Childhood economic shocks and adult wage effects

by

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Abstract

Early childhood shocks and the long-run implications of them have been of great research and policy interest. Even though a large body of literature has analyzed medical shocks and a variety of outcomes, research on how economic shocks affects the individuals later life economy has been limited. Using repeated cross-sectional data from Integrated Public Use Microdata Series for USA (IPUMS USA) for individual characteristics matched with Bureau of labor statistics (BLS) state unemployment records for individuals born between 1977 and 1990 effects of fluctuation in unemployment on adult wage are measured. Fixed effects are used for birthyear and state of residence to control for differences between cohort and states wage heterogeneity driving results. The results indicate a positive effect of additional 0.0018 wage log point per change in unemployment percentage point for the whole sample. When looking at heterogeneity in the results the interpretation seems more ambiguous as the effect is visible for adults up until thirty especially for groups particularly exposed to recessions during the time. In order to arrive at general wage results for the whole lifecycle more data is needed on elder individuals. Overall, the results suggest an effect and changes in labor market activity caused by economic shocks in early childhood. More research and policy evaluation seems warranted for providing more flexibility in labor and financial markets for families with children in early childhood.

Keywords: Early childhood shocks, wage effects, Labor economics, Health Economics, Fixed effects estimation, IPUMS USA

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Table of Contents

Introduction

A large body of evidence has emerged regarding early life shocks and the impacts they have over the course of the life cycle. In the field of health economics an interest has emerged for estimating latent effects of biological shocks and their later life outcomes. Major contributors like Case, Fertige and Paxsson (2005); Van den Berg, Gerard and Lindeboom (2006); Almond (2006); Almond, Currie and Duque (2018) joined by a host of health economists have explored later life medical effects from early utero or childhood shocks. Other studies since the start of the millennia have varied origin of shocks and dependent outcome variable leading towards investigating not only health shocks per se but shocks of more social character.

A recent study like this one by Kesternich, Siflinger, Smith, and Winter (2015) has investigated economic conditions in childhood by looking at cohorts in post-world war two Germany exposed to the effects of war. They estimate long-run effects of more severe trauma like war on socio-economic status while this study looks at economic shocks in the form of change in parental unemployment levels effect on future wage. Further, while Kesternich et al. (2015) used a merger of country-level macro data and a survey conducted after the war this study has access to a single dataset of individual level repeated cross-sectional data. Even though there is extensive literature around the topic there is no to the author known literature discussing long run economic effects from economic shocks on the individual level. The economical relevance of early life shocks is substantial as early economic support towards parents and children might be a more cost-effective alternative for policy-makers relative to support systems later in life.

This study use data from Integrated Public Use Microdata Series for USA (IPUMS USA) to investigate how changes in the employment rate in early childhood affects the child's future wage. IPUMS USA is based on the yearly cross-sectional ACS survey of US households which provides survey answers from a representative selection of the US population. This can then be matched with data from Bureau of labor statistics (BLS) to investigate how changes in the employment rate on state level around birth effects grown up wage up until the chosen cut-off points.

The data is used to investigate whether yearly net wage is affected by a created variable of how much unemployment has changed before, during and after birth to analyze if

and when fluctuations in the unemployment rate at state of birth affect future wage. In line with previous research of Van den Berg, Gerard and Lindeboom (2006) a macrolevel shock is used as that is considered to be exogenous at individual level. To deal with endogeneity related to adult geographic status and time of birth a fixed effects model is used. The unobservable individual characteristics creating potential bias is then restricted to migration between states as wage differences depending on current state is differenced away. Therefore, migrants are analyzed to see they are not driving results.

The basic findings of this study is a positive effect on the logarithm of the individuals wage from economic shocks in early childhood. The main result is an additional 0.0018 log point per change in unemployment percentage point up until age five. Note that the positive effect on the logarithm of wage comes from the *change* in unemployment, regardless if the change in the unemployment variable is positive or negative a larger change yield a more positive average wage all else equal. An example would be to consider three individuals. One experiencing a positive five percent unemployment shock and another experiencing a five percent negative shock. Both would have the same relatively higher average wage compared to the third individual experiencing a zero percent change in unemployment level.

Before birth, no significant effect can be found but as soon as the individual is born result move from negative with at best low significance while in utero to positive with high significance during the first five to ten years of life. The magnitude of effects found vary substantially depending on ethnic group, sex and migration status between states. In general non-whites, men and non-migrants experience significantly larger and longer effects. The results are robust due to a lack of effects before birth excluding the possibility of other shocks unrelated to the individual driving the results. The robustness and heterogeneity of the results is in line with which groups where mostly affected by economic fluctuations during the time. The positive effect is experienced by those in the early stages of their labor careers in their twenties, the results moves towards zero and negative for older individuals.

The specific mechanism causing the wage effect seems to be through an increase in the amount of time worked. Why the number of weeks worked last year increase cannot be answered directly by results from this study but there are two major ways it can work through. The effect might be due to a change in the labor consumption choice of the household or child taking up relatively more work. It could also be due to the economic shock changing characteristics not included here like health that subsequently later affect the amount of time worked and therefore yearly wage. No significant effect can be found on education but more

data on older respondents is needed to say something about lifetime wage. Results encourage further research and policy evaluation about more flexible working schemes or redistribution to families during early childhood.

The remainder of the study is structured as follows. The next chapter, chapter two, contains a literature review where previous literature regarding early childhood shocks are discussed. Chapter three moves forward with data review and empirical strategy. Chapter four presents results, robustness checks and discussions. Finally, chapter five concludes study.

Literature review

Even though there is, as known to the author, no previous study regarding the subject early childhood economic shock effects on later life wage there indeed is a substantial amount of research closely related to it. Therefore, the literature review starts with a summary of childhood shocks within health economics and main alternative views to the models presented in health economics. This is important to present a foundation for how childhood shocks have had long lasting implications on children even though previous evidence have primarily been medical. Thereafter comes the second part of the literature review regarding labor supply, consumption theory and how socio-economic shocks have been seen to affect individuals both short and long-term. This to lay a theoretical foundation for how wage is formed and how an economic shocks can be expected to affect wage in the long run. Finally, a review of the institutional setting the individuals have been born into is made to conclude the chapter.

Early life shocks and health economics

The foundations of Health Economics view on demand for health stems from Labor economics and is primarily first seen when Grossman in 1972 formulated a model where health can be considered as a stock. A simple example would be where the individual invests by exercising and divesting by drinking alcohol or smoking cigarettes trading health stock for the instant high. Grossman (1972) states in the first two pages of his work that the framework of health stock builds upon the prominent labor economist Becker's (1964) theories about a human capital stock where health for example can be an input factor in human productivity (capital).

These models in their original form have in common they are in stark contrast to the idea that shocks to the stock can affect the stock permanently. Childhood shocks for instance as discussed in this study should not be notable in the long run. Individuals continuously build

and consume their new health or human capital stock; it depreciates successively and therefore renews itself according to the pace of investment. The Grossman model of health demand have since been extended by the likes of Phelps (1976) adding uncertainty to the model or Ehrlich and Chuma (1990) extending the model with a depth for the assumptions about linearity in health investment and therefore the necessity for so called ”bang-bang” controls to optimize health capital functions.

The model has from the start been criticized for several reasons. One early criticism made by Cropper (1977) questions both preventive care and illness being included in the same model as illness is more random and highly correlated with higher age. Illness is therefore not a direct investment decision as preventive care can be considered to be. Another critique by Cropper (1982) had to do with the model setting health as a dichotomous choice. Health is always simultaneously good and bad and therefore cannot be perceived as distinctly either or which is the core trade-off in the Grossman model. Later critiques by Fuchs (2004) pinpoint the collinearity between some variables in the model such as income, wage, education, socio-economic status, and occupation status. Specifically, jobs with high risk premiums make for high co-dependence in the tradeoff choice between wage and health.

