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1. 1. In a Difference in Differences research design, we’re comparing the difference in the treatment group vs the control group. In this case, the treatment group is workers classified as having a disability and the control group is workers classified as not having a disability.   
      The main assumption for such a design is parallel trends, which is that the control and treatment groups ‘grow/change’ the same way (having similar trends) so that the difference between the two groups are constant over time. In this case, we’d need to assume that the difference in weeks worked and (log of) weekly earnings of workers with and without disabilities is not changing over time (so both are moving at the same rate and direction).  
      Violations to the parallel trend assumption may arise due to innovations in assistive technologies. As new assistive technologies emerge, workers with disabilities are more positively impacted (hence more growth in terms of weeks worked and earnings) compared to those who don’t have disabilities (they would not be affected as they wouldn’t use the technology) causing different trends between the two groups.
   2. Graphs made with binscatter on STATA. Code and graph below:  
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   3. The parallel trends assumption seems to be met for weeks worked (figure 1) because the two groups have a relatively flat trend. Although we do see a slight negative trend for disabled workers, whereas for non-disabled, its flatter (so the difference seems to be getting wider), it is marginal. Similarly, the parallel trends assumption seems to be met for log(earnings) because both groups seem to be trending upwards at the same rate. Albeit, it does seem to change towards 1995, however that maybe because of other factors (like new policies or changes in the workforce). So parallel trends seem to be satisfied for both outcome variables since the two groups trend together.
   4. The regression result from STATA

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The coefficient for *3* (the difference-in-differences estimator) is -2.49. Now for a person with a disability (i.e. *disabl1* = 1), the model says:

And for a person without a disability (i.e. *disabl1* = 0), the model says:

The difference then between the two equations (weeks worked for person with disability minus weeks worked for person without disability) results in:

From this above equation, we see that when the ADA passed in 1992 (and *post92t* goes from 0 to 1), the difference in the two groups (disabled and non-disabled workers) changes by *3* (from -20.19 to -22.68) . This means the ADA increased the gap between weeks worked by disabled and non-disabled workers by 2.49 weeks.

The coefficient has a p-value of 0.0, which means it is statistically significant at the 5% level (since the p-value is less than 0.05). Since non-disabled people continued working 40 hours, and the ADA seems to widen the gap between disabled and non-disabled workers, this effectively means that disabled workers work less weeks after ADA passed.

* 1. The regression results from STATA

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The coefficient for *3* (the difference-in-differences estimator) is -0.009. By the rationale from part a (taking the difference between groups), this means the ADA increased the wage gap between disabled and non-disabled workers by 0.09% (use percentage because we’re working with log-linear regression).  
The coefficient has a p-value of 0.7, which means it is not statistically significant at the 5% level (since the p-value is more than 0.05). Since the coefficient is not statistically significant, we can conclude the ADA did not have impact on the weekly earnings for the disabled.

* 1. From the analysis in part (a) and (b), I have to conclude the ADA was harmful for the employment outcomes for the disabled. In both cases, the gap widens between the disabled and non-disabled labor force (less equality between the two groups), and the disabled worked less weeks after ADA passed.

1. 1. The regression results from STATA

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* 1. Figure produced below:

A close up of a map

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* 1. Before the policy in 1992, we see the trend for differences between the two groups is flat, as from 1990 to 1991, there appeared to be no change in the difference of weeks worked by the two groups. However, after ADA passed in 1992, we see a negative trend in the difference in the weeks worked by disabled vs. non-disabled workers, meaning that disabled workers worked less weeks. A potential reason for this is that ADA may have increased the income effect for disabled worked. With the ADA banning discrimination against disabled workers, disabled workers may have gotten access to higher paying jobs, thus becoming richer, and then via the income effect, working less. Thus, the above graph could be the result of this income effect boost from the ADA (this would make sense with figure 2, which shows a positive trend in *log(Weekly Earnings)* for disabled workers).
  2. This type of graph is helpful in assessing the parallel trends assumption because it directly measures the differences in the outcome variable between the two groups. In the Figure 1 and 2, we first need to find the difference of each group from before and after the event/time, and then compare those differences. Whereas in figure 3, we have the differences between the two groups already, and can take one difference using the before and after event values. We can check for the parallel trends assumption by seeing if the line stays at constant value while in the before-event period and while in the after-event period (because it would imply the two groups trend together since their differences don’t change in either period).