depending on the analysis and the data used). Denote by SE_{jkb} total employment in state j , industry k , and period b , denote by AE_{kt} aggregate (national) employment in each period t in industry k , and denote by AE_{kb} aggregate employment in industry k in the baseline period b . Then state employment based solely on aggregate developments can be predicted in each period subsequent to b by applying the national changes to the baseline composition, as in

$$(1) \quad PSE_{jt} = \sum_k SE_{jkb} \times \left(\frac{AE_{kt} - AE_{kb}}{AE_{kb}} \right).$$

This equation predicts state employment in each period by applying the national growth rate of employment in each industry between the baseline period and that period to the baseline employment level in the corresponding industry in the state, and then aggregating, weighting by the baseline industry distribution of employment in the state. In this paper, we study the 2007-2011 period. Because we use lags in some of the specifications described below, the baseline for computing industry composition is 2006. We use monthly data, so we compute the average over all 12 months of 2006.

We estimate regression models relating changes in job growth to the counterfactual cycle, other controls, and state hiring credits. To be more specific, denote the level of state employment as E_{jt} , and denote by HC_{jt} a dummy variable for a hiring credit in state j and period t . Let T_l period dummy variables (for each unique month in the sample), and M_c denote a vector of calendar month dummy variables. We estimate the model in first differences, so we do not include state dummy variables. Then baseline regression we estimate to measure the effects of hiring credits on employment is:

$$(2) \quad \Delta \ln(E_{jt}) = \alpha + \sum_{k=0}^{12} \beta_k \Delta HC_{j,t-k} + \sum_{k=0}^{12} \gamma_k \Delta \ln(PSE_{j,t-k}) + \sum_{l=2}^T \tau_l T_l \\ + \sum_{s=1}^S \sum_{r=1}^C \{ \mu_{sr} S_s \times M_r \} + \sum_{s=1}^S \{ \pi_s \Delta \ln(PSE_{jt}) \times S_s \} + \varepsilon_{jt}.$$

This specification estimates the effects of changes in hiring credits on the change in employment, allowing effects with lags up to 12 months after credits are adopted. The specification includes the counterfactual business cycle measure, also with lags up to 12 months. In addition, there are time dummy variables for each month in the sample, to control for aggregate factors not capture in the controls. The

interactions between the state dummy variables (S) and calendar month dummy variables (M) allow for different monthly patterns of employment changes in the data, to control for spurious influences of the months when credits are adopted. And the interactions between the counterfactual cyclical measure (PSE) and the state dummy variables allow the effects of this cyclical variable to differ by state; such differences could arise, for example, because the same magnitude of the shock to two different states could reflect employment changes in different industries. That could happen because of state differences in the types of employment in an industry. For example, two states might have equal employment in the auto industry, but one manufactures luxury cars for which demand may be more cyclically sensitive, whereas another manufactures compact cars for which demand is less cyclically sensitive. Or states may differ in their exposure to domestic versus international markets, even if their industry composition is similar.

The key parameters in equation (1) are the β_k 's, which capture the contemporaneous and lagged effects of changes in hiring credits on employment. If hiring credits boost employment, we would expect the values of the β_k 's to be positive, at least for some period.

We also might expect the effects of hiring credits to occur with a lag, perhaps because it takes time for employers to learn about them. For example, Perloff and Wachter (1979) present evidence suggesting that firms' knowledge about the NJTC influenced whether it affected job growth, and conclude that lack of information about the NJTC diminished its effectiveness. In addition, data on California's New Jobs Credit suggests that the number of jobs for which the credit was claimed was very low (200-300 jobs per month) in the first couple of months after it took effect but then rose to a higher but still quite low level (about 1,500 jobs per month).⁴ We compute sums of the β_k 's over various periods (current only, through 4 lags, 8 lags, and 12 lags), and report these in the tables.

While this is our basic specification, we are interested in the effects of different types of hiring credits. As described in detail in the next section, we classify hiring credits along a number of dimensions, and then instead of having a single dummy variable for the presence of a hiring credit, we

⁴ See https://www.ftb.ca.gov/businesses/New_Jobs_Credit.shtml (viewed December 21, 2012). We estimated jobs for which the credit was claimed by dividing total credits paid by the maximum \$3,000 credit per worker.

have multiple dummy variables for the presence of a hiring credit of a particular type. We also estimate specifications with some alterations in the control variables; these specifications are described along with the empirical results, in Section V.

Our focus is on hiring credits adopted during or after the Great Recession. We only obtain identifying information from states where there are changes in hiring credits over the sample period. As we document in the next section, states have adopted scores of hiring credits over recent decades. However, the number adopted in the period we study – 2007-2011 – is of course much smaller, limiting our identifying information. Moreover, there is even less adoption of or variation in hiring credits with specific features. In future work we will extend the analysis to a longer sample period, obtaining information on the effects of more hiring credits. The more limited focus of this paper on the Great Recession and its aftermath is motivated by wanting to know what credits adopted during that period accomplished.⁵

The discussion to this point has been in terms of state hiring credits. As noted earlier, the federal HIRE Act, establishing a modest credit, was enacted in 2010. In contrast to research on the NJTC, which faced the usual problems of inferring the effects of a policy that is set nationally, in the present framework the effects of the HIRE Act can be identified more reliably. In particular, those states with hiring credits that most closely paralleled the HIRE Act prior to the latter's enactment can be delineated. The effect of the HIRE Act can then be identified from its differential impact on states that did and did not have similar hiring credits of their own before the HIRE Act became effective.

Finally, robust inference requires clustering the data at the level of the state to allow for arbitrary patterns of serial correlation within states, and heteroscedasticity across states. With 50 states, the asymptotic approximations should provide reliable inference (Cameron et al., 2008).

IV. Data

Information on State Hiring Credits

⁵ There is a related question of whether hiring credits that were already on the books when the Great Recession served to moderate the effects of the recession. However, since these credits would not have lowered hiring costs during the Great Recession there is no theoretical reason to expect such an effect.

The key input into the empirical analysis is a detailed database on state hiring tax credits that we have constructed. The hiring credits database provides information on job creation programs in all 50 states for the period 1969-2012. We identified 147 hiring credits. In June, 2012, 128 of these programs were current while 19 had expired or been replaced.⁶ As these numbers indicate, many states have multiple credits. Figure 1 is a histogram showing the highest number of hiring credits that states had at any point in our sample period. There are 45 states that had at least one hiring credit at some point during the whole period. The five states that did not have any program are Alaska, New Hampshire, South Dakota, Washington and Wyoming. There are also five states with only one program: Hawaii, Maine, Minnesota, Montana, and Oregon. The remaining 40 states had two or more hiring credits over the period, and of these, most had two to four credits. Virginia is the state with the largest number of programs (a maximum of ten during the sample period, but nine currently).

Table 1 provides information on when hiring credits were adopted, and their durations. Most hiring credits were created after 1989, and almost half were created in 2000 or later. While the table shows that many programs last for less than 10 years, this is driven partly by many credits being adopted in later years. Overall, state hiring credits have lasted for an average of 12.5 years. Figure 2 presents a more detailed view at the number of programs created each year.

We now turn to a discussion of the construction of the entire hiring credit database, although the empirical analysis focuses on the period 2007-2011. Later, we discuss changes in hiring credits in the analysis period.

States offer a complex package of incentives ranging from tax incentives based on different criteria (e.g., job creation) to financial assistance, technical support, training, incentives for creation of infrastructure, etc. Hiring credits are only a part of this set of incentives, and thus the first step in constructing the database is to define the criteria for inclusion of a program in the hiring credit database. The main criterion is that the program intends to create (or retain) jobs. This posed a challenge because unemployment is a politically charged issue, especially during and after recessions, and thus the potential

⁶ Two programs become ineffective after June 2012, and three additional programs become ineffective after December 2012.

job creation from any new program tends to be emphasized. While it can be argued that all programs have some impact on jobs, we used the following criteria to determine the inclusion of a program in the database:

- The program's law or regulations require firms to create or retain jobs or to increase payroll. Programs aimed at attracting new companies to the state (e.g., headquarters programs) are also included since by definition they create new jobs and, in most cases, they include an explicit job creation requirement.
- The program is broad in the sense that it covers a large portion of the firms or employees.⁷
- The program is targeted directly at the employer that is creating jobs. For instance, we do not include programs that foster infrastructure improvement by local governments on behalf of a business that is creating jobs.
- The program is not geographically targeted. In particular, we do not include enterprise zone programs or local hiring programs, such as those provided by local governments.⁸
- The program's costs are not borne by local governments. In particular, we do not include property tax abatements and tax-increment financing districts.

In addition, we do not include programs based on training, apprenticeships, or internships, research and development, or those related to the film industry. Also, we do not include either agricultural or financial programs (e.g., programs that provide loans or whose benefits are reductions in the interest rate on previous loans). In contrast, we do include programs that have broad targeting by industry (e.g., manufacturing), by company type (e.g., small businesses), or groups of workers (e.g., the unemployed).

Sources

To decide whether to include a program we compared the information contained in each source with the relevant laws in Loislaw,⁹ Westlaw,¹⁰ and LexisNexis.¹¹ For older hiring credits, we referred to

⁷ For instance, we do not include the Arizona's *Credit for Employing National Guard Members* or the Massachusetts's *Jobs Incentive Payments for Certain Biotechnology Companies*.

⁸ One exception is that Kansas's *Enterprise Zone Job Creation Tax Credit* is included in the database, because the incentives apply statewide.

National Association of State Development Agencies (1983, 1986, 1991, 2003). These publications provide a list and brief descriptions of the state incentive programs that existed in each particular year. Fahey et al. (1997) and Rogers (1998) provide an overview of state hiring credits as of 1997, but also include geographically targeted programs.

For the hiring credits currently in place we reviewed Business Facilities (n.d.), which provides an updated overview of state economic incentive programs, and compared this information with State Capital Group (2010), which also presents a large list of state incentive programs updated for August, 2010. We also used information from the Sierra Group's portal,¹² which focuses on employment programs for people with disabilities, and the website of Biggins Lacy Shapiro & Company, LLC (BLS & CO., n.d.), which covers a somewhat more narrow range of state incentive programs.

Finally, Mattera et al. (2011) provide an evaluation of state job creation credits. Their objective, however, is to verify whether the programs offered at the state level require job creation and if they provide "good jobs" in the sense of having some wage requirement and health or other benefits. Their sample, then, is broader than ours and has 238 programs including geographically-targeted programs, training programs, R&D programs, film-related programs, apprenticeship or internship programs. Consistent with our more limited criteria, Mattera et al. (2011) find that many of the programs in their database indeed do not require job creation.¹³ The information on hiring programs obtained from these sources was then confirmed and completed through a search on the websites of the Department of Economic Development, Department of Commerce, Department of Revenue, or the relevant state institution. Because almost every state's legislation concentrates business incentive programs in specific sections of the law, we also reviewed these sections to check for additional programs. The purpose of this exercise was above all to try to identify hiring credits that might have expired at some point in the past,

⁹ See <http://www.loislaw.com/>.

¹⁰ See <http://www.westlaw.com/signon/default.wl?sp=uci-2000&rs=imp1.0&vr=1.0&cbhf=none>.

¹¹ See <http://www.lexisnexis.com/lawschool/login.aspx>.

¹² Available at http://www.employmentincentives.com/state_incentives/state_incentives_intro.htm (viewed June 12, 2012).

¹³ Based on this project, Good Jobs First developed a database with over 400 programs (updated to October, 2012) to track companies that receive subsidies from states, available at <http://www.goodjobsfirst.org/subsidy-tracker> (viewed Nov. 5, 2012).

and that our historical sources did not cover. In a few instances we were able to find additional relevant programs that were not mentioned in other sources.

Coding of credits

State hiring credits differ along several dimensions. Here, we present a brief discussion of them. In Table 2 we provide a detailed description of each variable and the relevant categories, as well as a precise explanation of our coding. Table 3 summarizes the distribution of hiring credits along these dimensions and Appendix Table A1 presents a list of all programs with their particular features.

As shown in Table 2, state hiring credits vary first in terms of their duration (years of program). This is a central element of the hiring credits database because we are interested in the effect of different programs (and their various features) over time.

All the sources mentioned above provide information about the existence of a hiring credit at a given point in time, but none of them provides information about the credit's history. Hence, we relied on the legal information contained in Loislaw and Westlaw (for the relevant laws and their history), and LexisNexis (for the relevant acts). The history of each program can be recovered by looking at the acts that created and then modified the program. We used this procedure to establish the date at which the program became effective as well as whether it is current or had ended by June, 2012. Effective date means the date for which the program applies, i.e., the month of a year for which new hiring becomes eligible for the incentives of the program. Similarly, if the program has ended, the final date is the month of a year for which new hiring ends being eligible. Because the provisions of each program change over time, for each program we confirmed the initial effective date as the first date when the particular program included a job-creation component or when the program fit our criteria for inclusion.^{14,15}

¹⁴ For instance, North Carolina's *William S. Lee Quality Jobs and Business Expansion Act (Credit for Creating Jobs)* started in 1987 under the name of *Credit for Creating Jobs in Severely Distressed Counties*, and it was geographically targeted. Only in August 1996 the program was reformed to apply statewide, and thus we use August, 1996, as the starting date.

¹⁵ Neither Lexis-Nexis nor Westlaw provide access to the laws' acts before 1990. Hence, the effective dates for programs that start before this date, while correct according to the history provided in Lexis-Nexis and/or Westlaw, are not corroborated by looking at the actual acts, as was done for all other laws. For pre-1990 programs we looked at the amendments and determined the changes that were made so as to identify if the job creation requirements or other relevant features were introduced at the original date or later. This procedure was feasible in most cases, but not for a few, in which case we assigned the start date to the original credit.

Regarding the final date, it is important to note that in the case of programs that provide benefits for more than one year or that have carry-forward provisions, the final date applies only to new hiring; benefits for previous hiring are allowed for some additional time according to the provisions of the program. However, since these benefits do not apply to new hiring, they should not have an effect on new employment. Thus, we record as the final date the date that applies to new hiring.

The number of relevant acts for some longer-lasting programs can run into several dozen. Because of the difficulty this implies for following these precisely, we assume that every program exists from the effective date until June 2012 or the date when it ended. In particular, we do not allow for the possibility that there may be intervening periods for which the program was not effective. Also, the specifications of each hiring credit in the database reflect the most recent amendments (e.g., job creation requirements). While it is important to keep in mind that sometimes programs' provisions do change over time, and this is especially relevant for programs that have existed for longer periods, this should not be a significant issue for the analysis in this paper, since it only covers the period 2007-2011.

Finally, for some programs, the specific regulations are not specified in the law: i.e., the law provides the general framework of the program or creates the relevant agency to administer the program, but the states develop specific regulations only thereafter. Since it is not possible to determine when exactly these regulations were put in place, we used the effective date of the law as the starting date.

Returning to Table 2, hiring credit programs also differ in whether they are temporary or permanent. While this distinction is clear at the theoretical level – and we would predict a stronger effect of a temporary credit that shifts hiring to the period when the credit applies – this difference is not so clear in practice. In general, the period for which a program is in place does not follow a simple pattern. In principle, programs are enacted as either temporary or permanent. However, there are some exceptions in which programs are enacted with an undetermined period of applicability. In Oklahoma, for instance, the *Quality Jobs Program* may be ended on the basis of a triennial report by the Department of Commerce. Yet, the program was established in 1993 and is still effective. More generally, temporary programs are often extended – in some cases several times – and a permanent program can be repealed at any point in

time. For example, in Connecticut the *Tax Credit for Taxpayers Occupying New Facilities and Creating New Jobs* was enacted to end in December, 1994. Later, it was extended and then repealed effective January, 1998. Also in Connecticut, the *Job Creation Credit*, while enacted as permanent, was later made to expire effective January 1, 2012. Finally, states sometimes wish to change some particular feature of the available programs. This is often achieved through a change in the provisions of the program. However, in some instances, this leads to a full replacement of the existing program. For instance, Vermont's *Economic Advancement Tax Incentive Program*, which was enacted in 1998 as a permanent program, was repealed effective January 2007. The *Vermont Employee Growth Incentive* was then introduced. With these important qualifications in mind, we classify a program as temporary or permanent based exclusively on its initial enactment. More precisely, we code a program as temporary if the original act provides a date for it to end, and permanent otherwise, and we consider this a feature of the program throughout its existence. In a handful of cases we could not determine a classification as temporary or permanent.