Other fields like medicine and psychology developed a set of theories around the shift of millennia called life course epidemiology. Though not quantified or formalized in an equation the epidemiological theory can be described in four general models according to Kuh, Ben-Scholmo, Lynch, Hallqvist and Power (2003). The first two centers around accumulation of risk. They state that life course exposures or insults as they are also called gradually accumulate through for example illness, injury, adverse environmental conditions and health damaging behavior. The purpose of life course epidemiology is therefore to test in what extent cumulative damage to biological systems (human health in our case) affect the system as the body systems grow older and lose its ability to repair itself. The exposure can be in more social form as well like environmental, socio-economic behavioral and may cause long-term damage. If the exposure risk is independent the model can be represented like model a in figure (1) found on the next page and if it is clustered it can be represented as model b in figure (1).

The other category of models is called chain of risk models being different from the previous ones as it assumes one exposure leads to the next and so on. As example sickness heightens the risk of new sickness due to a weakened immune system and therefore creates a chain of exposure. This can of course work in both ways as good health exposure may lead to

less risk of sickness likewise. This category can also be divided into two different models depending on if each exposure also affect the general risk of falling ill like model c in figure (1) or if it only affect the next exposure like model d in figure (1). The Grossman model described previously would fall under model a as it assumes all exposure or change to the health stock directly alters the health stock, there is no room for models where the shock continues to affect the individual permanently. That would go against the idea of a simple individual choice of altering the capital stock at any given time.

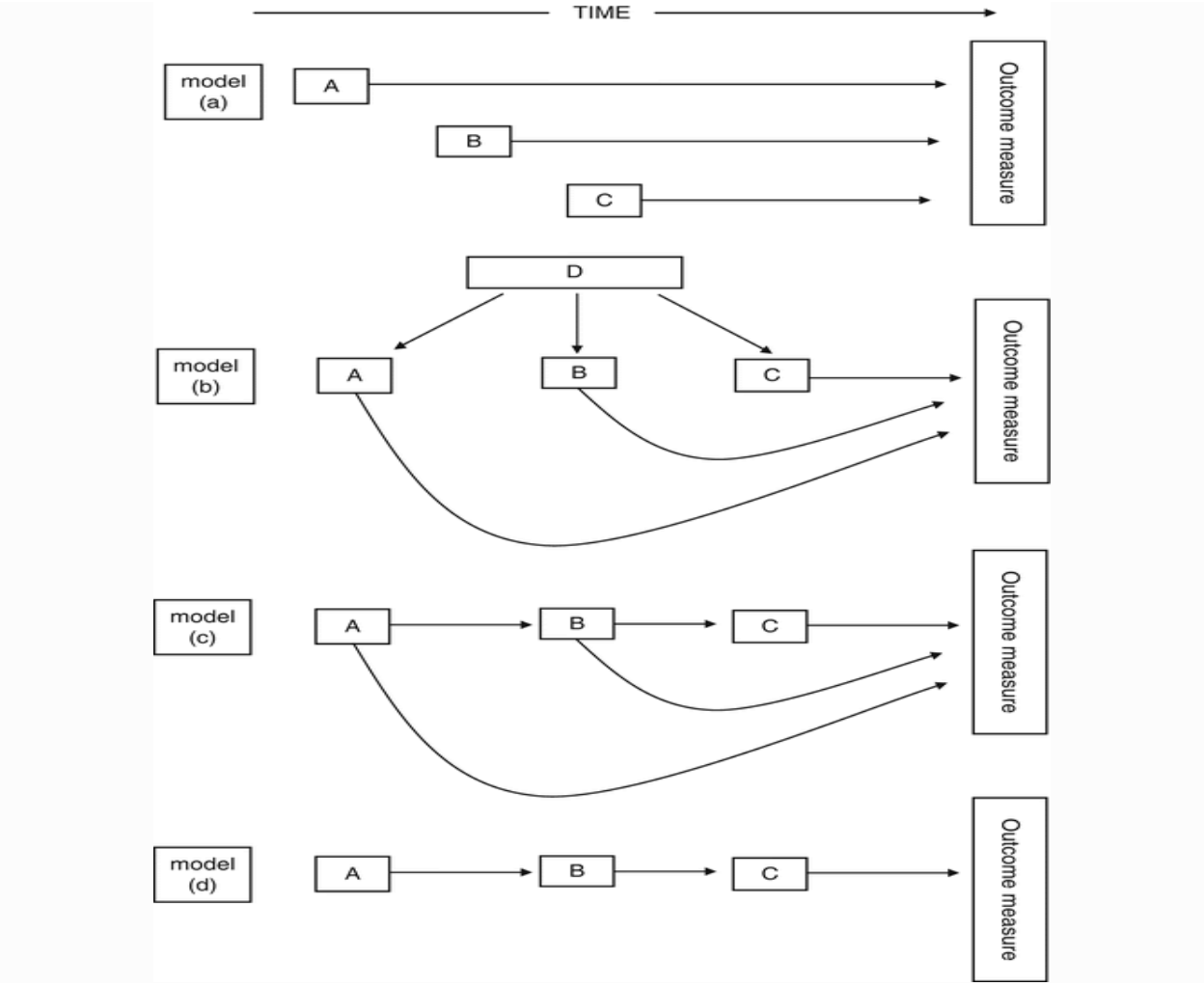


Figure. 1 Taken from Kuh, et al (2003). Graphical illustrations of various life course models: (a) accumulation of risk with uncorrelated exposures, (b) accumulation of risk with correlated exposures, (c) chain of risk additive model, and (d) chain of risk trigger model.

For this study, the most important critique of the Grossman model within health economics similar to life course epidemiology came in 2006 when Almond challenged the view of non-lasting effects. The author does this by investigating the lasting effects on the cohort born during the devastating influenza of 1918. This cohort survived one of history's

most deadly pandemics while in utero and what Almond could show using a regression discontinuity design was that this cohort had on average lower later life outcomes. The timespan of the pandemic was so short the author argued that there should be no unobserved differences between cohorts just before or after and cohorts born during the influenza. The outcomes were for example wage, amount of schooling and socioeconomic status measured at the IPUMS census of the 70: ties, 80: ties and 90: ties indicating effects from this shock visible over an entire life cycle.

Almonds use of a sudden exogenous shock builds upon at the time recent literature by Van den Berg, Lindeboom and Portrait (2006) estimating the effect of fluctuations in GNP in the Netherlands on mortality later in life. They argue that at the household level macro variables like GNP are exogenous and can therefore be used as a random treatment. They find while controlling for period born that people born during a recession have a eight percent higher mortality rate after the first year of life. They run further robustness tests in order to exclude the possibility of results being driven by child mortality. Predeceasing Almonds work from 2006 is also Case, Fertige and Paxsson (2005) as they are estimating the lasting impact of childhood health. They find lasting effects on health and socioeconomic status in their results though it should be noted as is by the authors their reliance on household health variables. These variables cannot be considered exogenous and the authors therefore use almost 200 controls to try eradicating as much bias as possible.

Similar later studies on early childhood medical shocks like Almond, Edlund, and Palme (2009) analyze schooling performance effects on cohorts born in Sweden during high radioactivity following the Chernobyl disaster. They use a difference-in-difference design utilizing fallout hitting different municipalities at different times. A threat to their design was if unobservable characteristics of families would deteriorate in 1986 meaning treatment would be correlated with family characteristics. To solve this, they run a sibling-fixed effect removing heterogeneity bias across families. This ensures no unaccounted shock affected all families at the time and hence effects both exogenous and dependent variable. They find a clear deviation from the trend for children born during time and place of high radioactive levels.

Another work regarding how economic shocks can have latent medical effect on children is Adhvaryu, Fenske and Nyshadham (2019) study of a birth cohort in Ghana and their economic conditions in early childhood. They use as the difference-in-difference design creating an interaction variable if an individual's region during early childhood produced

cocoa and how much the cocoa price fluctuated during early childhood. To try to remove bias from unobservable characteristics they run regressions with family fixed effects to eliminate unobservable characteristics across families. Their results suggest that one standard deviation increase in Cocoa price during early life leads to a 3 % decrease in the likelihood of severe mental illness in areas dependent on Cocoa compared to other regions.

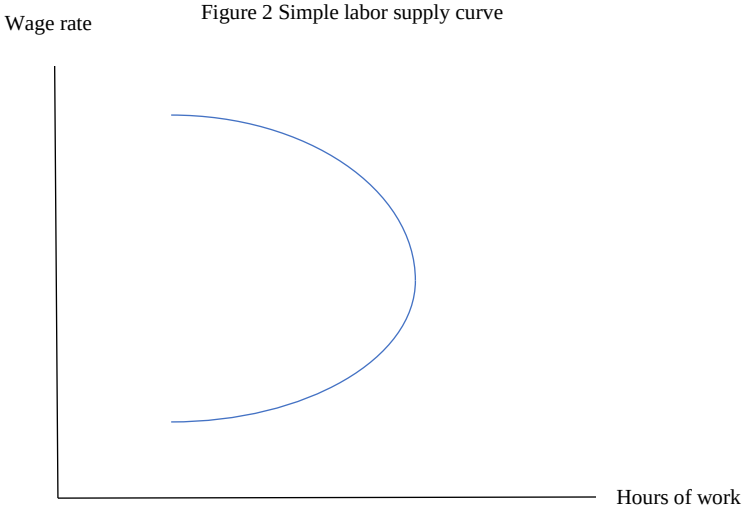
The more general economic relevance of early life treatment has to be stressed. In the recent meta study by Almond, Currie and Duque (2018) different sorts of effects on childbirth are compressed and create an overview overlooking different types of shocks. Examples like a 10 percent increase in annual income at age 5 leads to a 0.4 SD increase in test scores (Black, Devereux, Løken & Salvanes., 2014 cited in Almond et al., 2018) or a 1-month increase in psychosocial stimulation in early-life leads to a 1.75 percent increase in wages (Gertler., 2014 cited in Almond et al., 2018). This study therefore contributes new research to the field by exploring economic shocks to the household environment in childhood and its potential future economic costs. The task of analyzing economic shocks and future effects on individuals wage has not, at least known to the author, been done before. The results should be important for the ability to conduct further research and possibly future policy evaluations about hedging individuals against these unexpected events. Very much like Almond et al. (2010) have had effects on providing better *medical* safety nets for newborn families the larger purpose of this study is exploring the viability of better *economic* safety nets for newborn families.

Labor supply, life-time consumption, and economic shocks

In trying to predict how an economic shock would affect an individual's wage in the future a foundation for how individuals affect their wage is needed. An individual's influence or lack thereof over the wage rate can be divided into primarily two major areas. One is through perceived characteristics affecting the sort of jobs available. Chapters in Ehrenberg & Smith (2011) dedicated to characteristics effects on wage is centered around education, migration, gender, race, and unemployment. These determinants of wage are only important to this study in that an early economic shock might affect important wage determinants like these or other determinants. These effects should then show in the data, for example if the shock affects educational attainment which in turn has been proven to affect wage. The shock cannot affect discrimination in wage setting like ethnic belonging or sex as those characteristics are predetermined.

The other way for an individual to influence wage is the choice of if and to what extent working and earning wage. This can be seen as a consumption choice between wage and leisure. The agent according to labor supply models like presented in Ehrenberg & Smith (2011, pp.172-175) states there are two forces affecting the choice, the substitution effect, and the income effect. The substitution effects have a positive effect on hours worked from a higher wage and is strong at first. The income effects on the other hand have a negative effect from more hours worked and is stronger for a higher wage. This has the effect of the labor individual demand for working often being U-shaped, see figure 2 (Ehrenberg & Smith, 2011, pp.172-175). This means two different wages can make the same individual work the exact same number of hours, but these wage levels are unlikely to be close to each other if not particularly close to where the curve inverts itself. One can test if individuals are on the lower or higher end of the curve by simply estimating in what direction both wage and time worked goes. The theoretical importance for the study here is not the particular trade-off leisure against wage but the trade-off choice between leisure and some sort of time, effort, or risk.

Figure 2 Simple labor supply curve



A theory explaining how early life economic shocks could affect this consumption more long-term future can be found through the permanent-income model by Friedman (1957) and life-cycle model by Modigliani (1954) for consumption. In the life-cycle model, an increase in income expected to be permanent will cause a large increase in lifetime wealth and therefore a large increase in consumption, labor consumption in this case. The marginal propensity to consume (MPC) is therefore near one as long as the change is considered permanent by the agent. In our case the agent is the household and particularly the child in it.

A temporary increase or shock to the income on the other hand would only affect the current period and possibly nearby periods. This means the economic shock would not change expected lifetime earnings considerably and should therefore not alter consumption considerably. Note consumption in our case is primarily labor consumption, how much or hard one wants to work to achieve wage. Thus, the MPC for temporary changes in the life-cycle model is much smaller and should be close to zero given a long life-expectancy (Modigliani, 1954). The permanent income model works the same way for permanent changes with MPC and further assumes temporary shocks to have a MPC even closer to zero. The extra income would be put into saving and the extra yearly rate would be consumed annually. As the permanent income model assumes infinitely lived households this one-time increase spread over the infinite life cycle becomes arbitrary close to zero as time goes towards infinity (Friedman, 1957).

These two theories and how unexpected income shocks affect consumption have been tested with some mixed results. Flavin (1993) tested this by examining to what degree consumption changes directly after unexpected economical household shocks and found excess sensitivity compared to the models. Changes in income seemed to cause consumption to change in contrast to what the original models predicted. A possible explanation for this put forth by Campbell, Mankiw (1989) and Shea (1995) is that some households may have liquidity constraints and therefore cannot efficiently smooth their lifetime consumption through the debt market. For this study it would entail effects on wage signaling individuals changing consumption behavior long after the initial shock. This would according to theory stem from inability to smooth consumption by affording or even having access to the loan market. These children and their families might therefore consume all their assets without ability to loan during negative shocks or not being able to save during positive shocks therefore forcing them to an undesired consumption level.

Analysis on economics shocks short term effects on household conducted by Christelis, Georgarakos & Jappelli (2015) at the European central bank analyze the effects of wealth and unemployment shocks on household consumption in the wake of the 2008 financial crisis. Using a stochastic intertemporal model, they find direct changes in consumptions from transitions in unemployment during the period. Especially the significant consumption effect on retirement points to a lack of intertemporal consumption smoothing. They also find a larger household debt and therefore less ability to smooth consumptions is significantly correlated with change in consumption during the time. They conclude their

results imply the need for higher housing and stock prices along with improved job market are needed to increase US household expenditure, especially at a time when household may desire to save more. They also conclude the process is unlikely to be brief due to the amount households lost during the Great Recession (Georgarakos et al., 2015).

Another study estimating long term social effect of more extreme childhood environmental shocks is Kesternich, Siflinger, Smith and Winter (2014) as they estimate the effect of being an exposed child in post-world war two Germany. Even though not similar to this study in setting or type of social shock the objective lies in trying to connect socio-economic shocks in childhood to social later life outcomes. Using a retrospective survey conducted in 2009 where respondents answer questions about their childhood, they estimate a fixed effects model of how those suffering war consequences fare in later life. They find clear patterns for those affected by the war through experience of dispossession, persecution, combat in local areas and hunger periods have lower socioeconomic status and health when older.