Hiring credits also differ on the type of benefit provided. The majority of programs provide a tax credit, but there are a few ones that provide direct grants to the firms.

There are different requirements for firms to be eligible for hiring credits. We distinguish between programs that require increments in jobs, payroll, investment, or other factors (e.g., a new facility). These are not mutually exclusive, so a single credit can fall into more than one of these categories. As can be seen in Table 3, most programs (143) require the creation of new jobs, of which 64 have new jobs as the sole requirement. Investment is also a very common requirement (61 credits). Almost every program includes jobs or jobs and investment as part of the requirements, and 83% of all programs (121) require jobs only or jobs and investment.¹⁶ In part because of our focus on hiring credits targeting job creation, hiring credits included in the database are quite homogeneous in terms of their eligibility requirements. No program includes investment or other factors as the only requirements; i.e.,

¹⁶ This includes 64 programs that require jobs only and 57 programs that require jobs and investment only. The other four programs that require investment also have some additional requirement other than jobs.

they are always accompanied by a requirement of either new jobs or additional payroll. Furthermore, of the seven programs that include additional payroll as a requirement, only three have it as the sole one.

This homogeneity in eligibility requirements does limit the identifying variation available for the econometric analysis. In that analysis we therefore focus, instead, on the outcome that the programs use as the basis to determine benefits (number of new jobs, percentage of new payroll, percentage of new investment, or some other variable, such as sales taxes). There is of course some correlation between the eligibility requirements and the basis on which the benefits are provided, but they do differ significantly. Most importantly, as shown in Table 3, while only seven programs include payroll as an eligibility requirement, a total of 66 programs have new payroll as one of the outcomes on which benefits are based, and 20 have it as the only one.

We also classify hiring credits depending on their value per full-time equivalent job and full year of hiring. Because the benefits of some programs are connected to an unobservable variable (e.g., sales taxes), we were not able to assign a value per job to 23 programs. Among the remaining credits, 24 provide a benefit equivalent to \$1,000 or less per year, 78 a benefit higher than \$1,000, and 22 are discretionary, which means that the benefit provided is determined by the state agency responsible of the administration of the program.

These benefits have limitations, which vary across hiring credits. Thus, programs may limit the benefit to be equal to the tax liability, or they may allow it to be higher than the tax liability. In the latter case, firms may either carry forward to future years the fraction of the benefits above the current year's tax liability, or they may receive the full amount of the benefit in the current year (credit is refundable). Almost one third of all programs do not specify this limit and almost half provide a carry-forward provision.

Since we are interested in the effect of hiring credits on job growth, another important dimension along which programs vary is the type of employment required and the value per job provided. Employment required can be full-time, full-time equivalent or part-time. In a few cases, the program does not specify the type of employment required. Full-time is the most common requirement. Some

programs do provide benefits for part-time employment (which of course implies that they also provide benefits for full-time employment).

State hiring credits also differ in targeting based either on employee's characteristics (unemployed, disabled, and welfare recipients) or employer's characteristics (industry, size of the firm). Around half of all hiring credits have some type of targeting.

Finally, hiring credits present some additional characteristics that may affect their impact on job creation. First, many programs try to ensure that credits are paid for new job creation (for instance, by "recapturing" or "clawing back" some of the tax credit if net job creation is lower than required for payment of the credit). Second, several hiring credits determine either eligibility for the credit or the amount of the credit based on the wage level of the new jobs. In some cases there is a minimum wage level to which they apply, thus attempting to promote the creation of higher-wage or higher-skill jobs. Third, some programs vary their credit values and specific provisions (such as the wage level required of new jobs) according to the county (or type of county) where the new jobs are created. We capture this variation through dichotomous variables that represent the existence or absence of a particular feature: recapture provisions, wage requirements, and geographic provisions.

Appendix Table A1 summarizes all the variables that we code and provides additional details on their construction. For all categories within each variable we simply assign to each program a value of one or zero to denote the presence or absence of that particular feature.

Limitations

For the purposes of the econometric analysis, the main limitation of the hiring credits database is that each program is treated equally, i.e., we do not distinguish between "small" and "large" programs, understood as programs that can have a small or large effect on employment. The reason is that this distinction is not clear between states or even within states. For instance the *Virginia Economic Development Incentive Grant* requires a minimum of 200 new jobs and a capital investment of \$6,500 per job and provides a discretionary grant, while the *Small Business Jobs Grant Fund* requires only five new jobs and provides a grant of between \$500 and \$2,000 per job. Clearly, these two programs are quite

different and aim at very different types of firms. Yet, it is not clear which one has a larger impact on employment, since the latter can potentially reach many more firms. Thus, despite their differences, in the database the two programs are treated equally.

This example serves to illustrate a common pattern: programs vary significantly within and across states. Much of this variation is of course captured in the coding discussed above, but the issue of size remains. One option would be to weight each program by its outlays over time. However, an exploratory analysis revealed that only some states provide this information, and even then often not in a systematic way, but rather available only for some programs or and, in some cases, only for some years. Given these limitations, we define a program in terms of the characteristics discussed above, and do not try to quantify the size or scope of these credits.

Identifying information for the period we study

As noted in Section III, our empirical analysis incorporates many features of state hiring credits. While it is impractical to study all dimensions of state hiring credits simultaneously, different analyses can be done for different dimensions. Examples include: credits targeting the unemployed, welfare recipients, or neither; credits that explicitly target net job creation versus those that do not; and credits that allow for recapture or claw-backs versus those that do not. Thus, for example, for a two-way classification of hiring credits, two dummy variables JC_{jt}^1 and JC_{jt}^2 can be defined, and substituted for the single JC_{jt} in on equation (2) above.¹⁷ This allows the estimation of the effects of each type of credit on job growth, and testing for differences between these.

As we also discussed in Section III, the identifying information for the effects of state hiring credits on job growth comes from changes in state hiring credits during our sample period. For many of our analyses (and those reported in this draft), we focus simply on whether a state has a particular type of credit. Thus, we need to know how many states experienced a change in whether there was a particular type of credit. This information is reported in Table 4, for the type of classifications of hiring credits we consider. As the table shows, there is some variation in the number of states having almost every type of credit, although in many cases there is not a lot of variation. There are some exceptions. For credits

¹⁷ A given state at a point in time can have one, neither, or both types of credits.

targeting welfare recipients, and those for which we could not determine if a credit was temporary or permanent, there is no variation, the effects of these categories of hiring credits cannot be identified. For credits paying benefits based on part-time jobs, the only variation comes in 2006; since our sample period starts in 2007, we can only estimate lagged effects of this type of credit. Finally, as discussed later, we also look at differences in value of credits for the subset of credits targeting the unemployment (covered in the last panel of the table). In this case we only have variation for the high- and low-value credits, and not for the discretionary or not determinable ones.

The small number of credits that turn on during our sample period are also limiting because it would be useful to be able to look at effects of more features of hiring credits simultaneously. For example, we might want to look at credits that base benefits on investment *and* target manufacturing firms. But this is not possible with the amount of variation we have, so we can instead only focus on estimating the effects of “one-way” classifications of hiring credits. This is an inherent limitation of the data; a compelling research design requires identifying the effects of hiring credits from the states that change their credits, but there are not that many in the period of interest.

One issue that arises is how to capture or measure hiring credits. Much of the variation in hiring credits comes from states where a program already existed, sometimes of the same type. For example, in the aggregate, of the 38 programs created from January 2006 until December 2011, 36 were added in states that already had at least one program. The remaining two were created in California and Wisconsin in 2009. This raises the question of whether additional programs of the same type provide additional incentives to firms and thus, contribute to employment creation. We have chosen to code simply the existence of a credit of a particular type, rather than the number of credits. Additional credits of the same type may imply more credits available, or may simply reflect the proliferation of similar credits under different names. Preliminary analyses indicated that results were as strong or stronger for the dummy variables indicating presence or absence of credits, compared to counts of credits, suggesting that additional credits of the same type do not have additional effects.

Data on Labor Market Outcomes and Cyclical Indicators

Data on total and industry employment come from the Quarterly Census of Employment and Wages (QCEW).¹⁸ The QCEW provides monthly employment at the state level and by NAICS industry level. To construct the counterfactual cyclical measure (PSE) we used industry employment at the QCEW sector level, which corresponds to the NAICS 2-digit classification.¹⁹ One issue is that in the disaggregated state-by-industry QCEW data the information is sometimes suppressed, for some months, for confidentiality reasons. In these cases, we scale up the non-missing entries proportionally to match total employment for the month. Second, to avoid noise in our baseline industry composition, we compute the baseline industry employment by averaging over all 12 months in 2006, and then divide by the average of total employment across months. Finally, we have to assign a baseline industry composition to one particular month to construct our counterfactual business cycle measure for each subsequent month, but the annual averages do not match any specific month because we have used an average of industry composition over the year. We therefore rescale industry employment so that multiplication by this average share matches June 2006 employment, and then construct the cyclical measure relative to that month.

In our baseline specification we also include as controls Farber and Valletta's (2011) measure of the number of weeks of extended Unemployment Insurance benefits, both those added automatically from the Extended Benefits program and those from the Emergency Unemployment Compensation program. Both Farber and Valletta (2011) and Rothstein (2011) show that these recent expansions in the length of unemployment insurance led to increased unemployment durations, particularly for the long-term unemployed. These extended benefits could therefore have slowed job growth. The control variable we use is the number of weeks beyond the normal 26 weeks of Unemployment Insurance that are available in that state and month. Since we use a first difference model, this control is included in first difference form. We also include lags from one month to 12 months to control for the lagged effect of the Unemployment Insurance extensions. In addition to this control, we include first differences (through

¹⁸ All data used is available to download at <http://www.bls.gov/cew/data.htm>.

¹⁹ The Bureau of Labor Statistics introduced the new version NAICS 2012, which applies to QCEW starting in 2011. However, because this affects industry classification only at lower levels of disaggregation, it does not affect our classification.

lags of 12 months) of the higher of the federal or state minimum wage.

V. Results

Baseline Results

Results for our baseline model estimating the effects of hiring credits on job growth are reported in Table 5. Each panel in this table reports estimates from a different specification. Thus, the first panel reports estimates of the effect of the presence of a hiring credit of any kind, the second distinguishes between credits that require job growth, payroll growth, investment, or other criteria, etc. All specifications include a contemporaneous dummy variables (or dummy variables) for the hiring credit, plus 12 monthly lags. The table report the contemporaneous coefficients, and then the cumulative effect including lags through four, eight, and 12 months.

As reported in the first panel, there is no evidence of an effect of hiring credits when no distinctions are made among the features of hiring credits. One thing to keep in mind is that only two states provide identification of the effect of “any” credits (Table 4). However, that will often be the case when we look at the effects of specific types of credits, as well.

The second panel, in contrast, finds evidence of significant positive effects hiring credits whose benefits are based on investment (as well as those based on some other variable, for lags for four months or longer), but no evidence of positive effects – and indeed negative point estimates – of hiring credits that provide benefits based on jobs or payroll growth. We might expect hiring credits that provide benefits based on job growth to be the most successful at boosting employment, whereas a hiring credit based on payroll growth would not necessarily be expected to boost employment, because in the first case benefits are obtained exclusively through the creation of new jobs, while in the second case benefits may be obtained through the creation of a limited number of high-wage jobs. To interpret the magnitudes, the estimated coefficient of 0.0087 on the cumulative (through the 12 month lag) effect of hiring credits based on investment implies that employment is increased by 0.9 percentage points by the enactment of such a credit.

The next panel distinguishes between credits – for those based on jobs – that measure jobs using increases in full-time employment, full-time-equivalent employment, and part-time employment (as well as not specified). Broken down this way, there is a significant negative effect of credits based on increases in FTE employment, and, only when we accumulate the effects through lags of 12 months, a significant positive effect of credits based on part-time employment. The latter effect may arise because a credit based on part-time employment encourages firms to either hire part-time workers or split full-time jobs between two people, either of which would boost measured employment. The same argument might also predict a negative effect of credits based on full-time employment, although what we find is a negative effect of credits based on full-time-equivalent employment, which is harder to explain.

The next panel distinguishes credits based on their tax treatment. We might expect a refundable credit or one that can be carried forward to be the most valuable, since these give money to firms even if they do not have taxable income in the current year – a circumstance we might expect to be more frequent during or after a recession. In terms of the relative magnitudes of the estimated coefficients, the evidence is consistent with this. However, there is at best quite weak evidence of a positive effect of refundable credits (a t-statistic of 1.55 for the cumulative effect through lags of eight months), and the point estimates for credits equal to the tax owed are always negative.

The first panel in the second column of the table distinguishes between credits based on whether they imposed some kind of minimum wage requirement. A priori, we might expect a larger effect for credits that do not have a wage requirement, if the wage requirement is binding. On the other hand, it is possible that higher-wage firms that meet the wage requirement anyway are more responsive. Regardless, none of the estimated effects for this specification are statistically different from zero.

The following panel categorizes hiring credits based on whether there is a mechanism to recapture the credit if job creation goals are not met. We would expect a recapture mechanism to lead to more effective credits, either by enforcing job creation goals or encouraging only firms that could actually meet them to apply for credits. The evidence is consistent with this prediction, as there are fairly large and positive, significant effects of hiring credits with recapture provisions, but not of those without such

provisions. It would be of interest, of course, to learn about how these recapture provisions are actually implemented, as confirmatory evidence that these provisions have teeth.

Below this specification we distinguish among credits that target specific industries, manufacturing in particular, or that do not target by industry. In no case do we find significant positive effects. Interestingly, the effects of credits targeting manufacturing are negative and significant (after four months). One interpretation of this may be that this kind of targeted hiring credit is more the result of political pressure than of targeting to where the potential job creation effects are highest.

The next panel looks at the type of worker targeted. As noted in the Introduction, many hiring credits – and those generally deemed ineffective – have targeted the disadvantaged or disabled. What might be of more interest as a counter-recessionary policy, however, is a hiring credit targeting the unemployed. There are no new credits targeting welfare recipients in the sample period (see Table 4), so we cannot identify the effect of such credits. However, there are new credits targeting the unemployed and the disabled (and without targeting). The estimates show that hiring credits targeting the unemployed have significant and positive effects on employment, boosting employment by about 0.7 percentage points after four months, with the effect growing to 1.1 percentage points with the full 12 lags included. In contrast, there is no effect of the other types of hiring credits.

Finally, the last panel considers temporary versus permanent credits. Theory would predict that temporary credits would have the greatest short-run effect, since they should shift hiring into the period covered by the credit. However, recall from the discussion in Section III that in practice it is very hard to classify credits as temporary or permanent. Perhaps as a result, we do not find any evidence that either type of hiring credit has an effect.

Thus, the evidence from Table 5 suggests that certain types of hiring credits enacted during the Great Recession succeeded in boosting employment. These include credits that were based on investment, credits that are paid based on growth in part-time employment, refundable hiring credits

(weakly), credits that allow for recapture of payments if the required goals were not met, and credits targeting the unemployed.²⁰

Endogenous Determination of Hiring Credits?

To better assess whether endogenous determination of hiring credits based on past changes in job growth drives our results, we do two things. First, we augment our original specification by adding the lagged first difference of the log of employment (the dependent variable). The use of a lagged dependent variable is common in models of employment or job growth,²¹ and we expect the lagged dependent variable to control fairly well for state employment shocks, particularly since these are serially correlated.

The results with this lagged dependent variable included are shown in Table 6. The inclusion of the lagged dependent variable has very little impact on the estimates. We still find significant positive effects of credits based on investment, credits that are paid based on growth in part-time employment, and significant positive effects of credits that allow for recapture of payments if the required goals were not met, and credits targeting the unemployed. We also still find negative effects of credits based on full-time-equivalent employment, and credits targeting manufacturing.

A problem with including the lagged dependent variable, however, is that the lagged first difference ($\Delta \ln(E_{i,t-1})$) is correlated with the error term of the equation, which will lead to biased estimation of this variable that can also be transmitted to other coefficient estimates. We considered two approaches to obtain consistent estimates of this dynamic panel data model: the Anderson and Hsiao (1982) approach and the Arellano and Bond (1991) (also attributed to Holtz-Eakin et al., 1988) approach. Both instrument for $\Delta \ln(E_{i,t-1})$ using lagged values of $\ln(E_{i,t-j})$. By construction $\ln(E_{i,t-2})$ is correlated with $\Delta \ln(E_{i,t-1})$, making it a valid instrument. In fact, $\ln(E_{i,t-j})$ for all $j \geq 2$ are valid instruments. The exclusion restriction requires that $\ln(E_{i,t-j})$ is not correlated with $\Delta \varepsilon_{it}$, conditional on the controls. This requires that we must have no second-order serial correlation in $\Delta \ln(E_{i,t-1})$.