Institutional setting

A good period to study for the purpose of this study is around the double recessions in the early 1980: ties as it represents both a downturn and recovery period of the US economy. During the first nine months of 1979 the CPI jumped from an average 8 percent to 10.75 percent. This made the federal reserve raise the interest rate from 11.5 percent to at its highest 17.6 percent in April 1980. This forced the economy into a recession officially starting in January 1980 that raised the unemployment rate from a relatively stable 6 percent to 7,8 percent in August 1980 (Walsh, 2004). Even though the economy officially came out of recession and into expansion in 1981 it only seemed to affect the white populations as unemployment for the black and hispanic population continued to rise. This meant that the general unemployment level remained relatively unchanged until July 1981 when the next recession hit again due to raised interest rates. This time the unemployment level rose with 3,6 percentage points to a total of approximately 11 percent before recovery began (Gardner, 1994).

The regional unemployment rate varied substantially depending on area during the 1970 to 1982. Even when national unemployment was relatively low for the period in 1979 at 5,8 percentage points some areas had as high as 40 percent while others as low as under 1 percent. At this period as many as 89 counties had unemployment rates of 12 percent or more

and 107 had between 10 and 11.9 percent (Rosen, 1984). This indicates a wide distribution during the period and not only single extreme outliers.

The sectors affected varied substantially as well. During the 70: ties in the US overall employment rose by 28 percent though growth rates varied. Manufacturing for instance increased less than 5 percent while mining employment increased by 65 percent. Note that this is overall employment hence a lot of the increase is due to population increase, not necessarily a better fraction of the population employed. The latter part of the century and start of the next decade saw a change in trend. Between 1979 and 1982 the job growth was nearly at standstill due to two recessions and non-agricultural employment declined 0.3 percent. Decreases in non-agricultural jobs were recorded in 28 states during the period while growth in the remaining states was well below 1970 to 1980 average (Rosen, 1984).

Moving forward into the 80: ties the US experienced a long recovery of growth but here also the variance is large between industries and regions. The fastest growth was in the service sector accounting for half of all jobs created during the 80: ties. Construction increased by 19 percent although almost all other goods producing sectors saw declines in the amount of jobs. Mining for example had increased by 65 percent in the 1970: ties now lost 25 percent of their jobs during the subsequent decade. This of course entails differences between states in the amount of jobs produced depending on state specialization (Rosen, 1984).

All this volatility should create substantial variance in the exogenous variable of interest and as one can see in graph (1) there are both climbs and falls in average employment level when born of approximately equal size during the period of interest.

Graph (1)

At household budgetary level the extra cost associated with having a child compared to a childless couple varied substantially depending on family characteristics at the time according to Edwards (1981). For urban children in 1980 dollars the low group initial cost range between $ 1570 and $ 2485 annually. The budget group range between $ 2085 and $ 3450 and the moderate cost group range between $ 3255 and $ 5210. The cost rises successively during the upbringing of the child with a total difference in cost of about $ 1000 for all groups. The same pattern can be seen for rural estimates. This entails the largest change to the annual household budget during the 1980: ties come at birth when cost goes from zero to an annual average of $ 2000 overnight for the lowest urban group (Edwards, 1981). This most likely make early parents household budgets more strained than parents later in childhood development as early parents have not had time to adapt their finances according to the extra cost incurred by a child.

Data and empirical strategy

The chapter starts with a review of the data used and key parts of the data providers data gathering methodology. Thereafter empirical strategy follows to analyze the questions and the chapter is concluded with specifications.

Data review

The data for individuals is drawn from IPUMS US and contains American community survey (ACS) microdata for social, economic and health research (IPUMS, 2020a). The surveys are conducted in the same manner between the sample years 2005 to 2018 with exception for two notes making the dataset repeated cross-sectional. IPUMS (2020b) firstly states that 2005 was the last year the data did *not* include persons in group quarters, i.e. student dormitories, military barracks, group homes, missions or shelters. All other survey years between 2006-2018 include group quarters. Secondly in 2017 data collection where temporary suspended in parts of the country due to hurricanes, this may lead to higher margins of errors in impacted areas. Apart from these minor notes the structure of the samples is according to IPUMS identical with ACS-surveys containing 1-in-100 weighted random sample of the population. The ACS surveys are mailed at the beginning of the month of the given year. Non-respondents are contacted one month later for a telephone assisted interview (CATI) while a third of the non-respondents after the second phase are personally contacted. The personal contact also conducts the same computer assisted interview. A substantial amount of work is therefore conducted by IPUMS to minimize selection bias.

The dependent variable of interest for later life performance is the self-reported logarithm of wage income during a year. Included in the variable is all income from work. The name for the income variable in the IPUMS data is incwage and is described as pre-tax amount of USD earned during last year. The choice of taking the logarithm of said variable is particularly due to the skewness of wage as extreme values at the upper end gives unrepresentative averages with a zero bound. Further expecting individuals to care about percentile changes in wage seem more reasonable than the nominal value, i.e. the assumption that the same nominal amount of wage increase has less utility the higher the starting wage. Covariates of interest are Duncan socioeconomic index (SES), employment status, birth year, quarter of birth, educational attainment level, weeks worked last year (interval), sex and ethnicity. The names of these variables in IPUMS are ses, emptat, birthyr, birthqt, educ, wkswork2, sex and race respectively. The coding is intuitive for all variables except empstat which is coded positively the further from the labor market one is and therefore one expects this variable to have a negative effect on wage. A list of variable names, code names and coding can be found in Codebook A1 in the appendix.

Looking at the summary statistics table A2 divided by segments of in what way employment changed during the first five years one can see differences in mean outcomes. The logarithm of wage is lower in segments close to zero compared to further from zero which can be seen in column (2)-(5). No other characteristic varies in the same structural manner as log wage and other means are similar regardless of group with random variation in line with the magnitude of the standard deviation in parenthesis beneath.

To obtain a value for the unemployment changes at and around birth the data first have to be matched between individual variable birthplace in the IPUMS US data and state unemployment level for given years and quarters from BLS. The unemployment rate in the individual's birth state at any given time is obtained by standardizing state unemployment data according to the same year-quarter structure by averaging monthly unemployment level data to quarters. IPUMS data standardize 1960 as year and quarter zero (IPUMS, 2020b). Matching all individuals with their respective employment at birth depending on birth state is then simple. These variables can be other than time of birth per se, for example five years after birth (matching our individual to birth state and birth-quarter 65+20) or matching towards birth trimesters (birth-quarter 65-{1,2,3}). To calculate the variable of interest, *change* in unemployment at any given point is then only a matter of subtracting variable unemployment at birth with interval of interest.

An example would be a person born in 1976 which is year-quarter 65. The objective for the sake of the example is to calculate this individual's change in birth state unemployment from birth to five years old. If our individual was born in Arizona this would mean January-Mars of 1976 of Arizona's monthly employment levels are averaged to get Arizona's unemployment level for year-quarter 65. This unemployment level would be our individual's employment rate at birth. The procedure is repeated for Arizona year-quarter 85 as that is exactly five years later. The change in unemployment is then merely a subtraction between the two unemployment rates obtained. Note the assumption of the person having stayed in Arizona during this time and therefore analysis of migration has to be done when checking results robustness.

The data for state level unemployment is gathered from the Bureau of labor statistics (2020a). The estimates for monthly unemployment on state-level are computed by the BLS since 1976 from the underlying Current Population Survey (here forth CPS). The calculations are mainly derived from the CPS, the household survey that is the source of the national unemployment rate. Other sources are also used like the CES program, State UI systems, and the ACS (BLS, 2020b). Note that ACS is the same survey where the individual variables are taken from. A graph of mean employment when born can be seen below in graph 1, for an overview of descriptive statistics see Table A1 in the appendix.