²⁰ We also estimated specifications like in Table 5, but with two modifications. First we added the 12 lags of the interactions between the counterfactual business cycle measure and state dummies, and second we dropped these altogether. The qualitative conclusions are very similar. Results are available from the authors upon request.

²¹ See, e.g., Görg and Hanley (2005), Gugler and Yurtoglu (2004), and Arellano and Bond (1991).

We first consider using $\ln(E_{i,t-j})$ from $j = 2, \dots, 12$ as instruments for $\Delta \ln(E_{i,t-1})$, estimating via 2SLS, as in Anderson and Hsiao (1982). Using all of these lags should provide the greatest efficiency gain, particularly since we do not have to drop early time periods from the sample to get lags of $\ln(E_{i,t-j})$, as lags are already used in the base model. However, all realistic subsets of instruments that we considered lead to a rejection of the over-identification test. For this reason we do not present these 2SLS results.

We also considered using the Arellano-Bond GMM approach, which is similar but more efficient than the Anderson and Hsiao (1982) approach. We run into similar problems with over-identification tests. However, this approach is most useful for “small T, large N” panels. In contrast, our time dimension is 59 months and our group dimension is 50 states. Because of our long time dimension we have too many instruments. When we attempt to use the GMM Arellano-Bond estimator for our differenced model, we get a perfect Hansen over-identification test p-value of one.²² Roodman (2009b) notes that this often occurs when there are more instruments than groups. This large number of instruments leads to a singularity error when the covariance matrix of moments required for the Hansen test is estimated. Despite our many attempts, this problem is not solved by reducing the set of instruments used or by collapsing instruments. Since the Hansen test tests for instrument proliferation, a problem whereby the endogenous variable is overfit and endogenous components are not removed, it is crucial to have this test result. So we also do not present results using the Arellano and Bond (1991) approach here.

The second analysis we did was to estimate regression models for the hiring credits dummy variables, including the same controls as in Table 5, as well as long lags of the first differences of log employment (up to 36 months). We did this for the credits corresponding to what are perhaps the two most interesting findings in Table 5 – the positive effect of hiring credits that allow recapture of credits, and the positive effect of credits targeting the unemployed. We found no evidence that the adoption of these kinds of credits were positively associated with past growth in employment – precisely the kind of

²² We used `xtabond2` in Stata (see Roodman, 2009a),

“pre-trend” that could generate spurious evidence of positive effects of these kinds of credits. The effects of lagged employment growth were generally negative, and almost always statistically insignificant²³).

Counts of Hiring Credits

Table 7 reports estimates of the same specifications as in Table 5, with the difference that the hiring credits variables are counts of the number of credits with a particular feature, rather than dummy variables for the presence of a credit with a particular feature. As there are often multiple credits with a particular feature, there is more variation in these credit count variables. However, as noted earlier, this variation may not be substantive if the addition of credits of a type that already exist in a state does little to change behavior. To a large extent, the estimates in Table 7 are similar to those in Table 5. We still find some evidence of positive and significant effects on employment growth of credits based on investment, of refundable credits (to some extent), and of credits targeting the unemployed. There are two main differences, though. First, there is now also evidence of positive effects of credits for full-time jobs, and second, there is no longer evidence of positive effects of credits allowing recapture.

Incorporating the HIRE Act

Our next extension is to include the federal HIRE Act as part of the set of hiring credits whose effects we estimate. As indicated in Table 4, the HIRE Act effectively switches on hiring credits with many types of features (e.g., benefits based on payroll, targeting the unemployed) in many states – all the states that did not have these types of credits prior to the HIRE Act. The estimates, reported in Table 8, for the most part do not change. The one substantive change is for the targeting of the unemployed, which the HIRE Act did, as the positive and significant effects of this type of credit reported in Tables 5 and 6 now becomes small and insignificant. One possible explanation for this is that the HIRE Act was a low-value credit, with a maximum of \$1,000 per worker hired.

To explore this further, in Table 9 we report estimates for the effects of hiring credits targeting the unemployed, distinguishing between those with a value of up to \$1,000, and more than \$1,000. If we find a positive effect of the higher-value credits, which would suggest that the smaller effect of hiring

²³ We did this analysis for the specifications in Table 5, as well as other sample periods and forms of the credit variable discussed below; the results were the same as those discussed here. Results are available from the authors upon request.

credits targeting the unemployed once we include the HIRE Act could be attributable to its low value. However, as reported in the left-hand panel of Table 9, for state hiring credits targeting the unemployed, the estimated effect of low-value credits is actually larger, although the estimates for both low- and high-value credits are generally statistically significant, at least for some period. Note, however, that the effect of the low-value credit in this case is identified from only one state (last panel of Table 4). In the right-hand panel, we add in the HIRE Act, again distinguishing by value. The estimates for the high-value credits are similar to those in the right-hand panel, while the estimates of the low-value credits are insignificant (and small and negative). At the end of the day, then, the HIRE Act does not appear to have been effective, although we cannot really tell whether this was because it was a low-value credit, or because of some other features that diminished its effectiveness. One possibility is that the HIRE Act extended hiring credits to states where they were likely to be less effective, which could be why those states had not adopted them earlier.

Extending the Sample Period

The analysis to this point has focused on the period of the Great Recession, because the main empirical question this paper addresses concerns the effects of hiring credits adopted during that period. However, as Table 4 showed, not many credits of the different types we considered were adopted during or just after the Great Recession. It therefore seems worthwhile to ask what we can learn about the effect of hiring credits by extending the sample period to include earlier years. To that end, Table 10 reports results incorporating earlier years. We first extend the sample back to 1995, which is when the data on UI benefits extensions begin, and then back to 1990, which also captures the recession of the early 1990s. In the latter case we do not have the UI benefits extension data, but we verified that excluding the control based on these data for the 2007-2011 period does not impact the results. We estimated the same models shown in Table 5, but we report results only for the key coefficients from the key specifications for which we found significant effects of hiring credits; this does not give a misleading view of the evidence from these longer sample periods because in the fuller set of estimates we did not find significant evidence of other types of credits.

The first two columns repeat these key estimates from Table 5, and the next two columns report the corresponding estimates for 1995-2011. The next column shows the number of additional states where such credits were introduced over the longer sample period relative to the 2007-2011 period. Overall, 17 additional states introduced any hiring credit, and quite a few introduced credits based on investment, credits for full-time jobs, refundable credits, and credits allowing for recapture. In contrast – unfortunately – we get almost no additional information on credits targeting the unemployed, as only one additional state introduced such a credit in the longer sample period. The last three columns report the same kind of information for the 1990-2011 period; in this case the additional credits are also relative to the 2007-2011 period. Aside from the longer sample period and the absence of the UI benefit extension controls for the 1990-2011 period, the only difference is that the cyclical control is now calculated using 1990 as the baseline year.

Some of the estimates for the two longer sample periods are similar. For credits based on investment, the point estimates remain positive, but are statistically insignificant. The negative effects of credits based on full-time-equivalent employment remain negative and sometimes statistically significant. The evidence of a positive effect of refundable hiring credits is now a bit stronger, and there is still some evidence of positive and statistically significant effects of credits that can be recaptured. Perhaps the biggest and most substantively interesting difference is that there is no longer any evidence of positive effects of hiring credits targeting the unemployed. Then again, we only get one additional such credit extending the sample back to 1995, and one more extending it to 1990 (relative to four states adopting such credits in the 2007-2011 period); one of these was adopted in 1992, and one in 1997. Thus, it appears reasonable still to conclude that hiring credits targeting the unemployed enacted during or after severe recessions are effective in increasing job growth, although the evidence still comes from relatively few states.

Employment vs. Hiring

As noted earlier, one potential problem with hiring credits is that they can lead firms to churn workers, earning more credits for hiring (and firing) workers that preserve a given level of employment

(or a given growth rate) than with less hiring and firing. We have already established some evidence of positive employment effects, so there is no reason to believe that the hiring credits we study generate *only* churning, with no change in employment. However, whether or not hiring credits generate a lot of churning is still an important policy question because it can drive up the costs of using hiring credits, per job created – a phenomenon referred to as “windfalls” to employers from hiring credits.

By using data from the Quarterly Workforce Indicators (QWI), we can learn something about churning, because these data allow measurement of employment, as well as hiring.

The QWI data also have information on separations, but the Job Openings and Labor Turnover Survey (JOLTS) data show that quits are generally more than 50 percent of separations, although of course less so during and after the Great Recession, when layoffs and discharges rose.²⁴ Given that we cannot separate out involuntary separations that firms could use, along with hiring, to increase windfalls, we present evidence only on hiring (and employment in the QWI, for comparability).

The QWI data are derived from the Longitudinal Employer-Household Dynamics (LEHD) Program at the U.S. Census Bureau. The employer and workplace reports are the same as the data reported to the BLS as part of the QCEW. Yet, due to methodological differences, the two sources are not exactly equal. Moreover, by using the linked employer information in the LEHD, accessions of workers to new employers, and separations from those employers, can be observed. Beginning of period employment is conceptually and empirically similar to QCEW month one employment. Formally, a person is defined as employed at the beginning of a quarter when he has positive earnings with the same employer in both the previous and current quarters. Hires are recorded when an individual has positive earnings with a particular employer in the current quarter and not in the previous one.²⁵ Finally, separations are defined to occur when an individual has positive earnings in the current quarter but either no earnings with the same employer or positive earnings with another employer in the next quarter.²⁶

²⁴ See <http://research.stlouisfed.org/fred2/categories/32241> (viewed February 11, 2013).

²⁵ There is also a “new hiring” variable defined when an individual has positive earnings in the current quarter, with no earnings from the same employer during the previous four quarters, but here we use the “all hiring” measure.

²⁶ See http://lehd.ces.census.gov/library/techpapers/QWI_definitions.pdf (viewed February 12, 2013).

The model is the same as the one used for the monthly data, but now the time unit is a quarter, and this entails some modifications. We use as dependent variables the first difference of the log of: 1) employment (number of jobs) at the beginning of the quarter; 2) the number of workers who started a new job in the quarter; and 3) the number of workers who separated in the quarter. The specification includes the first difference and 4 lags of the variable capturing the existence of a job credit (or of a credit with a particular feature). This variable is constructed from the monthly dummies and is equal to 1/3, 2/3, and 1 if the credit (or a credit with a particular feature) is present in a state for 1, 2, or 3 months in a given quarter. It also includes the first difference of the log of the state-specific shock variable and 4 lags. This variable is constructed as the average of the monthly shock variables in each quarter. The specification also includes interactions of the first difference of the shock variable with state dummy variables; first differences and 4 lags of the minimum wage prevailing in the state at the beginning of the quarter; first difference and 4 lags of the control for extended UI benefits; dummy variables for each quarter in the sample; and interactions between calendar quarter dummy variables and state dummy variables.

The results for employment and hires are reported, respectively, in Tables 11 and 12. Some of the employment results are quite comparable to Table 5, which is not surprising, since these represent the same fundamental data source, but with the data and specification at the quarterly level. Most important, perhaps, there is quite strong evidence of positive effects of credits that allow for recapture, and credits that target the unemployed. There is also still evidence of negative effects of hiring credits targeting manufacturing.

Table 12 turns to hires. To some extent these results reflect the employment results. In particular, credits allowing recapture and credits targeting the unemployed have large and significant positive effects. In both cases, the positive estimates are about ten times as large as the effects on employment overall, suggesting that there may be considerably churning generated by these credits.²⁷

There is also some evidence of positive effects of particular types of hiring credits on hiring for which there was no evidence of positive effects on employment growth. This is the case for refundable

²⁷ We interpret the positive hiring effects as reflecting churning, which is only one part of potential windfalls. To the extent that hiring credits end up rewarding hiring that would have occurred anyway – another part of windfalls – we would not expect to see any effect of credits.

credits, only in the very short term. Interestingly, in light of the negative effect on employment growth of credits targeting manufacturing, here we find evidence of strong positive effects. And there is also some evidence of positive effects of credits targeting the disabled (again, only in the very short term).²⁸ These latter results are consistent with credits leading to churning that spurs hiring but does not generate employment growth, which can imply that a good share of state spending on hiring credits takes the form of windfalls to employers.

VI. Conclusions

State and federal policymakers grappling with the aftermath of the Great Recession have sought ways to spur job creation, in many cases adopting hiring credits for that aim to induce employers to create new jobs. This paper provides new evidence on the effects of state hiring credits on job growth, focusing in particular on the influence of credits adopted during and after the Great Recession.

We find evidence that specific types of hiring credits succeeded in boosting employment. These include credits whose benefits were based on investment, credits that measured the jobs on which they were based in terms of part-time employment, credits that are refundable (with only weak evidence), credits that allow for recapture of payments if the required goals were not met, and credits targeting the unemployed.

This evidence comes from state hiring credits. When we also look at the federal HIRE Act, which provides additional identifying information on credits targeting the unemployed, the evidence on the effectiveness of such credits goes away. This may be because the HIRE Act offered a meager credit, although the data are not sufficient to be able to determine this.

There are some limitations to what can be learned about the effects of credits enacted in this period. Because the window is relatively short, the number of credits enacted is not large, so that the identifying information often comes from a small number of states. In addition, there are many types of credits, and we are therefore interested in trying to estimating which kinds of features of credits make

²⁸ We also find evidence that credits based on full-time employment boost hiring. For these types of credits, we have tended not to find a positive effect on employment growth, except in Table 7 which uses a count of credits.

them more effective. Given these limitations, and given the dearth of other evidence on the effects of hiring credit programs, the findings must be interpreted cautiously.

Nonetheless, the results do provide some evidence that particular types of hiring credits may have boosted job growth during the Great Recession and its aftermath. Moreover, some of the results are consistent with what we might expect. Hiring credits based on part-time employment would be expected to do the most to increase the number of people employed (even if policymakers might prefer to create full-time jobs). A refundable hiring credit ought to have the greatest impact on firms because it is valuable even if the firm does not have taxable income. Recapture provisions should make hiring credits more effective. And finally credits targeting the unemployed, especially during a period such as the Great Recession when unemployment should not be a stigmatizing characteristic, should be more effective. At the same time some expectations are not borne out in the data. Perhaps most significantly, we do not find a stronger positive effect (or indeed any positive effect) of temporary hiring credits, although as we have explained it is very difficult to determine whether a hiring credit was perceived as temporary by employers. All in all, though, the results provide some evidence that judiciously chosen hiring credits adopted during the Great Recession did help increase job growth.

There is also some evidence justifying the concern that hiring credits generate windfalls for employers who can churn employees, generating a lot more gross hiring than net employment growth. As discussed in Neumark (2013), estimates from the existing literature point to windfall rates that could be near 90 percent – that is, for every 10 hires for which hiring credits are paid, 1 net job is created. Nonetheless, windfall rates this high can still be consistent with costs per job created in the United States in the \$30,000 or \$40,000 range, and perhaps much lower. Such costs are substantially below – perhaps only 1/7th as high – the costs of creating jobs through the fiscal stimulus in the form of the American Recovery and Reinvestment Act (ARRA). And the evidence gives a little guidance as to the kinds of features of hiring credits likely to make them effective – including targeting the unemployed (perhaps especially in the aftermath of a severe recession), allowing recapture of credits when jobs are not created,

and – although the evidence is weaker on this point – making the credits refundable so they are of value to firms even if the credits exceed tax liabilities.

All in all, the evidence is not overwhelming that hiring credits should be an important part of the policy response to the Great Recession, or to future severe recessions. But there is some evidence pointing in this direction, especially for particularly types of hiring credits. Given these findings, there may be merit to enacting legislation establishing federal or state hiring credits that turn on automatically and aggressively when economic downturns occur. Such credits would complement other “automatic stabilizers” that seek to provide a boost to workers’ and families’ incomes when a recession occurs, such as Unemployment Insurance, welfare, and progressive taxation. Such proactive legislation could represent a substantial improvement over what happened during the Great Recession, when some states (and the federal government) debated the adoption of hiring credits in the middle or near the end of the recession, and, facing the budgetary difficulties attributable to the recession that had already set in, sometimes enacted poorly funded or narrowly-targeted hiring credits.²⁹

²⁹ For example, California’s New Jobs Credit, enacted in 2009, targets small businesses generally, rather than the disadvantaged or the unemployed, and did not result in a large amount of hiring credits being claimed.

References

- Anderson, T. W., and Cheng Hsiao. 1982. "Formation and Estimation of Dynamic Models Using Panel Data." *Journal of Econometrics*, Vol. 18, No. 1, January, pp. 47-82.
- Arellano, Manuel, and Stephen Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies*, Vol. 58, No. 2, April, pp. 277-297.
- Bartik, Timothy J. 2001. Jobs for the Poor: Can Labor Demand Policies Help? New York: Russell Sage Foundation.
- Bartik, Timothy J., and John H. Bishop. 2009. "The Job Creation Tax Credit: Dismal Projections for Employment Call for a Quick, Efficient, and Effective Response." Economic Policy Institute Briefing Paper No. 248, Washington, DC, October 20.
- Bartik, Timothy J., and George Erickcek. 2010. "The Employment and Fiscal Effects of Michigan's MEGA Tax Credit Program." Upjohn Institute Working Paper No. 10-164.
- Bishop, John. 2008. "The 1977-78 New Jobs Tax Credit Was a Big Success. Can a Tax Credit for Employment Growth in 2009 and 2010 Restore Animal Spirits and Help Jump Start the Economy." Cornell University, <http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1185&context=articles> (viewed December 21, 2010).
- BLS & Co. n.d. *State Economic Development Incentives and Demographic Profiles*. Available at <http://www.blsstrategies.com/state-incentives> (viewed June 12, 2012).
- Burtless, Gary. 1985. "Are Targeted Wage Subsidies Harmful? Evidence from a Wage Voucher Experiment." *Industrial and Labor Relations Review*, Vol. 39, No. 1, October, pp. 105-14.
- Business Facilities. n.d. *States Incentives Guide*. Available at <http://businessfacilities.com/special-report/2011-incentives-guide/> (viewed June 12, 2012).
- Cameron, A. Colin, Jonah B. Gelbach, and Douglas L. Miller, Douglas L. 2008. "Bootstrap-Based Improvements for Inference with Clustered Errors." *Review of Economics and Statistics*, Vol. 90, No. 3, August, 414-427.
- Chirinko, Robert S., and Daniel J. Wilson. 2010. "Job Creation Tax Credits and Job Growth: Whether, When, and Where?" Federal Reserve Bank of San Francisco Working Paper 2010-25.
- Dickert-Conlin, Stacy, and Douglas Holtz-Eakin. 2000. "Employee-Based Versus Employer-Based Subsidies to Low-Wage Workers: A Public Finance Perspective." In David E. Card and Rebecca M. Blank, eds., Finding Jobs: Work and Welfare Reform. New York: Russell Sage Foundation, pp. 262-94.
- Elsby, Michael, Bart Hobijn, and Aysegul Sahin. 2010. "The Labor Market in the Great Recession." Unpublished manuscript, Brookings Institution.
- Fahey, Jennifer Campbell, Janine E. Kaczmarowski, and Dorothy Krauss. 1997. "States Use Several Methods to Attract and Retain Business." *Journal of State Taxation*, Vol. 16, No. 1, Summer, pp. 45-78.
- Farber, Henry, and Robert Valletta. 2011. "Extended Unemployment Insurance and Unemployment Duration in the Great Recession: The U.S. Experience." Unpublished manuscript.

Görg, Holger, and Aoife Hanley. 2005. "Labour Demand Effects of International Outsourcing: Evidence from Plant-Level Data." *International Review of Economics and Finance*, Vol. 14, No. 3, pp. 365-376.

Gugler, Klaus, and B. Burcin Yurtoglu. 2004. "The Effects of Mergers on Company Employment in the USA and Europe." *International Journal of Industrial Organization*, Vol. 22, No. 4, April, pp. 481-502.

Hollenbeck, Kevin M., and Richard J. Willke. 1991. "The Employment and Earnings Impact of the Targeted Jobs Tax Credit." Upjohn Institute Staff Working Paper 91-07, Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Holtz-Eakin, Douglas, Whitney Newey, and Harvey S. Rosen. 1988. "Estimating Vector Autoregressions with Panel Data." *Econometrica*, Vol. 56, No. 6, November, pp. 1371-1395.

Katz, Lawrence F. 1998. "Wage Subsidies for the Disadvantaged." In Richard B. Freeman and Peter Gottschalk, eds., Generating Jobs: How to Increase Demand for Less-Skilled Workers. New York, NY: Russell Sage Foundation, pp. 21-53.

Martínez-García, Enrique, and Janet Koech. 2010. "A Historical Look at the Labor Market During Recessions." *Economic Letter*, Federal Reserve Bank of Dallas, Vol. 5, No. 1, January.

Mattera, Philip, Thomas Cafcas, Leigh McIlvaine, Andrew Seifter, and Kasia Tarczynska. 2011. *Money for Something: Job Creation and Job Quality Standards in State Economic Development Subsidy Programs*, Good Jobs First, available at <http://www.goodjobsfirst.org/sites/default/files/docs/pdf/moneyforsomething.pdf> (viewed Nov. 5, 2012).

National Association of State Development Agencies. 1983. *Directory of Incentives for Business Investment and Development in the United States: A State-By-State Guide*, 1st ed. Washington D.C.: The Urban Institute Press.

National Association of State Development Agencies. 1986. *Directory of Incentives for Business Investment and Development in the United States: A State-By-State Guide*, 2nd ed. Washington D.C.: The Urban Institute Press.

National Association of State Development Agencies. 1991. *Directory of Incentives for Business Investment and Development in the United States: A State-By-State Guide*, 3rd ed. Washington D.C.: The Urban Institute Press.

National Association of State Development Agencies. 2003. *State by State Guide to Incentives for Business Investment and Development*. Austin: Summers Press.

Neumark, David. 2013. "Spurring Job Creation in Response to Severe Recessions: Reconsidering Hiring Credits." *Journal of Policy Analysis & Management*, Vol. 32, No. 1, pp. 142-71.

Perloff, Jeffrey M., and Michael L. Wachter. 1979. "The New Jobs Tax Credit: An Evaluation of the 1977-78 Wage Subsidy Program." *American Economic Review Papers and Proceedings*, Vol. 69, No. 5, pp. 173-179.

Pittelko, Brian. 2011. "Trends in States' Unemployment Rates." The Upjohn Institute Blog, April 22. Available at <http://www.upjohninst.org/blog> (viewed April 26, 2011).

Rogers, Cami. 1998. "State Guidelines: The Jobs Creation Tax Credit." *Journal of State Taxation*, Vol. 16, Winter, pp. 44-63.

Roodman, David M. 2009a. "How to Do xtabond2: An Introduction to Difference and System GMM in Stata." *The Stata Journal*, Vol. 9, No. 1, pp. 86-158

Roodman, David M. 2009b. "A Note on the Theme of Too Many Instruments." *Oxford Bulletin of Economics and Statistics*, Vol. 71, No. 1, February, pp. 135-158.

Rothstein, Jesse. 2011. "Unemployment Insurance and Job Search in the Great Recession." *Brookings Papers on Economic Activity*, Fall, pp. 143-213.

Sierra Group. n.d. *Employment Incentives*. Available at http://www.employmentincentives.com/state_incentives/state_incentives_intro.htm. (viewed June 12, 2012).

State Capital Group. 2010. *Incentives for Businesses 50 State Handbook*. Available at http://www.statecapitalgroup.org/newspublications/businessincentives/BusinessIncentives2010_Final.pdf (viewed June 16, 2012).

Figure 1: Total Number of States with Hiring Credit Programs at Any Time, 1969-June, 2012

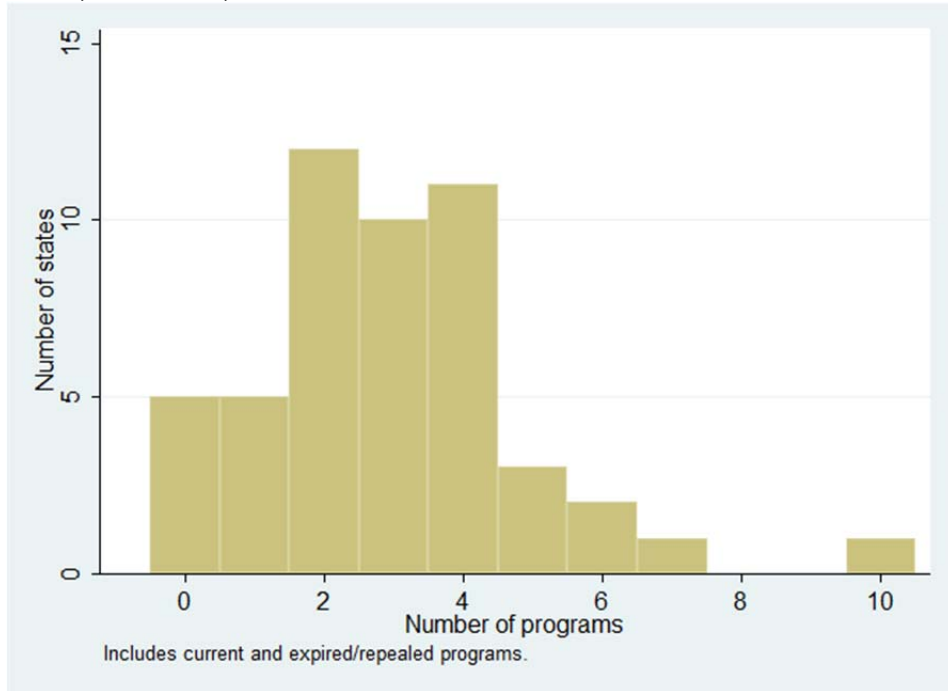


Figure 2: Number of Programs Created Each Year

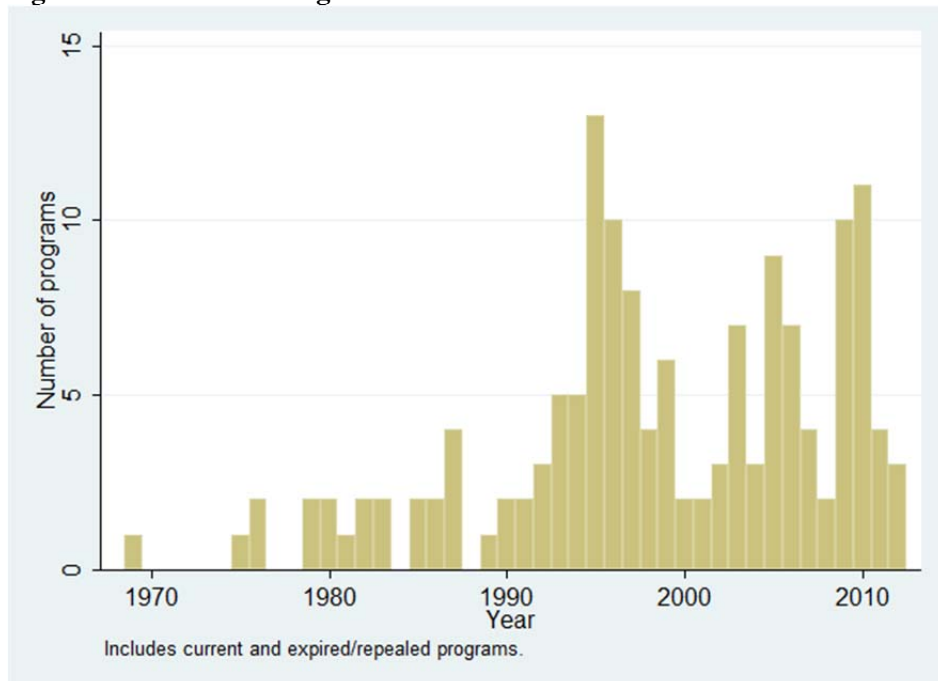


Table 1: Summary of State Hiring Programs, 1969-June, 2012

A. States	
States analyzed	50
1 or more hiring credits	45
No hiring credit	5
B. Basic information	
Total number of hiring credit programs	147
Creation date	
1969-1979	6
1980-1989	16
1990-1999	58
2000-before Great Recession	37
During Great Recession	9
After Great Recession	21
During sample period (2007-2011)	31
Current at June 2012	121
Duration of hiring credit programs	
0-10 years	73
11-20 years	53
21-30 years	13
31+ years	8

Table 2: Definition of Variables and Coding State Hiring Credits

Variable	Categories	Description
Initial date: <i>Starting date of the program. The first month in which the program is effective, i.e., for which economic benefits are provided for new hiring.</i>		
Final date: <i>The month in which the program expired, was repealed or replaced. If none of these the program is effective (current).</i>		
Years of program: <i>Duration of the program in years from the initial date until June, 2012.</i>		
Temporary/permanent: <i>The program is originally enacted as temporary, permanent, or undetermined/not determinable. The classification is assumed to be a feature of each program throughout its duration.</i>	Temporary	<i>The original act provides a specific date when the program ends.</i>
	Permanent	<i>The original act does not provide any date for the program to end.</i>
	Undetermined/ not determinable	<i>The original act specifies an undetermined end date, or it is not possible to determine whether the program is temporary or permanent.</i>
Type of benefit provided: <i>Form in which the program provides economic benefits.</i>	Tax credit	<i>Economic benefit is provided as a credit against the firm's tax liability (income, corporate or sales tax).</i>
	Grant	<i>Economic benefit is provided as a direct payment to the firm.</i>
Eligibility requirements: ^a <i>The basic classification of programs. Refers to the firm's requirements needed to obtain the economic benefits of the program.</i>	Jobs	<i>Requires creation of new jobs.</i>
	Payroll	<i>Requires payroll increments.</i>
	Investment	<i>Requires new investment.</i>
	Other	<i>Requires other factors (e.g., costs of new facility, building area of an expansion).</i>
Basis for providing benefits: ^a <i>Criterion based on which the value of the economic benefit provided by the program is calculated.</i>	New jobs	<i>Benefit is based on the number of net new employees.</i>
	New payroll	<i>Benefit is based on new payroll (wages paid to new employees, withholdings of new employees).</i>
	New investment	<i>Benefit is based on new investment in machinery, property, facilities, equipment or any growth-related assets.</i>
	Other criteria	<i>Benefit is based on other criteria (property tax, sales tax, excise tax).</i>
Value per job created: <i>The average value of the economic benefit that a firm received from the program, normalized to one full-time job maintained for one year. When programs assign different values for different provisions (e.g., jobs created in different county</i>		<i>Value is less than or equal to \$1,000.</i>
		<i>Value is greater than \$1,000.</i>
	Discretionary	<i>Value is determined by the agency that administers the program.</i>
	Not determinable	<i>Value is not possible to estimate</i>

Variable	Categories	Description
<i>tiers, jobs with higher wages), each value is assigned the same weight.</i>		<i>because it depends on some unknown variable (e.g., firm's paid ad-valorem tax).</i>
<p>Limitations to the program's benefits:</p> <p><i>Form in which the program limits the economic benefits provided for each taxable year.</i></p>	Equal tax owed	<i>The maximum benefit that can be paid to a firm is the firm's tax liability. If the value of the benefit exceeds the firm's tax liability, this excess is not paid.</i>
	Carry-forward	<i>If the value of the benefit exceeds the firm's tax liability (or a specific percentage of it) for the taxable year, this excess may be carried forward to succeeding years and be used as a credit against the firm's tax liability.</i>
	Refundable	<i>The whole benefit is paid even if it is higher than the value of the firm's tax liability.</i>
	Not specified	<i>No limit is specified for the benefit that can be paid.</i>
<p>Type of new jobs required:</p> <p><i>The type of job the firm needs to create to obtain the benefits of the program. The type of job is defined by the minimum number of hours of work performed per week.</i></p>	Full-time	<i>New employee works for 30 or more hours per week.</i>
	Full-time equivalent	<i>One or more new employees work a number of hours per week that summed up result in one full-time employee's hours requirement.</i>
	Part-time	<i>New employee works at least 10 hours per week. Not that by definition this also includes full-time employees.</i>
	Not specified	<i>No required number of hours is specified.</i>
<p>Targeted by type of industry:</p> <p><i>Program applies only to some industries</i></p>	Targeted	<i>Program applies to a cluster of industries.</i>
	Manufacturing	<i>Program applies to manufacturing facilities.</i>
	Not targeted	<i>Program applies to all industries.</i>
<p>Targeted by type of business:</p> <p><i>Program applies only to certain types of businesses</i></p>	Small business	<i>Program applies to firms with 50 employees or less.^b</i>
	Large business	<i>Program applies to firms with a large number of employees, high job creation, payroll, and/or investment broadly defined.</i>
	Headquarters	<i>Program applies to those facilities where the principal offices of an eligible business are located.</i>
	Not targeted	<i>Program applies to all types of businesses.</i>

Variable	Categories	Description
<p>Targeted by type of worker:</p> <p><i>Program applies only to certain type of workers.</i></p>	Disabled	<i>Program applies to disabled workers, i.e. Individuals who are considered to have a physical or mental disability which results in a substantial handicap to employment. This disability may be determined or certified by specific institutions such as the Division of Rehabilitation Services.</i>
	Unemployed	<i>Program applies to the unemployed, i.e., individuals who attest not to be working and who have received unemployment compensation benefits and/or have been classified as unemployed by a competent office of employment.</i>
	Welfare recipients	<i>Program applies to recipients of welfare aid, e.g., Temporary Assistance for Needy Families.</i>
	Not targeted	<i>Program applies to all workers.</i>
<p>Recapture provisions:</p> <p><i>Program has specific provisions (e.g. penalties) if the requirements to access the benefits were not properly followed and/or maintained.</i></p>	Yes	
	No/not specified	
<p>Wage requirements:</p> <p><i>Firms must pay specific wages to the new and/or retained employees. The wages may be defined as a specific amount of money, county, state or federal minimum wages, or payments at or above specific percentages of some relevant average wage (e.g., county, state).</i></p>	Yes	
	No	
<p>Geographic provisions:</p> <p><i>Program provides different benefits based on a geographic consideration within the state (e.g. county tiers)</i></p>	Yes	
	No	

^a The classification for this variable is not mutually exclusive.