The data has been limited to people born between 1977 and 1990 for two reasons. Firstly, BLS started estimating state unemployment levels in 1977 setting a lower timeframe for the data and secondly the period covers a symmetrical up and downturn in unemployment as can be seen in graph (1). The second point avoids results being driven by the change only going one direction. Further unemployment data is gathered for the state unemployment between the census years of the IPMUS USA microdata to be able to control for current unemployment at the state of respondent's residence. A result of this is that immigrants to the US are excluded from the analysis as the target is the economic setting at birth. Another direct effect is that the oldest individual in the data is 41 years old as 1977 is the earliest birthyear, this makes the average age substantially lower and less representative for society as whole than would be if unemployment data could be matched towards all individuals born prior to 1977 as well. In total the merged samples contain 5 496 372 individuals, as seen in the tables the preferred specification contains 4 015 611 observations due to missing values in the variables. This represents 27 percent of all individuals not being considered in the regressions

due to missing values which is not ideal, therefore inference can only be done concerning responding individuals.

Empirical strategy

The methodology for measuring early childhood shocks have been centered around avoiding selection bias and endogeneity. Therefore, a key for a sound research strategy is an exogenous shock uncorrelated with family characteristics and a shock that affects all in each sample. Unemployment levels and changes to the same affect all in an area the same regardless of employment status, the possibility of getting a job changes regardless of other characteristics. This is more in line with the ideal research designs presented in previous literature by the likes of Van den Berg, Lindeboom & Portrait, (2006); Almond (2006) where the shock is beyond control of the family. This avoids getting into discussions of emitted variable bias like Case, Fertige & Paxsson (2005) as treatment is unilateral for the whole region of choice. The trade-off is on the other hand specialization as unemployment is often measured at best at state level and therefore potential effects are expected to be small, if any. Rapid employment shifts within industries would most likely yield stronger results though, the more specialized, the more individuals have influence over those employment changes hence the trade-off. For this study to distinguish heterogeneity in effects depending on sample groups along with a large total dataset is therefore key. This also enables the study to investigate if certain groups like migrants between states, sex or ethnic groups drive the results entirely. Endogeneity in general will neither interfere with results as the sample individuals' characteristics cannot determine unemployment.

Even with the problems above solved a measurement of individuals ceteris paribus is impossible. The linear dependence of period, age and cohort implies changing cohort also implies changing age or period (see Hall, Mairesse, and Turner (2005) for a recent survey and treatment). As age and period are highly correlated with wage the comparison falls apart. Further, cohort effects tend to be smooth making it particularly hard to measure deviance from these effects in for example wage during a lifetime without accounting for cohort differences. To deal with this problem this study uses fixed effects for birth cohorts and for state of residence. Using state of residence as a geographical fixed effect avoids wage heterogeneity between states driving results.

With fixed effects estimations comes more severe implications of measurement errors (Angrist and Pischke, 2009, pp. 225). This is not possible to analyze by looking at the data

without arbitrary guesses about the validity of a datapoint being made. Instead a reliable dataset must be chosen with high credibility and with thorough data gathering methodology.

Specifications

The question at hand is the impact of early childhood economic shocks on later life performance. The primary specification is given by:

$$Y_{ist} = \beta * C_{i,s,p} + \chi'_{i,s,t}\gamma + \delta_s + \eta_t \ + \varepsilon$$

Here Y_{ist} is the natural logarithm of yearly wage for person i in state s at year t. C measure the change in unemployment level in state s for individual i during period p. The period function p(U) = $U_{i,s,t+\epsilon} - U_{i,s,t}$ measure the change in unemployment for individual i in state s during the period $t, t + \epsilon$ for an ϵ of interest. Linear change in unemployment is used and the starting period of reference is change from birth until the age of five. This would make p(U) = $U_{i,s,5} - U_{i,s,0}$ and therefore produce the change in unemployment at state level s from birth of individual i to the age of five for individual i.

The unit of time t is measured in yearly quarters. This is of course not optimal as there can be almost a whole trimester of deviation depending on if an individual is born early or late in a trimester, but it is as accurate as possible given the sample variables. $\chi'_{i,s,t}$ is a vector of controls for performance in the form of schooling attainment level, age, Duncan socioeconomic index, sex, race and employment status. δ and η are fixed effects for state of residence s and time of birth t. The standard errors will be clustered at fixed effect level (current state) as recommended by (Angrist & Pischke, 2009, p.316). The empirical strategy intends to establish a causal effect of economic shocks during early childhood to later life wage. The strict exogeneity assumption that must hold for a causal interpretation can be written as follows:

$$E[\varepsilon_{it} \mid X_{i1},\ldots, X_{iT,}\eta_i] = 0$$

The assumption in this study assumes parents cannot predict fluctuations in employment nine months in advance at household level, note *fluctuations* and not approximate unemployment level which can be predicted. Further shocks that affect both the exogenous and dependent variables would likely break the assumption which is key for the empirical strategy. To test if the strict exogeneity assumption is violated robustness checks are included for changes before birth, they should not follow a similar pattern as main results as that would indicate unaccounted shocks affecting both exogenous variables and outcomes.

One heterogeneity problem faced with measuring wage and earnings in general is it will be unrepresentative due to education when measured during the cohort members 20: ties and possibly early 30: ties. This is very well illustrated in Tamborini, Kim and Sakamoto's (2015) work tracking lifetime earnings for a single cohort during their whole lifespan. Cohort members educating themselves have longer time until they start their wage progression and therefore might catch up and surpass their less educated cohort piers at a later point. In the study by Tamborini et al. (2015) a clear pattern can be seen of men's wage peaking around 45 regardless of educational background. Another issue with earnings in general is the heteroskedasticity of earnings plotting it over a lifetime. Wage measured for cohorts in a later stage of life can be expected to vary more as career paths and therefore wage diverge resulting in higher residuals using the same variables and less explanatory power. These two points combined highlight the importance of measuring wage at different stages in life. Therefore, robustness checks will be made looking at age heterogeneity in results. Likewise, heterogeneity in results regarding sex, ethnicity and migrating from one's birth state will be analyzed.

To conclude the robustness analysis covariates will be analyzed to see if results are driven by changes in covariates according to the specification:

$$Y_{ist} = \beta * C_{i,s,p} + \chi'_{i,s,t}\gamma + \delta_s + \eta_t + \varepsilon$$

The difference from the specification above is Y_{ist} is now for example employment status. Additionally, only the predetermined controls sex and race are included to avoid all form of potential heterogeneity in the robustness checks. The exact same analysis will be done for schooling and socio-economic status as all of these variables run the risk of being considered bad controls. A bad control problem would mean these controls would be significantly affected by the change in unemployment as well. Finally, the exact same regression is run for interval number of weeks worked last year to confirm that the change in wage derives from a change in time worked. The computer software used for all analysis in this study is STATA.

Results

The chapter starts with the main results followed by robustness checks. Tables included within the chapter is deemed most important for main results and robustness checks, remaining tables can be found in the appendix. The chapter is concluded with a discussion and plausible explanations for the results.

Main results

The main results from the primary specification (1) including all controls can be seen on the next page in table (1) column (5). A one percentage point *change* in unemployment level when born seem to increase the yearly wage earned 0.00183 log points at a five percent significance level. To put this into context the constant is at 10.75 log points translating to a yearly wage of $46 630 per year. Given that the unemployment changed five percentage points during the first five years of life the wage would instead be 10.75 log points plus five times 0.00183 log points equaling 10,75915 log points or $ 47 059. This would be a positive difference of $ 429 a year. Assuming a working career of 25 years and for the sake of the example this to be the average wage during the lifetime this would amount to a difference of $ 10 725. In order to see if the results change substantially column (1) to (4) successively add more controls and fixed effects to the regression. Note as said in the previous chapter the shock is not the unemployment rate but the *change* in unemployment rate, therefore both a positive and negative change would increase wage the same amount by 0.00183 log points.

In Table (1) column (6)-(9) one can also see effects up until five years of age and how the results are significant for two years after, three years after and four years after. The perseverance of significant effects from two years after until four is important to highlight the main results not being randomly significant. In Table (A3) column (1)-(5) average effects until ten seem to be similar in magnitude at 0.00209 and the change in unemployment between five and ten years of age in column (6) have a lower insignificant average at 0.000518.

Analyzing result heterogeneity for sex, change in unemployment after birth can be seen in appendix table (A4). It seems men are driving the whole sample significant average results for change until five years old with a 1 percent significant positive effect at 0.00206. Women have a slightly lower average at 0.00158 but insignificant. Looking at the change until ten years of age the results for both sexes are very similar at 0.00213 and 0.00197

although both insignificant just as the main results for change until ten years. Looking at five until ten years old results are just as the main results almost indistinguishable from zero.

Moving on to the heterogeneity analysis of ethnic groups results are presented in Table (A5). One cannot distinguish any significant effect for whites though still positive at 0.00129 for change until five. The same insignificant patterns as above can be seen for whites regarding change until ten and change between ten and five. Analyzing the effects for blacks is a different story. At a one percent significance level ethnically black have positive effect of 0.00494, more than twice the average results for the whole sample. Also change until ten years old is significant at a one percent level at 0.00481. Change five until ten years old is still undistinguishable from zero. The results for other ethnicities than black or white is somewhere in between the formers. The group have an effect of positive 0.00189 at a five percent significance level and the other two intervals follows the same pattern as above and are both insignificant.

Results concerning age heterogeneity can be found in Table (2) Column (1)-(5). It seems the average for respondents younger than 30 drives the main results while older respondents tend more towards insignificant and negative effects. Especially when excluding individuals between 15 and 20 consisting of part-time jobs and unusually early full-time labor force entrants in column (6)-(7) this seems to be the case.

Robustness checks

Appendix table (A6) shows control years before birth. These results should not yield any similar significant results as after birth. That would mean being alive while exposed to the shock have no different result then being unborn which would indicate lack of causality. There are however no such effects and the insignificant effects before birth have a slightly negative average for all columns (1, 2, and 3). Looking at effects while in utero in Table (A6) Column (4-6) no effects of significance can be seen and depending on trimester they vary in being slightly positive (second trimester) and slightly negative (first and third trimester).

Results regarding if amount of time worked last year change can be found in appendix table (A7). The effects are not as prominent as the wage with positive significant interval effect on weeks worked only for two, three and four years yet a significant effect in weeks worked can be found. The relatively weaker results may be to the variable division of weeks into intervals creating less variation in the variable compared to wage.

The migration analysis can be found in appendix table (A8) and seem to indicate insignificant results for migrants biasing the results downwards. Individuals who stayed in their state on the other hand have a positive effect of 0.00263 log points. The same insignificant number for migrants is 0.000206 and therefore about a tenth as large average which is substantially lower than the average deviations for most subgroups in the analysis.

Table 3 presents results regarding if the wage difference is driven through any of the main specification covariates determined after birth like SEI, education and employment status. The results indicate no significance at any level and therefore the wage effect is not directly driven by effects to any of these covariates or at least not to a significant degree.

Discussion

Results should be analyzed cautiously due to most regressions including 77 percent of the whole sample. Missing values cannot be expected to have a zero conditional mean and would therefore bias results if reported, how this would affect the results is nearly impossible to predict and therefore all inference here forth is done disregarding the missing values. A lack of effect before birth with a distinct shift to positive effects after birth indicate the presence of an actual effect. This effect seems to be prominent between two years after birth up until five years after birth and then successively disappear.

Generally, the positive effects might at a first glance seem surprising given this previous literature but looking at the age distribution one can see these effects are prominent only in early adulthood up until the age of thirty. In order to investigate the longer run effects on wage more data points would be needed for individuals aged 40 and older. The effects are relatively small and seem to need a large quantity of observations to be spotted with significance. It is therefore difficult from the results to pinpoint if the long-term effect of the volatility is of benefit or disadvantage for individuals wage without more data on later life wage.

Table 1 Wage effects from changes in unemployment during early childhood

VARIABLES	(1) Until 5	(2) Until 5	(3) Until 5	(4) Until 5	(5) Until 5	(6) Until 1	(7) Until 2	(8) Until 3	(9) Until 4
Change until five	0.0150**	0.0127**	0.0127**	0.00183*	0.00183*				
	(0.00741)	(0.00532)	(0.00532)	(0.00101)	(0.00101)				
Change until one						0.00154			
						(0.00149)			
Change until two							0.00219**		
							(0.00106)		
Change until three								0.00201**	
								(0.000959)	
Change until four									0.00176*
									(0.000891)
Duncan socioeconomic index		0.00736***	0.00736***	0.00635***	0.00635***	0.00635***	0.00635***	0.00635***	0.00635***
		(9.56e-05)	(9.56e-05)	(8.19e-05)	(8.18e-05)	(8.18e-05)	(8.18e-05)	(8.18e-05)	(8.18e-05)
Sex		-0.376***	-0.376***	-0.359***	-0.359***	-0.359***	-0.359***	-0.359***	-0.359***
		(0.0112)	(0.0112)	(0.0115)	(0.0115)	(0.0115)	(0.0115)	(0.0115)	(0.0115)
Educational attainment [general version]		0.126***	0.126***	0.111***	0.111***	0.111***	0.111***	0.111***	0.111***
		(0.00231)	(0.00231)	(0.00209)	(0.00209)	(0.00209)	(0.00209)	(0.00209)	(0.00209)
Race [general version]		-0.0133***	-0.0133***	-0.0109***	-0.0110***	-0.0110***	-0.0110***	-0.0110***	-0.0110***
		(0.00163)	(0.00164)	(0.00171)	(0.00172)	(0.00172)	(0.00172)	(0.00172)	(0.00172)
Employment status [general version]		-0.988***	-0.988***	-0.945***	-0.945***	-0.945***	-0.945***	-0.945***	-0.945***
		(0.00777)	(0.00777)	(0.00688)	(0.00688)	(0.00687)	(0.00687)	(0.00687)	(0.00687)
Constant	9.833***	10.31***	10.31***	10.74***	10.75***	10.75***	10.75***	10.75***	10.75***
	(0.0202)	(0.0197)	(0.0206)	(0.0192)	(0.0200)	(0.0179)	(0.0180)	(0.0187)	(0.0190)
Observations	4,344,201	4,015,611	4,015,611	4,015,611	4,015,611	4,015,611	4,015,611	4,015,611	4,015,611
R-squared			0.309		0.349	0.349	0.349	0.349	0.349
Number of current states	51	51	51	51	51	51	51	51	51
State FE	NO	NO	YES	NO	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	YES	YES	YES	YES	YES	YES
Controls	NO	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Notes: Moving from a biased simple regression towards in column (1) towards preferred specification with all controls and fixed effects in column (4) changes in unemployment level between birth and the age of five. Column (5)-(8) shows the persistence of the trend for years from birth up until five to solidify this significance not being due to random variation.