^b In Virginia, a small business is defined as a company with less than 250 employees.

Table 3: Characteristics of State Hiring Credit Programs, 1969-June, 2012

Type of Credit	Count	Type of Credit	Count
General classification		Job creation required	
Temporary/permanent		Full-time jobs	90
Temporary	44	Full-time equivalent jobs	24
Permanent	97	Part-time jobs	11
Undetermined/cannot be determined	6	Unspecified	22
Form of program		Targeting	
Tax credit	123	Non-targeted	75
Grant	24	Targeted	72
Eligibility requirements		By firm's characteristics ^a	
Jobs	143	Industry dependent	33
Jobs only	64	Type dependent	20
Payroll	7	Large business	6
Investment	61	Small business	8
Other requirements	19	Headquarters	6
Benefits of program		By employee's characteristics ^a	
Basis for benefits^a		Unemployed	
New jobs	110	Disadvantaged	10
New jobs only	48	Welfare recipients	7
New payroll	66	Recapture provisions	
New payroll only	20	Specific recapture provisions	54
New investment	29	Job requirements	
Other criteria	28	Wage requirement	83
Value per job created (\$, estimated)		Within-state geographic variation	
≤1,000	24	Special provisions for disadvantaged regions	48
>1,000	78		
Discretionary	22		
Cannot be determined	23		
Limitations to the program's benefits^a			
Tax credit is equal to tax owed	21		
Carry-forward is allowed	68		
Refundable (the whole value of the credit is paid even if it is higher than the value of the tax owed)	17		
Not specified	43		

^a The classification for this variable is not mutually exclusive.

^b The value of the credit is determined as a percentage of a corporate tax (e.g., property tax credits, sales and use tax credits) or some other criterion like e.g. square footage of the property used.

Table 4: Changes in States with Specific Types of Credits, 2007-2011

							Changes Due to HIRE Program	
	2006	2007	2008	2009	2010	2011	2010	2011
Any Credit	0	0	0	2	0	0	5	5
Jobs	1	1	0	2	0	0	7	7
Payroll	2	1	0	3	1	2	18	18
Investment	0	1	0	0	1	0	0	0
Other	1	0	0	0	1	0	0	0
Full Time	0	0	0	3	1	0	0	0
Full Time Equiv.	0	2	1	1	2	1	0	0
Part Time	2	0	0	0	0	0	0	0
Not Specified	1	0	0	1	0	0	37	37
Equal to Tax Owed	1	0	1	1	0	1	24	23
Carry-forward	1	0	0	3	0	0	0	0
Refundable	0	1	0	0	2	2	0	0
Not Specified	1	0	1	3	2	2	0	0
Wage Requirement	1	1	0	3	1	0	0	0
No Wage Requirement	3	0	1	2	0	3	21	21
Recapture	0	1	0	1	2	1	0	0
No Recapture	2	0	0	3	1	1	16	16
Industry	0	1	0	1	0	1	0	0
Manufacturing	0	0	0	0	1	0	0	0
No Targeting	0	0	0	2	1	0	9	9
Unemployed	0	0	0	0	3	1	46	44
Welfare Recipient	0	0	0	0	0	0	0	0
Disabled	2	0	0	0	1	0	0	0
No Targeting	0	0	0	2	0	0	0	0
Temporary	3	0	2	0	6	3	30	27
Permanent	1	0	0	2	0	2	0	0
Undeterminable	0	0	0	0	0	0	0	0
≤ \$1000	2	0	0	0	1	3	33	32
> \$1000	0	2	0	4	4	1	0	0
Discretionary	0	1	0	0	0	0	0	0
Not Determinable	1	0	1	0	1	1	0	0
<hr/>								
<i>Restricted to credits targeting unemployed:</i>								
≤ \$1000	0	0	0	0	1	0	47	46
> \$1000	0	0	0	0	2	1	0	0
Discretionary	0	0	0	0	0	0	0	0
Not Determinable	0	0	0	0	0	0	0	0

There are more entries in the last two columns of the last panel, for low-value credits targeting the unemployed, because this row counts credits that both target the unemployed and are low value. There are fewer entries four rows above, for low-value credits generally, because when the HIRE Act took effect, if there was already a low-value credit that did not target the unemployed, then the state is not coded as adding a low-value credit.

Table 5: Estimated Effects of State Hiring Credits on Employment, Credit Dummy Variables Specifications, First Differences, 2007-2011

Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags	Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags
Credit	0.0009 (0.0016)	-0.0006 (0.0019)	-0.0054 (0.0049)	-0.0047 (0.0039)	Wage Requirement	-0.0016 (0.0016)	0.0014 (0.0033)	0.0018 (0.0048)	0.0001 (0.0050)
Jobs	0.0012 (0.0014)	-0.0005 (0.0017)	-0.0038 (0.0044)	-0.0041 (0.0042)	No Wage Requirement	-0.0012 (0.0028)	-0.0025 (0.0041)	-0.0048 (0.0056)	-0.0082 (0.0106)
Payroll	-0.0010 (0.0011)	-0.0011 (0.0018)	-0.0018 (0.0036)	-0.0040 (0.0029)	Recapture	0.0036 (0.0025)	0.0068 (0.0027)	0.0096 (0.0017)	0.0121 (0.0031)
Investment	0.0108 (0.0008)	0.0082 (0.0014)	0.0074 (0.0031)	0.0087 (0.0034)	No Recapture	0.0022 (0.0009)	-0.0012 (0.0028)	-0.0043 (0.0026)	-0.0046 (0.0025)
Others	0.0010 (0.0008)	0.0030 (0.0011)	0.0040 (0.0014)	0.0056 (0.0020)	Industry	0.0007 (0.0008)	0.0006 (0.0028)	-0.0007 (0.0046)	-0.0040 (0.0048)
Full Time	0.0012 (0.0009)	0.0019 (0.0023)	0.0008 (0.0048)	0.0025 (0.0065)	Manufacturing	0.0000 (0.0009)	-0.0062 (0.0013)	-0.0054 (0.0020)	-0.0067 (0.0024)
Full Time Equiv.	-0.0053 (0.0017)	-0.0065 (0.0020)	-0.0062 (0.0046)	-0.0126 (0.0065)	No Targeting	0.0019 (0.0012)	0.0018 (0.0024)	-0.0028 (0.0040)	-0.0021 (0.0035)
Part Time	...	...	-0.0004 (0.0008)	0.0069 (0.0013)	Unemployed	0.0047 (0.0018)	0.0066 (0.0011)	0.0074 (0.0028)	0.0108 (0.0042)
Not Specified	0.0013 (0.0005)	-0.0009 (0.0008)	-0.0052 (0.0014)	-0.0077 (0.0016)	Disabled	-0.0108 (0.0010)	-0.0020 (0.0012)	0.0000 (0.0021)	0.0004 (0.0042)
Equal to tax owed	-0.0048 (0.0016)	-0.0049 (0.0054)	-0.0075 (0.0069)	-0.0219 (0.0144)	No Targeting	0.0008 (0.0016)	-0.0008 (0.0019)	-0.0056 (0.0050)	-0.0051 (0.0040)
Carry-forward	0.0015 (0.0010)	0.0009 (0.0062)	-0.0031 (0.0070)	-0.0030 (0.0086)	Temporary	-0.0019 (0.0020)	-0.0034 (0.0023)	-0.0035 (0.0032)	-0.0054 (0.0059)
Refundable	0.0013 (0.0026)	0.0012 (0.0028)	0.0045 (0.0029)	0.0032 (0.0043)	Permanent	0.0007 (0.0010)	0.0002 (0.0023)	-0.0011 (0.0041)	-0.0004 (0.0037)
Not Specified	0.0024 (0.0019)	0.0007 (0.0035)	0.0004 (0.0042)	0.0011 (0.0045)					

The dependent variable is the first difference of the log of employment. The specification includes the first difference of the job credit dummy or dummies, and of 12 lags. In addition to the contemporaneous effect, the cumulative effects through 4, 8, and 12 lags are reported in the table. Each panel reports a different specification. The first just includes a single dummy variable for whether there is a credit, the second includes dummy variables for whether there is a credit with each of the four possible requirements, etc. In some cases the effect of a particular type of credit shown in Table 2 could not be identified because of a lack of variation in the sample period; in some cases only some of the lagged effects could be identified. The specification also includes: the first difference of the state-specific shock variable(in logs) and 12 lags of this variable; interactions of the first difference of the shock variable interacted with state dummy variables; first differences and 12 lags of the log of the minimum wage prevailing in the state; first differences and 12 lags of the control for extended UI benefits; dummy variables for each month in the sample; and interactions between calendar month dummy variables and state dummy variables. The data are monthly. There are 2,950 observations. Standard errors, reported in parentheses, are clustered at the state level.

Table 6: Specifications Adding Lagged First Difference of Log Employment (Dependent Variable)

Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags	Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags
Credit	0.0008 (0.0017)	-0.0007 (0.0019)	-0.0059 (0.0052)	-0.0052 (0.0043)	Wage Requirement	-0.0015 (0.0015)	0.0015 (0.0036)	0.0022 (0.0053)	0.0003 (0.0055)
Jobs	0.0012 (0.0014)	-0.0007 (0.0019)	-0.0045 (0.0047)	-0.0046 (0.0046)	No Wage Requirement	-0.0011 (0.0029)	-0.0027 (0.0045)	-0.0052 (0.0062)	-0.0089 (0.0113)
Payroll	-0.0011 (0.0011)	-0.0014 (0.0019)	-0.0019 (0.0040)	-0.0045 (0.0033)	Recapture	0.0036 (0.0026)	0.0074 (0.0030)	0.0110 (0.0018)	0.0135 (0.0034)
Investment	0.0110 (0.0008)	0.0084 (0.0016)	0.0081 (0.0031)	0.0096 (0.0038)	No Recapture	0.0023 (0.0010)	-0.0013 (0.0029)	-0.0045 (0.0027)	-0.0050 (0.0027)
Others	0.0008 (0.0008)	0.0029 (0.0012)	0.0042 (0.0016)	0.0055 (0.0021)	Industry	0.0007 (0.0010)	0.0007 (0.0032)	-0.0009 (0.0051)	-0.0050 (0.0053)
Full Time	0.0011 (0.0010)	0.0020 (0.0026)	0.0009 (0.0053)	0.0026 (0.0074)	Manufacturing	-0.0003 (0.0009)	-0.0067 (0.0014)	-0.0060 (0.0021)	-0.0081 (0.0026)
Full Time Equiv.	-0.0053 (0.0016)	-0.0071 (0.0023)	-0.0067 (0.0052)	-0.0134 (0.0072)	No Targeting	0.0019 (0.0013)	0.0018 (0.0024)	-0.0032 (0.0043)	-0.0025 (0.0038)
Part Time	...	...	-0.0007 (0.0008)	0.0069 (0.0014)	Unemployed	0.0044 (0.0015)	0.0070 (0.0013)	0.0079 (0.0030)	0.0116 (0.0047)
Not Specified	0.0013 (0.0005)	-0.0008 (0.0009)	-0.0054 (0.0016)	-0.0084 (0.0017)	Disabled	-0.0107 (0.0011)	-0.0024 (0.0012)	0.0001 (0.0024)	0.0008 (0.0040)
Equal to tax owed	-0.0050 (0.0015)	-0.0057 (0.0058)	-0.0084 (0.0075)	-0.0234 (0.0150)	No Targeting	0.0008 (0.0016)	-0.0008 (0.0019)	-0.0061 (0.0053)	-0.0057 (0.0043)
Carry-forward	0.0018 (0.0010)	0.0011 (0.0065)	-0.0032 (0.0074)	-0.0035 (0.0091)	Temporary	-0.0019 (0.0020)	-0.0037 (0.0026)	-0.0038 (0.0036)	-0.0058 (0.0064)
Refundable	0.0008 (0.0026)	0.0009 (0.0033)	0.0051 (0.0034)	0.0034 (0.0049)	Permanent	0.0008 (0.0010)	0.0003 (0.0025)	-0.0013 (0.0044)	-0.0005 (0.0042)
Not Specified	0.0026 (0.0017)	0.0002 (0.0034)	-0.0014 (0.0044)	-0.0010 (0.0049)					

Notes from Table 5 apply. The only difference is that the lagged dependent variable is added as a control. Estimates are OLS.

Table 7: Estimated Effects of State Hiring Credits on Employment, Credit Count Specifications, First Differences, 2007-2011

Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags	Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags
Credit	0.0001 (0.0010)	0.0007 (0.0014)	0.0007 (0.0018)	0.0002 (0.0025)	Wage Requirement	0.0003 (0.0005)	0.0002 (0.0016)	0.0000 (0.0020)	-0.0002 (0.0023)
Jobs	0.0001 (0.0012)	0.0011 (0.0014)	0.0028 (0.0018)	0.0029 (0.0022)	No Wage Requirement	-0.0002 (0.0021)	0.0014 (0.0022)	0.0017 (0.0029)	0.0006 (0.0046)
Payroll	-0.0015 (0.0013)	-0.0031 (0.0018)	-0.0049 (0.0023)	-0.0074 (0.0041)	Recapture	-0.0005 (0.0024)	-0.0016 (0.0037)	-0.0011 (0.0052)	-0.0023 (0.0081)
Investment	0.0074 (0.0029)	0.0065 (0.0028)	0.0028 (0.0033)	0.0047 (0.0060)	No Recapture	0.0003 (0.0011)	0.0014 (0.0012)	0.0013 (0.0017)	0.0010 (0.0020)
Others	-0.0006 (0.0017)	0.0031 (0.0017)	0.0033 (0.0021)	0.0040 (0.0031)	Industry	-0.0012 (0.0018)	0.0009 (0.0030)	0.0010 (0.0040)	-0.0020 (0.0074)
Full Time	0.0015 (0.0007)	0.0027 (0.0012)	0.0028 (0.0015)	0.0037 (0.0017)	Manufacturing	0.0002 (0.0009)	-0.0059 (0.0013)	-0.0051 (0.0019)	-0.0065 (0.0023)
Full Time Equiv.	-0.0056 (0.0018)	-0.0068 (0.0020)	-0.0066 (0.0045)	-0.0132 (0.0063)	No Targeting	0.0005 (0.0011)	0.0009 (0.0013)	0.0009 (0.0018)	0.0010 (0.0021)
Part Time	...	...	0.0004 (0.0022)	0.0043 (0.0045)	Unemployed	0.0047 (0.0018)	0.0066 (0.0011)	0.0072 (0.0028)	0.0106 (0.0042)
Not Specified	0.0028 (0.0009)	-0.0005 (0.0009)	-0.0059 (0.0014)	-0.0076 (0.0017)	Disabled	-0.0110 (0.0012)	-0.0023 (0.0018)	-0.0003 (0.0028)	0.0005 (0.0038)
Equal to tax owed	-0.0040 (0.0018)	-0.0019 (0.0026)	-0.0021 (0.0037)	-0.0072 (0.0067)	No Targeting	0.0002 (0.0008)	0.0002 (0.0016)	0.0000 (0.0020)	-0.0010 (0.0028)
Carry-forward	0.0013 (0.0006)	0.0030 (0.0013)	0.0034 (0.0020)	0.0054 (0.0024)	Temporary	-0.0003 (0.0015)	-0.0008 (0.0020)	-0.0002 (0.0027)	-0.0016 (0.0042)
Refundable	0.0018 (0.0027)	0.0023 (0.0028)	0.0061 (0.0021)	0.0046 (0.0040)	Permanent	0.0004 (0.0009)	0.0022 (0.0013)	0.0017 (0.0017)	0.0023 (0.0021)
Not Specified	0.0011 (0.0011)	0.0001 (0.0021)	-0.0005 (0.0026)	-0.0004 (0.0029)					

Notes from Table 5 apply. The only difference is that counts of each type of credit, rather than dummy variables for the presence of each type of credit, are used as the hiring credit variables.