Table 2 Age distribution of wage effect due to changes in unemployment until five years old

VARIABLES	(1) 15-19	(2) 20-25	(3) 26-30	(4) 31-35	(5) 36-41	(6) 20-30	(7) 31-41
Change until five	-0.00126	0.00368	0.00131	-0.000949	0.000398	0.00269*	-0.000725
	(0.00626)	(0.00227)	(0.000794)	(0.00142)	(0.00169)	(0.00136)	(0.00118)
Duncan socioeconomic index	-0.0186***	0.00561***	0.00803***	0.00929***	0.0103***	0.00713***	0.00955***
	(0.000341)	(0.000140)	(0.000127)	(0.000143)	(0.000146)	(0.000120)	(0.000136)
Employment status [general version]	-0.984***	-0.634***	-0.724***	-0.819***	-0.867***	-0.680***	-0.829***
	(0.0152)	(0.00399)	(0.00669)	(0.00787)	(0.0116)	(0.00391)	(0.00814)
Educational attainment [general version]	-0.0893***	0.0318***	0.0941***	0.107***	0.106***	0.0765***	0.107***
	(0.00772)	(0.00247)	(0.00192)	(0.00192)	(0.00200)	(0.00204)	(0.00187)
Age	-0.324***	0.185***	0.0572***	0.0436***	0.0439***	0.116***	0.0424***
	(0.00786)	(0.00407)	(0.00156)	(0.00114)	(0.00168)	(0.00209)	(0.00111)
Sex	-0.0145***	-0.262***	-0.352***	-0.448***	-0.515***	-0.316***	-0.464***
	(0.00539)	(0.0107)	(0.0131)	(0.0135)	(0.0127)	(0.0118)	(0.0132)
Race [general version]	0.00866***	-0.0138***	-0.0145***	-0.0125***	-0.0120***	-0.0137***	-0.0124***
	(0.00207)	(0.00238)	(0.00233)	(0.00225)	(0.00169)	(0.00229)	(0.00196)
Constant	17.06***	5.863***	8.719***	9.158***	9.199***	7.071***	9.203***
	(0.164)	(0.107)	(0.0634)	(0.0545)	(0.0720)	(0.0750)	(0.0598)
Observations	338,714	1,188,090	1,374,207	841,790	272,810	2,562,297	1,114,600
R-squared	0.494	0.273	0.280	0.323	0.328	0.346	0.328
Number of current states	51	51	51	51	51	51	51

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is trimmed according to description of dependent variable,
all other observations are dropped for each regression hence different numbers of observations.

Table 3 Changes in unemployment during early childhood effects on employment, education and socioeconomic index

VARIABLES	(1) Employment until 5	(2) Employment until 10	(3) Employment 5 years before	(4) Education until 5	(5) Education until 10	(6) Education 5 years before	(7) Sei until 5	(8) Sei until 10	(9) Sei 5 years before
Change until five	-0.000812			0.00172			0.0102		
	(0.000643)			(0.00427)			(0.0372)		
Change until ten		0.000313			0.000310			-0.00771	
		(0.00104)			(0.0117)			(0.0979)	
Change five year before birth			0.00132			-0.000477			0.0343
			(0.00141)			(0.00710)			(0.0659)
Sex	0.0665***	0.0951***	0.0665***	0.486***	0.522***	0.467***	6.577***	6.519***	6.939***
	(0.00880)	(0.00901)	(0.00880)	(0.0123)	(0.0141)	(0.0112)	(0.137)	(0.154)	(0.135)
Race [general version]	0.0219***	0.0216***	0.0219***	-0.0813***	-0.0928***	-0.0726***	-0.69***	-0.758***	-0.617***
	(0.00389)	(0.00438)	(0.00389)	(0.00833)	(0.00900)	(0.00846)	(0.0931)	(0.115)	(0.0825)
Constant	1.279***	1.232***	1.274***	7.131***	7.099***	7.095***	34.39***	34.62***	32.72***
	(0.0148)	(0.0159)	(0.0139)	(0.0227)	(0.0217)	(0.0205)	(0.228)	(0.240)	(0.243)
Observations	5,492,004	4,027,142	5,492,004	5,492,004	4,027,142	3,863,699	5,086,244	3,724,140	3,579,709
R-squared	0.019	0.008	0.019	0.068	0.026	0.069	0.064	0.027	0.063
Number of current states	51	51	51	51	51	51	51	51	51
State FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	Pre-determined	Pre-determined	Pre-determined	Pre-determined	Pre-determined	Pre-determined	Pre-determined	Pre-determined	Pre-determined

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

There are two main theoretical possibilities of how the shock translates to a higher wage. The first is through a change in labor consumption behavior as individuals work more weeks and not change in other characteristics like education, socio-economic status, and employment status. As the increase is both positive for wage and for hours worked indicate a dominating substitution effect and therefore a transition in the labor choice beneath the turning point in figure (1). The results considering life-time consumption smoothing is in accordance with the theories of shock sensitivity put forth by Flavin (1993) as both Friedman's (1957) and Modigliani's (1954) original life-time consumption theories predicts no effect. That means, according to Flavin (1993) the household not being able to efficiently access or afford the financial market. Considering the results this is the case for such a long time that the child must work more twenty years later when entering the labor market to obtain a preferred lifetime consumption level their parents could not provide. The reason for this effects prevalence until five (or ten for some groups) could be because of a relatively more strained family economy in early childhood compared to later childhood following the childhood expenses results of Edwards (1981). The shock would then force especially early childhood families to change their consumption behavior to a larger extent. This difference in economical prerequisites to deal with economic volatility could explain why effects from economic shocks seems to fade out the further from birth the unemployment change is.

The other possibility is the effect runs through affecting characteristics determining working ability and thereby wage. The results indicate economic shocks during early childhood having a positive effect on wage. If moving through the health of the individual not measured here this would be in line with previous research of early childhood shocks having long lasting effects (Case et al., 2005; Van den Berg et al., 2006; Almond, 2006). In that case the results are furthermore in line with the theory of life course epidemiology models b, c or d and in conflict with the underlying structure of the Grossman model. As previous research like Adhvaryu et al. (2019) have found health effects from economic childhood shocks individuals could experience better health from these shocks and therefore be off work sick for less weeks. This would on the other hand contradict the same Adhvaryu et al. (2019) research in the sense that shocks in this study seems to be good for long-term health if effects go through a change in health characteristics.

Regarding the social characteristics included there is no statistically apparent effect from early childhood economic shocks on either employment status, socio-economic index or education the wage rate. These effects could of course run through any other characteristics

channel not included in this study. One theoretical danger would be if individuals are not affected at all which is implied by all models mentioned and instead the effect runs though affecting the state composition breaking the exogeneity assumption. Looking at migration results one can clearly see migrants between states is not driving results as effects are smaller among migrants. Any potential effect on wage from the shocks going through the state would be mitigated by the state fixed effect estimator so it seems more reasonable migration differences are driven by some sort of difference in characteristics.

The heterogeneity concerning ethnics and sex indicate effects being stronger for men and non-whites. This seems to be in line with Gardner (1994) claims regarding the recessions during the time affecting primarily black and Hispanic communities. Further at the time male dominated professions like construction and mining saw downturn in job growth during the period and therefore it would be reasonable with large effects for these groups. These groups and among them especially blacks have generally higher significance in results and effects stretch longer in time up until the age of ten years old.

Recommendation going forward would be encouraging research of the same issue with more observations of individuals currently around their forties and fifties to better understand the early economic shock effects of wage during the peak of life-time wage curve. Another topic for exploration would be looking more closely at why the number of weeks worked and subsequent wage change, if it is due to a conscious choice or change in working ability like weeks of sick. Further policy evaluation regarding redistribution to families giving birth prior to economic volatility would also likely be fruitful as the children born seems to change labor behavior much later in life. If the effect goes through affecting characteristics investments around the time might be fruitful for better working ability. If the effect goes through the choice if labor this could allow both the parents and their children to better smooth consumption over the lifecycle. The results could as well be driven by a combination of the two and then further research and policy evaluation might improve both.

Conclusion

In this study positive effects on wage for adults up to thirty are found due to economic shocks during childhood. The average effect for survey respondents is a wage increase of 0.00183 log points per percentage point change in unemployment. Taking the average wage as example for an average lifetime wage indicate a five-percentage point shock to the unemployment level amounting to a $10 725 positive wage effect. Effects are stronger for men and non-whites while insignificant for whites in general and females. Migration between state of birth and state of residence have non-significant effects while stayers have significant effects. Average estimates for non-significant groups are in the same region as baseline results. The effects seem to be driven through a change in labor consumption.