Table 8: Table 5 Specifications, with HIRE Act Included

Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags	Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags
Credit	0.0015 (0.0012)	0.0004 (0.0015)	-0.0005 (0.0021)	-0.0036 (0.0025)	Wage Requirement	-0.0016 (0.0016)	0.0013 (0.0033)	0.0014 (0.0050)	-0.0004 (0.0050)
Jobs	0.0017 (0.0009)	0.0006 (0.0013)	-0.0004 (0.0016)	-0.0021 (0.0025)	No Wage Requirement	0.0000 (0.0009)	-0.0019 (0.0017)	-0.0018 (0.0020)	-0.0041 (0.0041)
Payroll	-0.0006 (0.0006)	-0.0007 (0.0011)	-0.0003 (0.0013)	-0.0005 (0.0018)	Recapture	0.0036 (0.0025)	0.0067 (0.0028)	0.0095 (0.0017)	0.0119 (0.0032)
Investment	0.0111 (0.0008)	0.0086 (0.0016)	0.0063 (0.0012)	0.0084 (0.0034)	No Recapture	0.0006 (0.0007)	-0.0006 (0.0010)	-0.0005 (0.0013)	-0.0015 (0.0018)
Others	0.0005 (0.0009)	0.0027 (0.0013)	0.0041 (0.0016)	0.0051 (0.0021)	Industry	0.0006 (0.0007)	0.0005 (0.0028)	-0.0009 (0.0046)	-0.0044 (0.0048)
Full Time	0.0011 (0.0010)	0.0018 (0.0024)	0.0008 (0.0049)	0.0026 (0.0067)	Manufacturing	-0.0001 (0.0009)	-0.0067 (0.0012)	-0.0057 (0.0020)	-0.0068 (0.0023)
Full Time Equiv.	-0.0055 (0.0016)	-0.0067 (0.0020)	-0.0066 (0.0046)	-0.0129 (0.0065)	No Targeting	0.0003 (0.0010)	-0.0011 (0.0014)	-0.0019 (0.0016)	-0.0044 (0.0021)
Part Time	...	...	-0.0005 (0.0008)	0.0068 (0.0013)	Unemployed	0.0003 (0.0013)	-0.0010 (0.0020)	-0.0005 (0.0029)	-0.0028 (0.0039)
Not Specified	0.0014 (0.0009)	-0.0006 (0.0012)	-0.0008 (0.0016)	-0.0035 (0.0028)	Disabled	-0.0109 (0.0010)	-0.0022 (0.0012)	-0.0003 (0.0022)	0.0000 (0.0043)
Equal to tax owed	-0.0053 (0.0016)	-0.0053 (0.0054)	-0.0076 (0.0069)	-0.0226 (0.0141)	No Targeting	0.0009 (0.0017)	-0.0006 (0.0019)	-0.0054 (0.0049)	-0.0049 (0.0040)
Carry-forward	0.0020 (0.0009)	0.0013 (0.0058)	-0.0024 (0.0066)	-0.0024 (0.0080)	Temporary	0.0003 (0.0010)	-0.0018 (0.0014)	-0.0024 (0.0018)	-0.0048 (0.0035)
Refundable	0.0011 (0.0029)	0.0008 (0.0033)	0.0047 (0.0037)	0.0036 (0.0054)	Permanent	0.0005 (0.0010)	0.0000 (0.0020)	-0.0016 (0.0039)	-0.0009 (0.0035)
Not Specified	0.0009 (0.0009)	0.0002 (0.0013)	-0.0007 (0.0016)	-0.0015 (0.0025)					

Notes from Table 5 apply. The inclusion of the HIRE Act means that in the month in which it takes effect features of that credit are coded as “turning on” in any state that did not already have those features. The features that take effect in each state are listed in the last two columns of Table 4.

Table 9: Classifying Value of Hiring Credits Targeting the Unemployed

Not Including HIRE Act					Including HIRE Act				
Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags	Credit Variable(s)	Contemp.	+4 Lags	+8 Lags	+12 Lags
Unemployed	0.0022	0.0073	0.0113	0.0198	Unemployed	0.0000	-0.0021	-0.0004	-0.0042
≤ \$1000 Value	(0.0009)	(0.0016)	(0.0027)	(0.0032)	≤ \$1000 Value	(0.0018)	(0.0024)	(0.0038)	(0.0055)
Unemployed	0.0059	0.0066	0.0062	0.0080	Unemployed	0.0060	0.0066	0.0063	0.0080
> \$1000 Value	(0.0018)	(0.0016)	(0.0038)	(0.0053)	> \$1000 Value	(0.0019)	(0.0016)	(0.0038)	(0.0054)
Difference	-0.0037	0.0007	0.0051	0.0118	Difference	-0.0060	-0.0087	-0.0067	-0.0122
	(0.0021)	(0.0018)	(0.0044)	(0.0061)		(0.0028)	(0.0031)	(0.0056)	(0.0081)
Disabled	-0.0108	-0.0019	-0.0001	0.0003	Disabled	-0.0108	-0.0019	0.0000	0.0003
	(0.0011)	(0.0012)	(0.0022)	(0.0042)		(0.0010)	(0.0012)	(0.0022)	(0.0043)
No Targeting	0.0008	-0.0007	-0.0054	-0.0049	No Targeting	0.0009	-0.0007	-0.0055	-0.0049
	(0.0016)	(0.0020)	(0.0051)	(0.0041)		(0.0016)	(0.0019)	(0.0050)	(0.0039)

Notes from Tables 5 and 7 apply. The specification corresponds to the second-to-last one in those tables.

Table 10: Estimated Effects of State Hiring Credits on Employment, Credit Dummy Variables Specifications, Extended Sample Period, Key Results

Credit Variable(s)	Table 5 Estimates, 2007-2011		1995-2011			1990-2011, No UI Controls		
	Contemp.	+12 Lags	Contemp.	+12 Lags	Addl. credits	Contemp.	+12 Lags	Addl. credits
Credit	0.0009 (0.0016)	-0.0047 (0.0039)	-0.0019 (0.0017)	0.0016 (0.0034)	17	-0.0003 (0.0011)	0.0015 (0.0022)	26
Investment	0.0108 (0.0008)	0.0087 (0.0034)	0.0022 (0.0015)	0.0053 (0.0038)	12	0.0015 (0.0013)	0.0039 (0.0032)	15
Full Time Equiv.	-0.0053 (0.0017)	-0.0126 (0.0065)	-0.0036 (0.0011)	-0.0046 (0.0040)	6	-0.0021 (0.0011)	-0.0055 (0.0037)	10
Part Time	...	0.0069 (0.0013)	-0.0010 (0.0012)	-0.0008 (0.0036)	1	-0.0016 (0.0016)	-0.0024 (0.0020)	1
Refundable	0.0013 (0.0026)	0.0032 (0.0043)	0.0014 (0.0017)	0.0038 (0.0025)	6	0.0013 (0.0013)	0.0038 (0.0021)	8
Recapture	0.0036 (0.0025)	0.0121 (0.0031)	0.0005 (0.0018)	0.0066 (0.0030)	17	0.0011 (0.0012)	0.0042 (0.0023)	25
Unemployed	0.0047 (0.0018)	0.0108 (0.0042)	0.0027 (0.0023)	-0.0003 (0.0063)	1	0.0017 (0.0023)	-0.0005 (0.0052)	2

The dependent variable is the first difference of the log of employment. The fifth and eighth columns show the number of additional states where credits were introduced over the longer sample period relative to the 2007-2011 period. The specification includes the first difference of the job credit dummy or dummies, and of 12 lags. In this table, only the contemporaneous effect and the cumulative effects through 12 lags are reported. The table reports selected estimates from some of the same specifications shown in the previous tables. The other controls are the same with two exceptions. First, for both the 1995-2011 and 1990-2011 estimates, the cyclical control is constructed using 1990 as the baseline year, rather than 2006. Second, the data on UI benefit extensions are not available for the earliest years and hence the UI benefit controls are not included in the 1990-2011 estimates. However, re-estimating the models in Table 5 excluding these data had almost no effect on the estimates. The data are monthly. Standard errors, reported in parentheses, are clustered at the state level.

Table 11: Estimated Effects of State Hiring Credits on Employment, Credit Dummy Variables Specifications, First Differences, 2007-2011, Quarterly Workforce Indicators Data

Credit Variable(s)	Contemp.	+2 Lags	+4 Lags	Credit Variable(s)	Contemp.	+2 Lags	+4 Lags
Credit	0.0029 (0.0029)	-0.0023 (0.0045)	-0.0049 (0.0052)	Wage Requirement	-0.0007 (0.0034)	0.0010 (0.0060)	-0.0037 (0.0077)
Jobs	0.0068 (0.0042)	0.0025 (0.0067)	0.0021 (0.0082)	No Wage Requirement	0.0001 (0.0039)	0.0003 (0.0069)	-0.0043 (0.0083)
Payroll	-0.0078 (0.0061)	-0.0096 (0.0073)	-0.0129 (0.0090)	Recapture	0.0064 (0.0037)	0.0159 (0.0034)	0.0186 (0.0080)
Investment	-0.0120 (0.0046)	-0.0152 (0.0074)	-0.0153 (0.0090)	No Recapture	0.0059 (0.0024)	0.0000 (0.0047)	-0.0017 (0.0066)
Others	0.0086 (0.0020)	0.0038 (0.0026)	0.0078 (0.0045)	Industry	-0.0005 (0.0058)	0.0034 (0.0075)	0.0000 (0.0084)
Full Time	0.0028 (0.0027)	0.0046 (0.0076)	0.0055 (0.0119)	Manufacturing	-0.0018 (0.0014)	-0.0132 (0.0030)	-0.0159 (0.0035)
Full Time Equiv.	-0.0073 (0.0020)	-0.0072 (0.0067)	-0.0092 (0.0072)	No Targeting	0.0057 (0.0022)	0.0046 (0.0050)	0.0048 (0.0069)
Part Time		0.0014 (0.0016)	-0.0069 (0.0045)	Unemployed	0.0058 (0.0011)	0.0092 (0.0059)	0.0157 (0.0079)
Not Specified	0.0045 (0.0021)	-0.0081 (0.0032)	-0.0171 (0.0036)	Disabled	-0.0133 (0.0017)	-0.0019 (0.0034)	-0.0086 (0.0050)
Equal to tax owed	-0.0037 (0.0018)	-0.0041 (0.0047)	-0.0059 (0.0088)	No Targeting	0.0027 (0.0029)	-0.0029 (0.0045)	-0.0058 (0.0051)
Carry-forward	-0.0014 (0.0107)	-0.0148 (0.0214)	-0.0173 (0.0202)	Temporary	-0.0009 (0.0025)	0.0000 (0.0040)	0.0000 (0.0057)
Refundable	-0.0013 (0.0031)	-0.0011 (0.0052)	-0.0018 (0.0084)	Permanent	0.0053 (0.0028)	0.0057 (0.0057)	0.0042 (0.0067)
Not Specified	0.0029 (0.0029)	-0.0033 (0.0043)	-0.0046 (0.0066)				

The dependent variables are the first differences of the log of employment. The QWI data are quarterly, rather than monthly, so all data had to be collapsed to the quarterly level. The hiring credit dummy variables are defined as 1 if the credit is in place for all 3 months of a quarter, 2/3 if it is in place for 2 months, and 1/3 if it is in place for one month, and 0 otherwise. The notes from Table 5 apply, although with 12 monthly lags replaced with 4 quarterly lags wherever appropriate. Only the contemporaneous effect and the cumulative effects through 2 and 4 quarterly lags are reported.

Table 12: Estimated Effects of State Hiring Credits on Hiring, Credit Dummy Variables Specifications, First Differences, 2007-2011, Quarterly Workforce Indicators Data

Credit Variable(s)	Contemp.	+2 Lags	+4 Lags	Credit Variable(s)	Contemp.	+2 Lags	+4 Lags
Credit	-0.0243 (0.0266)	-0.0469 (0.0667)	-0.0273 (0.0759)	Wage Requirement	0.0153 (0.0181)	0.0047 (0.0317)	0.0022 (0.0303)
Jobs	-0.0348 (0.0273)	-0.0482 (0.0632)	-0.0306 (0.0688)	No Wage Requirement	-0.0177 (0.0199)	-0.0031 (0.0337)	-0.0111 (0.0588)
Payroll	0.0391 (0.0408)	0.0327 (0.0440)	0.0523 (0.0786)	Recapture	0.1433 (0.0654)	0.1439 (0.0927)	0.1486 (0.0700)
Investment	0.0041 (0.0333)	-0.0190 (0.0679)	-0.1392 (0.0774)	No Recapture	-0.0107 (0.0280)	-0.0259 (0.0502)	-0.0325 (0.0776)
Others	-0.0033 (0.0230)	0.0335 (0.0246)	0.0671 (0.0736)	Industry	-0.0250 (0.0195)	-0.0380 (0.0405)	-0.0430 (0.0959)
Full Time	0.0819 (0.0674)	0.1129 (0.0878)	0.1541 (0.0831)	Manufacturing	0.0037 (0.0200)	0.0997 (0.0334)	0.1161 (0.0375)
Full Time Equiv.	-0.0155 (0.0206)	-0.0168 (0.0360)	0.0083 (0.0625)	No Targeting	0.0227 (0.0312)	0.0380 (0.0628)	0.0895 (0.0835)
Part Time	...	0.0533 (0.0118)	-0.0011 (0.0657)	Unemployed	0.0971 (0.0424)	0.1160 (0.0577)	0.1776 (0.0485)
Not Specified	-0.1453 (0.0230)	-0.1003 (0.0251)	-0.1782 (0.0320)	Disabled	0.0523 (0.0206)	0.0421 (0.0320)	0.0014 (0.0657)
Equal to tax owed	-0.0020 (0.0173)	0.0484 (0.0136)	0.0873 (0.0630)	No Targeting	-0.0264 (0.0262)	-0.0527 (0.0633)	-0.0311 (0.0718)
Carry-forward	-0.0869 (0.0560)	-0.0677 (0.0620)	-0.0758 (0.0694)	Temporary	0.0191 (0.0256)	0.0217 (0.0328)	0.0280 (0.0446)
Refundable	0.0266 (0.0117)	-0.0020 (0.0250)	0.0259 (0.0585)	Permanent	-0.0092 (0.0179)	0.0032 (0.0530)	0.0296 (0.0606)
Not Specified	0.0031 (0.0190)	0.0111 (0.0455)	0.0160 (0.0476)				

The dependent variable is the first differences of the log of hiring. Notes from Table 12 apply.

Appendix Table A1: Details of Job Creation Hiring Credits, 1969-2012

State	Program	Initial date	Final date	Duration of program	Temporary/permanent	Type of benefit provided	Eligibility requirements	Basis for providing benefits	Value per job created	Limitations to the program's benefits	Type of job required	Targeted by industry	Targeted by business	Targeted by worker	Recapture provisions	Wage requirement	Geographic provisions
AL	Income tax capital credit	1995 (Jun)	Current	17	Temporary	Tax credit	Jobs and investment	Jobs and investment	High	Equal to tax owed	Full-time	Targeted	-	-	Yes	Yes	Yes
AL	Reemployment act	2010 (Jan)	Current	2	Temporary	Tax credit	Jobs	Payroll	High	Equal to tax owed	Full-time	-	-	Unemployed	No	Yes	No
AL	Full employment act of 2011	2011 (Jun)	Current	1	Permanent	Tax credit	Jobs	Jobs	Low	Equal to tax owed	Full-time	-	Small business	-	No	Yes	No
AZ	Credit for employment of temporary assistance for needy families recipients (TANF)	1998 (Jan)	Current	14	Permanent	Tax credit	Jobs	Jobs and payroll	Low	Carry-forward	Full-time	-	-	Welfare recipients	No	Yes	No
AZ	Credit for new employment	2011 (Jun)	Current	1	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	-	-	-	No	No	No
AZ	Quality jobs tax credit (Premium credit for new employment)	2011 (Jun)	Expires 2017 (Jun)	1	Temporary	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	-	-	-	No	Yes	Yes
AR	Arkansas economic development act	1995 (Jan)	Replaced 2003 (Mar)	8	Permanent	Tax credit	Jobs, payroll and investment	Jobs and payroll	Not determinable	Carry-forward	Full-time	-	-	-	Yes	Yes	Yes
AR	Job-creation tax credit (Advantage Arkansas)	2003 (Mar)	Current	9	Permanent	Tax credit	Payroll	Payroll	Low	Carry-forward	Full-time	-	-	-	Yes	Yes	Yes
AR	Investment income tax credit (ArkPlus)	2003 (Mar)	Current	9	Permanent	Tax credit	Payroll and investment	Jobs, payroll and investment	High	Carry-forward	Full-time	-	-	-	No	No	Yes
AR	Payroll rebate (Create rebate)	2003 (Mar)	Current	9	Permanent	Tax credit	Jobs and payroll	Jobs and payroll	High	Equal to tax owed	Full-time	-	-	-	No	Yes	Yes
CA	Jobs tax credit (Credit for percentage of wages paid to certain employees)	1986 (Sept)	Expired 1993 (Dec)	7	Temporary	Tax credit	Jobs	Jobs and payroll	Low	Not specified	Not specified	-	-	Welfare recipients	No	No	No
CA	Credit against net tax; Increase in qualified full-time employees (New jobs credit)	2009 (Jan)	Current	3	Undetermined	Tax credit	Jobs	Jobs	High	Not specified	Full-time	-	Small business	-	No	No	No
CO	Strategic fund program	1987 (Jan)	Current	25	Permanent	Grant or payment	Jobs and other requirements	Jobs	High	Not specified	Full-time	-	-	-	No	Yes	Yes
CO	Performance-based incentive for new job creation--new jobs incentives cash fund (Job creation performance incentive fund)	2006 (Jan)	Expired 2010 (Dec)	4	Temporary	Grant or payment	Jobs	Jobs and payroll	High	Not specified	Full-time	-	-	-	No	Yes	Yes
CO	Job growth incentive tax credit	2009 (Jan)	Expires 2014 (Dec)	3	Temporary	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time equivalent	-	-	-	No	Yes	Yes
CT	Tax credit for taxpayers occupying new facilities and creating new jobs	1993 (Jul)	Repealed 1997 (Dec)	4	Temporary	Tax credit	Jobs and other requirements	Jobs and others	Not determinable	Equal to tax owed	Full-time equivalent	-	-	-	Yes	No	No
CT	Hiring incentive credit	1997 (Jul)	Current	14	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	-	-	Welfare recipients	No	No	No

State	Program	Initial date	Final date	Duration of program	Temporary/permanent	Type of benefit provided	Eligibility requirements	Basis for providing benefits	Value per job created	Limitations to the program's benefits	Type of job required	Targeted by industry	Targeted by business	Targeted by worker	Recapture provisions	Wage requirement	Geographic provisions
CT	Employment expansion project credit	2005 (Sept)	Current	6	Permanent	Tax credit	Jobs and other requirements	Jobs	Not determinable	Not specified	Full-time	-	Large business	-	Yes	No	No
CT	Job creation credit	2006 (Jan)	Expired 2011 (Dec)	5	Permanent	Tax credit	Jobs	Jobs	High	Equal to tax owed	Full-time	-	-	-	Yes	No	No
CT	Small business job creation tax credit	2010 (Jan)	Expires 2012 (Dec)	2	Temporary	Tax credit	Jobs	Jobs	High	Equal to tax owed	Full-time	-	Small business	-	No	No	No
CT	Vocational rehabilitation job creation tax credit	2010 (Jan)	Expired 2011 (Dec)	1	Permanent	Tax credit	Jobs	Jobs	High	Equal to tax owed	Full-time equivalent	-	-	Disabled	No	No	No
CT	Job expansion tax credit (JET)	2012 (Jan)	Expires 2013 (Dec)	0	Temporary	Tax credit	Jobs	Jobs	High	Equal to tax owed	Full-time	-	-	Disabled, unemployed	No	No	No
DE	New job creation credit, formerly Blue collar job act (Investment & employment credit against corporation income tax)	1979 (Jun)	Current	33	Temporary	Tax credit	Jobs and investment	Jobs	Low	Carry-forward	Full-time	-	-	-	No	No	Yes
DE	Delaware strategic fund	1994 (Jun)	Current	18	Permanent	Grant or payment	Jobs and investment	Jobs and others	Discretionary	Not specified	Not specified	-	-	-	No	No	Yes
DE	New economy jobs program credit	2007 (Jun)	Expires 2013 (Dec)	5	Temporary	Tax credit	Jobs	Jobs and payroll	High	Refundable	Full-time equivalent	-	-	-	Yes	Yes	Yes
FL	High impact business tax credit	1997 (Jul)	Current	14	Permanent	Grant or payment	Jobs and investment	Jobs and investment	High	Not specified	Full-time equivalent	Targeted	-	-	No	No	No
FL	Capital investment tax credit	1998 (Jul)	Current	13	Permanent	Tax credit	Jobs and investment	Investment	High	Equal to tax owed	Full-time equivalent	Targeted	-	-	No	Yes	No
FL	Jobs for the unemployed tax credit program	2010 (Jul)	Expired 2012 (Jun)	1	Temporary	Tax credit	Jobs	Jobs	Low	Carry-forward	Full-time	Targeted	-	Unemployed	Yes	Yes	No
GA	Job tax credit	1994 (Sept)	Current	17	Not determinable	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	Targeted	-	-	Yes	Yes	Yes
GA	Headquarter jobs tax credit	2001 (Jan)	Current	11	Not determinable	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	-	Headquarters	-	Yes	Yes	Yes
GA	Mega project tax credit	2003 (Jan)	Current	9	Permanent	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	-	Large business	-	Yes	Yes	Yes
GA	Job tax credit bonus for existing businesses	2006 (Jan)	Expired 2010 (Dec)	4	Temporary	Tax credit	Jobs	Jobs	Low	Not specified	Full-time	Targeted	-	-	No	Yes	Yes
GA	Quality jobs tax credit	2009 (Jan)	Current	3	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	-	-	-	Yes	Yes	No
HI	Credit for employment of vocational rehabilitation referrals	1990 (Jan)	Current	22	Permanent	Tax credit	Jobs	Jobs and payroll	High	Carry-forward	Not specified	-	-	Disabled	No	No	No
ID	New jobs income tax credit (\$500) (Special credit available -- new employees)	2002 (Jan)	Replaced 2011 (April)	9	Permanent	Tax credit	Jobs	Jobs	Low	Carry-forward	Part-time	Targeted	-	-	No	No	No

State	Program	Initial date	Final date	Duration of program	Temporary/permanent	Type of benefit provided	Eligibility requirements	Basis for providing benefits	Value per job created	Limitations to the program's benefits	Type of job required	Targeted by industry	Targeted by business	Targeted by worker	Recapture provisions	Wage requirement	Geographic provisions
ID	New jobs income tax credit (\$1000) (Special credit available -- new employees)	2004 (Jan)	Replaced 2011 (April)	7	Permanent	Tax credit	Jobs	Jobs	Low	Carry-forward	Part-time	Targeted	-	-	No	Yes	No
ID	Small employer new jobs tax credit	2005 (Jan)	Expires 2020 (Dec)	7	Temporary	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	-	Small business	-	Yes	Yes	No
ID	Hire one tax credit (Special credit available -- new employees)	2011 (April)	Expires 2013 (Dec)	1	Temporary	Tax credit	Jobs	Jobs and payroll	High	Refundable	Part-time	-	-	-	No	Yes	No
IL	Large business development program (LBDP)	1991 (Jul)	Current	20	Permanent	Grant or payment	Jobs and investment	Jobs and investment	Discretionary	Not specified	Full-time equivalent	Targeted	Large business	-	Yes	No	No
IL	Economic development for a growing economy tax credit program (EDGE)	1999 (Jan)	Expires 2016 (Dec)	13	Permanent	Tax credit	Jobs and investment	Jobs and payroll	Discretionary	Carry-forward	Full-time	-	-	-	No	No	No
IL	Small business job creation tax credit	2010 (Jul)	Expires 2016 (Jun)	1	Temporary	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	-	Small business	-	No	Yes	No
IN	Economic development for a growing economy (EDGE) tax credit	1994 (Jan)	Current	18	Permanent	Tax credit	Jobs and other requirements	Jobs and payroll	Discretionary	Refundable	Full-time	-	-	-	Yes	Yes	Yes
IN	Headquarters relocation tax credit	2006 (Jan)	Current	6	Permanent	Tax credit	Jobs and investment	Others	Not determinable	Carry-forward	Not specified	-	Headquarters	-	No	No	No
IN	New employers tax credit	2010 (Jan)	Expires 2012 (Dec)	2	Temporary	Tax credit	Jobs	Payroll	High	Carry-forward	Full-time	-	-	-	No	No	No
IA	New jobs tax credit	1985 (Jan)	Current	27	Permanent	Tax credit	Jobs and other requirements	Jobs and payroll	High	Carry-forward	Full-time	-	-	-	No	No	No
IA	New jobs and income act	1994 (May)	Replaced 2005 (Jun)	11	Permanent	Tax credit	Jobs and investment	Jobs	High	Not specified	Full-time	-	-	-	Yes	Yes	No
IA	High quality jobs program (formerly High quality job creation program)	2005 (Jun)	Current	7	Permanent	Tax credit	Jobs and investment	Jobs	High	Carry-forward and refundable	Full-time equivalent	-	-	-	Yes	Yes	No
IA	Wage-benefit tax credit	2005 (Jun)	Repealed 2008 (Jul)	3	Temporary	Tax credit	Jobs	Jobs and payroll	High	Refundable	Full-time	-	-	-	No	Yes	Yes
KS	Business and job development credit (Credit against tax for establishment of qualified business facility)	1976 (Jan)	Current	36	Not determinable	Tax credit	Jobs and investment	Jobs	Low	Equal to tax owed	Part-time	-	-	-	No	No	No
KS	Enterprise zone job creation tax credit (Kansas enterprise zone act)	1993 (Jan)	Current	19	Permanent	Tax credit	Jobs and investment	Jobs	Discretionary	Carry-forward	Part-time	-	-	-	No	No	Yes

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KS	Promoting employment across Kansas program (Peak)	2009 (Jul)	Current	2	Permanent	Tax credit	Jobs	Payroll	High	Not specified	Part-time	-	-	-	No	Yes	Yes
KY	Unemployment income tax credit (Credit allowed for hiring person classified as unemployed)	1982 (Jul)	Current	29	Permanent	Tax credit	Jobs	Jobs	Low	Equal to tax owed	Part-time	-	-	Unemployed	No	No	No
KY	Kentucky industrial revitalization act (KIRA)	1992 (Jul)	Current	19	Permanent	Tax credit	Jobs and other requirements	Investment and others	Discretionary	Not specified	Full-time	Targeted	-	-	No	No	No
KY	Kentucky business investment program (replaces KREDA, KEOZ, KJDA, and KIDA programs)	2009 (Jun)	Current	3	Permanent	Tax credit	Jobs and other requirements	Others	High	Carry-forward	Full-time	Targeted	-	-	Yes	Yes	Yes
KY	Small business investment credit (KSBIC)	2009 (Jun)	Current	3	Permanent	Tax credit	Jobs and investment	Jobs and investment	Discretionary	Carry-forward	Full-time	-	Small business	-	No	Yes	No
LA	Credit for new jobs	1980 (Jan)	Current	32	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Part-time	-	-	-	No	No	Yes
LA	Credit for employment of the previously unemployed	1992 (Jan)	Current	20	Permanent	Tax credit	Jobs	Jobs	Low	Carry-forward	Full-time	-	-	Unemployed, welfare recipients	No	No	No
LA	Quality jobs program act	1995 (Jul)	Expires 2017 (Dec)	16	Temporary	Tax credit	Jobs	Jobs and payroll	High	Refundable	Full-time	Targeted	-	-	Yes	Yes	Yes
LA	Capital investment tax credit	1996 (Jul)	Expired 2000 (Jun)	3	Temporary	Tax credit	Jobs and investment	Investment	Discretionary	Refundable	Full-time	-	-	-	No	Yes	No
ME	Jobs & investment tax credit	1979 (Jan)	Current	33	Permanent	Tax credit	Jobs and investment	Payroll	High	Carry-forward	Not specified	-	-	-	Yes	No	No
MD	Job creation tax credit	1996 (Jan)	Expires 2019 (Dec)	16	Temporary	Tax credit	Jobs	Jobs and payroll	Low	Carry-forward	Full-time	-	-	-	Yes	Yes	Yes
MD	Businesses that create new jobs tax credit	1997 (Oct)	Current	14	Temporary	Tax credit	Jobs and other requirements	Others	Not determinable	Carry-forward	Full-time	-	-	-	Yes	Yes	Yes
MD	Disability employment tax credit	1997 (Oct)	Expired 2012 (Jun)	14	Temporary	Tax credit	Jobs	Payroll	High	Carry-forward	Not specified	-	-	Disabled	No	No	No
MI	Entrepreneurial credit	2008 (Jan)	Expired 2010 (Dec)	2	Temporary	Tax credit	Jobs and investment	Payroll	Not determinable	Equal to tax owed	Full-time equivalent	Targeted	-	-	Yes	No	No
MA	Full employment program credit	1995 (Nov)	Current	16	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	-	-	Welfare recipients	No	No	No
MA	Economic development incentive program - Enhanced expansion project	2010 (Jan)	Current	2	Permanent	Tax credit	Jobs	Investment	Not determinable	Not specified	Full-time	-	-	-	Yes	No	No
MI	Michigan economic growth authority (MEGA)	1995 (April)	Current	17	Permanent	Tax credit	Jobs and other requirements	Jobs, payroll, investment and others	High	Refundable	Full-time	Targeted	-	-	Yes	Yes	Yes

State	Program	Initial date	Final date	Duration of program	Temporary/permanent	Type of benefit provided	Eligibility requirements	Basis for providing benefits	Value per job created	Limitations to the program's benefits	Type of job required	Targeted by industry	Targeted by business	Targeted by worker	Recapture provisions	Wage requirement	Geographic provisions
MN	Investment fund	1996 (Jul)	Current	15	Permanent	Grant or payment	Jobs and investment	Jobs, investment and others	Discretionary	Not specified	Full-time equivalent	-	-	-	Yes	Yes	No
MS	Qualified business tax credit	1983 (Jan)	Current	29	Temporary	Tax credit	Jobs and investment	Jobs	Low	Equal to tax owed	Full-time	-	-	-	No	No	Yes
MS	Jobs tax credit	1989 (Jan)	Current	23	Permanent	Tax credit	Jobs	Jobs and payroll	High	Carry-forward	Full-time	Targeted	-	-	No	No	Yes
MS	Advantage jobs incentive program	2000 (Aug)	Current	11	Permanent	Grant or payment	Jobs	Jobs and payroll	High	Not specified	Full-time	-	-	-	No	Yes	Yes
MS	Jobs tax credit for large business (Permanent business enterprise job tax credit)	2000 (Nov)	Current	11	Permanent	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	-	Large business	-	No	No	No
MS	Job creation tax credit (450 or more full-time jobs)	2005 (Jan)	Current	7	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	-	-	-	No	No	No
MS	Qualified business or industry job tax credit	2007 (May)	Current	5	Permanent	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	Targeted	-	-	No	No	No
MO	Business facility tax credit program (Credit for new or expanded business facility)	1980 (Jan)	Current	32	Permanent	Tax credit	Jobs and investment	Jobs	Low	Refundable	Part-time	-	-	-	No	No	Yes
MO	Business use incentives for large scale development	1997 (Jan)	Current	15	Permanent	Tax credit	Jobs and investment	Payroll, investment and others	Discretionary	Refundable	Full-time	Targeted	Large business	-	Yes	Yes	Yes
MO	Quality jobs program	2005 (Jul)	Current	6	Permanent	Tax credit	Jobs	Payroll	High	Refundable	Full-time	-	-	-	No	Yes	No
MO	Manufacturing jobs act	2010 (Oct)	Expires 2016 (Oct)	1	Temporary	Tax credit	Jobs and investment	Payroll	Low	Not specified	Full-time	Manufacturing	-	-	Yes	Yes	No
MT	New or expanded industry credit	1975 (Jan)	Current	37	Permanent	Tax credit	Jobs	Jobs and payroll	Low	Not specified	Full-time	Manufacturing	-	-	No	No	No
NE	Employment and investment growth act	1987 (Jan)	Expired 2005 (Dec)	18	Permanent	Tax credit	Jobs and investment	Payroll, investment and others	High	Carry-forward	Full-time equivalent	-	-	-	Yes	No	No
NE	Quality jobs act	1995 (Feb)	Repealed 2000 (Jan)	4	Temporary	Tax credit	Jobs and investment	Payroll	High	Carry-forward	Full-time equivalent	-	-	-	Yes	Yes	No
NE	Nebraska advantage act	2006 (Jan)	Expires 2015 (May)	6	Temporary	Tax credit	Jobs and investment	Jobs, payroll, investment and others	High	Carry-forward	Full-time equivalent	-	-	-	Yes	Yes	Yes
NE	Invest Nebraska act	2001 (May)	Expired 2005 (May)	4	Temporary	Tax credit	Jobs and investment	Payroll	High	Carry-forward	Full-time equivalent	-	-	-	Yes	Yes	No
NV	Sales and use tax abatement (Abatement for eligible machinery or equipment used by certain new or expanded businesses)	1995 (Jul)	Current	16	Permanent	Tax credit	Jobs and investment	Jobs, investment and others	Not determinable	Equal to tax owed	Full-time	-	-	-	Yes	Yes	Yes

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NV	Modified business tax abatement (Partial abatement of tax during initial period of operation of employer)	2005 (Jul)	Current	6	Permanent	Tax credit	Jobs and investment	Jobs, payroll, investment and others	Not determinable	Equal to tax owed	Full-time	-	-	-	Yes	Yes	Yes
NJ	New jobs investment tax credit	1993 (Jul)	Current	18	Permanent	Tax credit	Jobs and investment	Jobs and others	Not determinable	Equal to tax owed	Full-time equivalent	-	-	-	Yes	Yes	No
NJ	Manufacturing equipment and employment investment tax credit	1995 (Aug)	Expires 2016 (Nov)	16	Temporary	Tax credit	Jobs and investment	Jobs and others	High	Carry-forward	Full-time equivalent	-	-	-	No	No	No
NJ	Business employment incentive program (BEIP)	1996 (May)	Current	16	Permanent	Grant or payment	Jobs	Jobs, investment and others	High	Equal to tax owed	Full-time	-	-	-	Yes	Yes	No
NJ	Business retention and relocation assistance act grant (BRRAG)	1996 (May)	Current	16	Permanent	Tax credit	Jobs and other requirements	Jobs	High	Equal to tax owed	Full-time	-	-	-	No	No	No
NJ	Income tax credit for employment of certain handicapped persons	2006 (Jan)	Current	6	Permanent	Tax credit	Jobs	Payroll	Low	Carry-forward	Part-time	-	-	Disabled	No	No	No
NJ	InvestNJ business grant program - employment grant component for eligible businesses	2008 (Dec)	Expired 2010 (Dec)	2	Temporary	Grant or payment	Jobs	Jobs	High	Not specified	Full-time	-	-	-	No	No	No
NM	Investment credit act - employment requirements	1983 (Jan)	Current	29	Permanent	Tax credit	Jobs and investment	Others	Not determinable	Carry-forward	Full-time equivalent	Manufacturing	-	-	No	No	No
NM	Welfare to work tax credit	1998 (Jan)	Current	14	Permanent	Tax credit	Jobs and other requirements	Jobs and others	High	Carry-forward	Not specified	-	-	Welfare recipients	No	Yes	No
NM	High-wage jobs tax credits	2004 (Jul)	Expires 2015 (Jun)	7	Temporary	Tax credit	Jobs and other requirements	Payroll	High	Refundable	Not specified	-	-	-	No	Yes	Yes
NY	Investment tax credit - Additional investment tax credit	1976 (Jan)	Expired 1986 (Dec)	10	Temporary	Tax credit	Jobs and investment	Investment	Not determinable	Carry-forward	Not specified	Targeted	-	-	No	No	No
NY	Investment tax credit - Employment incentive credit	1987 (Jan)	Current	25	Permanent	Tax credit	Jobs and investment	Jobs and investment	Not determinable	Carry-forward	Not specified	Targeted	-	-	No	No	No
NY	Jobs now	1996 (Jul)	Current	15	Permanent	Grant or payment	Jobs	Jobs and payroll	Discretionary	Not specified	Full-time	Targeted	-	-	No	No	No
NY	Credit for employment of persons with disabilities	1997 (Jan)	Current	15	Permanent	Tax credit	Jobs	Payroll	High	Carry-forward	Full-time	-	-	Disabled	No	No	No
NY	Excelsior jobs tax credit	2010 (Jul)	Current	1	Permanent	Tax credit	Jobs	Jobs and payroll	High	Refundable	Full-time equivalent	Targeted	-	-	No	No	No
NC	William S. Lee quality jobs and business expansion act (Credit for creating jobs)	1996 (Aug)	Repealed 2006 (Dec)	10	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time equivalent	Targeted	-	-	Yes	Yes	Yes
NC	Job development investment grant	2003 (Jan)	Expires 2015 (Dec)	9	Temporary	Grant or payment	Jobs and other requirements	Jobs and payroll	Discretionary	Not specified	Full-time	-	-	-	Yes	Yes	Yes

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NC	One North Carolina fund	2004 (Jun)	Current	8	Permanent	Grant or payment	Jobs and other requirements	Jobs, payroll and others	Discretionary	Not specified	Full-time	-	-	-	Yes	Yes	No
NC	Credit for creating jobs	2007 (Jan)	Expires 2013 (Jan)	5	Temporary	Tax credit	Jobs	Jobs	High	Carry-forward	Full-time	-	-	-	Yes	Yes	Yes
ND	Corporate tax credit for new industry (wage and salary credit)	1969 (Jan)	Current	43	Permanent	Tax credit	Jobs	Payroll	Low	Not specified	Not specified	Targeted	-	-	No	No	No
ND	Employment of the developmentally disabled or chronically mentally ill credit	1987 (Jan)	Current	25	Permanent	Tax credit	Jobs	Jobs and payroll	Low	Not specified	Not specified	-	-	Disabled	No	No	No
ND	Income tax exemption for new or expanding businesses	1990 (Mar)	Current	22	Permanent	Tax credit	Jobs	Payroll and others	Discretionary	Not specified	Not specified	-	-	-	No	No	No
OH	Job creation tax credit program	1993 (Jan)	Current	19	Permanent	Tax credit	Jobs	Jobs and payroll	Not determinable	Refundable	Full-time	-	-	-	Yes	Yes	No
OH	Job retention tax credit program	2002 (Jan)	Current	10	Temporary	Tax credit	Jobs, payroll and investment	Jobs and payroll	High	Carry-forward	Full-time equivalent	-	-	-	Yes	Yes	No
OK	The investment / new jobs income tax credit	1981 (Jan)	Current	31	Temporary	Tax credit	Jobs and investment	Jobs and investment	Low	Carry-forward	Full-time equivalent	-	-	-	No	Yes	No
OK	Manufacturing facilities-exemption from Ad valorem tax	1992 (Jan)	Current	20	Permanent	Tax credit	Payroll	Payroll	Not determinable	Not specified	Full-time equivalent	Manufacturing	-	-	Yes	Yes	Yes
OK	Quality jobs program	1993 (Jul)	Current	18	Undetermined	Grant or payment	Payroll	Jobs, payroll and others	High	Not specified	Full-time equivalent	-	-	-	Yes	Yes	No
OK	The 21st century Oklahoma quality jobs program	2009 (Nov)	Current	2	Undetermined	Grant or payment	Jobs	Payroll and others	High	Not specified	Full-time	Targeted	-	-	No	Yes	No
OR	Strategic investment program	1995 (Jul)	Current	16	Permanent	Tax credit	Jobs and investment	Others	Not determinable	Not specified	Not specified	Targeted	-	-	No	No	Yes
PA	Employment incentive payments credit	1982 (Jul)	Expired 2009 (Dec)	27	Temporary	Tax credit	Jobs	Payroll	High	Carry-forward	Not specified	-	-	-	No	No	No
PA	Job creation tax credit	1986 (Jul)	Current	25	Permanent	Tax credit	Jobs and other requirements	Jobs	Low	Not specified	Full-time	-	-	-	Yes	Yes	No
RI	Jobs development act	1994 (Jun)	Current	18	Permanent	Tax credit	Jobs	Jobs and others	Not determinable	Not specified	Full-time equivalent	-	-	-	No	Yes	No
RI	Hiring of unemployed or low income residents (The tax incentives for employers act)	1997 (Jan)	Current	15	Permanent	Tax credit	Jobs	Jobs and payroll	High	Equal to tax owed	Not specified	-	-	Unemployed	No	No	No
SC	Job development credit (Enterprise zone act)	1995 (April)	Current	17	Permanent	Tax credit	Jobs and investment	Jobs and payroll	High	Refundable	Full-time	Targeted	-	-	No	Yes	Yes
SC	Credit for employers hiring recipients of family independence payments (Employer tax credit)	1995 (Jan)	Current	17	Permanent	Tax credit	Jobs	Jobs and payroll	High	Carry-forward	Full-time	-	-	Welfare recipients	No	No	Yes

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SC	Corporate headquarters tax credit	1996 (Jan)	Current	16	Permanent	Tax credit	Jobs and investment	Others	Not determinable	Carry-forward	Full-time	-	Headquarters	-	Yes	Yes	No
SC	Job tax credit	1996 (Jan)	Current	16	Permanent	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	-	-	-	No	Yes	Yes
TN	Sales and use tax credit for qualified headquarters facilities	1997 (Jan)	Current	15	Temporary	Tax credit	Jobs and investment	Others	Not determinable	Not specified	Full-time	-	Headquarters	-	Yes	Yes	No
TN	Jobs tax credit	1999 (Jul)	Expires 2013 (Dec)	12	Temporary	Tax credit	Jobs and investment	Jobs	High	Carry-forward	Full-time	-	-	-	No	Yes	Yes
TN	Headquarters relocation credit	2005 (Jun)	Current	7	Permanent	Tax credit	Jobs and investment	Jobs	High	Refundable	Full-time	-	Headquarters	-	Yes	Yes	No
TN	Credit for hiring disabled persons	2006 (Jul)	Current	5	Permanent	Tax credit	Jobs	Jobs	High	Carry-forward	Part-time	-	-	Disabled	No	No	No
TN	Super jobs tax credit	2009 (Jul)	Current	2	Permanent	Tax credit	Jobs and investment	Jobs	High	Equal to tax owed	Full-time	-	-	-	No	Yes	No
TX	Economic development act	2002 (Jan)	Expires 2014 (Dec)	10	Temporary	Tax credit	Jobs and investment	Investment	Discretionary	Not specified	Not specified	Targeted	-	-	Yes	Yes	Yes
TX	Texas enterprise fund (TEF)	2003 (Sept)	Expires 2013 (Sept)	8	Permanent	Grant or payment	Jobs and investment	Jobs and others	Discretionary	Not specified	Not specified	-	-	-	Yes	Yes	No
UT	Industrial assistance fund	1991 (Mar)	Current	21	Permanent	Grant or payment	Jobs and other requirements	Jobs and investment	Discretionary	Not specified	Not specified	-	-	-	No	Yes	Yes
UT	Hiring persons with disabilities (Targeted jobs tax credit)	1995 (Jan)	Current	17	Permanent	Tax credit	Jobs	Jobs and payroll	High	Carry-forward	Not specified	-	-	Disabled	No	Yes	No
VT	The economic advancement tax incentive program	1998 (Jan)	Repealed 2006 (Dec)	8	Permanent	Tax credit	Jobs and other requirements	Payroll	High	Carry-forward	Full-time	-	-	-	Yes	Yes	No
VT	The Vermont employment growth incentive (VEGI)	2007 (Jan)	Current	5	Permanent	Grant or payment	Jobs and investment	Jobs, payroll and investment	Discretionary	Carry-forward	Full-time	-	-	-	Yes	Yes	No
VA	Major business facility job tax credit	1995 (Jan)	Expires 2019 (Dec)	17	Temporary	Tax credit	Jobs	Jobs	Low	Carry-forward	Full-time	-	-	-	Yes	No	No
VA	Governors opportunity fund	1996 (April)	Current	16	Permanent	Grant or payment	Jobs, investment and other requirements	Jobs, payroll and investment	Discretionary	Not specified	Full-time	-	-	-	No	Yes	No
VA	Employees with disabilities tax credit	1999 (Jan)	Expired 2002 (Dec)	3	Temporary	Tax credit	Jobs	Jobs and payroll	High	Carry-forward	Not specified	-	-	Disabled	No	No	No
VA	Tax credit for small business employers hiring recipients of TANF	1999 (Jan)	Current	13	Permanent	Tax credit	Jobs	Jobs and payroll	Low	Carry-forward	Not specified	-	-	Welfare recipients	No	No	No
MD	Job creation and recovery tax credit	2010 (Mar)	Expired 2010 (Dec)	0	Temporary	Tax credit	Jobs	Jobs	High	Refundable	Full-time	-	-	Unemployed	No	No	No

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VA	Virginia investment partnership - Major eligible employers grant (Performance grant for major eligible manufacturers)	1999 (Mar)	Current	13	Permanent	Grant or payment	Jobs and investment	Jobs, payroll and investment	Discretionary	Not specified	Full-time	Targeted	Large business	-	No	Yes	No
VA	Virginia investment partnership - Virginia investment performance grants	1999 (Mar)	Current	13	Permanent	Grant or payment	Jobs and investment	Jobs, payroll and investment	Discretionary	Not specified	Full-time	Targeted	-	-	No	Yes	No
VA	Virginia investment partnership - Economic development incentive grant (VEDIG)	2005 (Mar)	Current	7	Permanent	Grant or payment	Jobs and investment	Jobs, payroll and investment	Discretionary	Not specified	Full-time	-	-	-	No	Yes	No
VA	Small business jobs grant fund	2010 (Jul)	Current	1	Permanent	Grant or payment	Jobs and investment	Jobs and others	High	Not specified	Full-time	-	Small business	-	No	Yes	No
VA	Jobs investment program (VJIP) - New jobs program	2012 (April)	Current	0	Permanent	Grant or payment	Jobs and investment	Payroll	Not determinable	Not specified	Full-time	-	-	-	No	Yes	No
VA	Jobs investment program (VJIP) - Small business new jobs program	2012 (April)	Current	0	Permanent	Grant or payment	Jobs and investment	Payroll	Not determinable	Not specified	Full-time	-	Small business	-	No	Yes	No
WV	Business investment and jobs expansion tax credit	1985 (Jan)	Expired 2002 (Dec)	17	Permanent	Tax credit	Jobs and investment	Jobs and investment	Not determinable	Carry-forward	Full-time	-	-	-	Yes	Yes	No
WV	Economic opportunity tax credit (EOTC)	2003 (Jan)	Current	9	Permanent	Tax credit	Jobs and other requirements	Jobs and investment	Not determinable	Carry-forward	Full-time	-	-	-	Yes	Yes	No
WI	Economic development tax credit - Job creation	2009 (Jan)	Current	3	Permanent	Tax credit	Jobs	Jobs and payroll	High	Not specified	Full-time	-	-	-	No	Yes	Yes
WI	Economic development tax credit - Corporate headquarters	2009 (Jan)	Current	3	Permanent	Tax credit	Jobs	Jobs and payroll	High	Not specified	Full-time	-	Headquarters	-	No	Yes	Yes

Sources: See text.