The study adds to the literature on early life shocks in exploring economic shocks effect on future economic outcomes. While this study takes a first step into how early life economic shocks affects later life economy more research seems to be needed about specific characteristics for affected families within the groups studied in this study. Further taking the issue to a data set with more individuals around their mid-forties along with unemployment levels for the same might shed more light on the long-lasting effects on wage. Finally, research may also look more extensively into exactly why labor consumption behavior change. If it is due to labor choice or improved ability to work more weeks. Policy evaluation regarding redistribution to families giving birth in and around economic volatility seems fruitful as children's labor market outcomes clearly change.

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Appendix

Codebook A1 A sei sex educ race empstat birthyr current_state birthstate

sei duncan socioeconomic index

---

type: numeric (byte)

range: [0,96] units: 1
unique values: 81 missing .: 410,128/5,496,372

mean: 37.6871
std. dev: 25.8916

percentiles: 10% 25% 50% 75% 90%
0 15 44 62 72

---

sex sex

---

type: numeric (byte)
label: SEX

range: [1,2] units: 1
unique values: 2 missing .: 4,368/5,496,372

tabulation: Freq. Numeric Label
2,753,918 1 1. male
2,738,086 2 2. female
4,368 .

---

educ educational attainment [general version]

---

type: numeric (byte)
label: EDUC

range: [0,11] units: 1
unique values: 11 missing .: 4,368/5,496,372

examples: 6 6. grade 12
6 6. grade 12
7 7. 1 year of college
10 10. 4 years of college

---

race race [general version]

---

type: numeric (byte)
label: RACE

range: [1,9] units: 1
unique values: 9 missing .: 4,368/5,496,372

tabulation: Freq.	Numeric	Label
4,277,383	1	1. white
678,896	2	2. black/african american/negro
67,730	3	3. american indian or alaska native
29,939	4	4. chinese
6,899	5	5. japanese
94,925	6	6. other asian or pacific islander
183,953	7	7. other race, nec
136,327	8	8. two major races
15,952	9	9. three or more major races
4,368	.	

---

empstat employment status [general version]

---

type: numeric (byte)
label: EMPSTAT

range: [0,3] units: 1
unique values: 4 missing .: 4,368/5,496,372

tabulation: Freq.	Numeric	Label
38,331	0	0. n/a
3,857,386	1	1. employed
388,914	2	2. unemployed
1,207,373	3	3. not in labor force
4,368	.	

```
-------------------------------------------------------------------------------
birthyr                                                      year of birth
-------------------------------------------------------------------------------

            type:  numeric (int)

           range:  [1977,1990]                 units:  1
     unique values:  14                        missing .:  4,368/5,496,372

            mean:   1983.98
       std. dev:    3.9361

      percentiles:       10%       25%       50%       75%       90%
                        1978      1981      1984      1987      1989


-------------------------------------------------------------------------------
current_state                                                Current state
-------------------------------------------------------------------------------

            type:  numeric (float)
           label:  STATEFIP, but 5 nonmissing values are not labeled

           range:  [1,56]                      units:  1
     unique values:  56                        missing .:  0/5,496,372

        examples:  12    12. florida
                   21    21. kentucky
                   35    35. new mexico
                   42    42. pennsylvania

-------------------------------------------------------------------------------
birthstate                                   birthplace [general version]
-------------------------------------------------------------------------------

            type:  numeric (long)
           label:  BPL, but 5 nonmissing values are not labeled

           range:  [1,52]                      units:  1
     unique values:  52                        missing .:  0/5,496,372

        examples:  10    10. delaware
                   21    21. kentucky
                   34    34. new jersey
                   42    42. Pennsylvania
```

---

wkswork2 weeks worked last year, intervalled

---

type: numeric (byte)
label: WKSWORK2

range: [0,6] units: 1
unique values: 7 missing .: 4,368/5,496,372

tabulation: Freq.	Numeric	Label
1,041,510	0	0. n/a
393,137	1	1. 1-13 weeks
304,581	2	2. 14-26 weeks
314,941	3	3. 27-39 weeks
309,458	4	4. 40-47 weeks
121,745	5	5. 48-49 weeks
3,006,632	6	6. 50-52 weeks
4,368	.	

A2 Statistics table

VARIABLES	(1) Whole sample (SD)	(2) -8 to -4 (SD)	(3) -4 to 0 (SD)	(4) 0 to 4 (SD)	(5) 4 to 8 (SD)	(6) 8 to 13 (SD)
Log wage	9.797	10.01	9.736	9.794	10.12	10.37
	(1.356)	(1.129)	(1.379)	(1.386)	(1.207)	(1.099)
Change until five	-0.324	-4.996	-1.391	1.227	4.910	8.675
	(2.576)	(1.113)	(1.195)	(1.279)	(1.110)	(1.341)
Weeks worked last year, intervalled	4.824	5.116	4.748	4.813	5.155	5.323
	(1.820)	(1.582)	(1.868)	(1.829)	(1.575)	(1.404)
Duncan socioeconomic index	43.03	45.62	42.18	43.04	46.28	49.96
	(23.78)	(23.71)	(23.75)	(23.81)	(23.86)	(23.48)
Sex	1.490	1.488	1.491	1.490	1.489	1.477
	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.499)
Educational attainment [general version]	7.543	7.874	7.472	7.516	7.830	8.184
	(2.112)	(2.091)	(2.105)	(2.122)	(2.144)	(2.143)
Race [general version]	1.614	1.517	1.652	1.593	1.466	1.477
	(1.660)	(1.541)	(1.708)	(1.628)	(1.403)	(1.427)
Employment status [general version]	1.209	1.170	1.216	1.213	1.157	1.123
	(0.590)	(0.514)	(0.606)	(0.595)	(0.506)	(0.444)
Year of birth	1,984	1,983	1,985	1,983	1,980	1,977
	(3.892)	(1.170)	(3.270)	(4.447)	(3.803)	(0.564)
Observations	4,015,611	353,534	2,445,982	1,800,796	292,564	26,802
Number of current states	51	51	51	51	51	51

Notes: The sample is divided into five groups depending on how unemployment fluctuated for individuals in the first five years of life to give and overview of different segments of the sample depending on exogenous variable of interest.

Table A3 Lack of wage effects after five years of age

VARIABLES	(1) Until 6	(2) Until 7	(3) Until 8	(4) Until 9	(5) Until 10	(6) 5 to 10
Change until six	0.00183					
	(0.00120)					
Change until seven		0.00189				
		(0.00134)				
Change until eight			0.00213			
			(0.00153)			
Change until nine				0.00218		
				(0.00170)		
Change until ten					0.00209	
					(0.00166)	
Change five to ten						0.000518
						(0.00142)
Observations	4,015,611	3,936,767	3,621,936	3,319,611	3,013,761	3,013,761
R-squared	0.349	0.353	0.371	0.352	0.333	0.333
Number of current states	51	51	51	51	51	51
State FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A4 Wage effects of changes in unemployment during early childhood by sex

VARIABLES	(1) Male until 5	(2) Male Until 10	(3) Male 5 to 10	(4) Female until 5	(5) Female until 10	(6) Female 5 to 10
Change until five	0.00206**			0.00158		
	(0.00102)			(0.00121)		
Change until ten		0.00213			0.00197	
		(0.00175)			(0.00174)	
Change five to ten			-3.79e-06			0.000976
			(0.00172)			(0.00129)
Constant	10.65***	10.35***	10.35***	9.737***	9.355***	9.359***
	(0.0195)	(0.0235)	(0.0199)	(0.0241)	(0.0175)	(0.0186)
Observations	2,046,832	1,537,776	1,537,776	1,968,779	1,475,985	1,475,985
R-squared	0.351	0.323	0.323	0.338	0.330	0.330
Number of current states	51	51	51	51	51	51
State FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: All observations are kept if sex is one (man) is kept in column (1)-(3) and equally for sex equal two (women) in column (4)-(6).

Table A5 Wage effects of changes in unemployment during early childhood by ethnicity

VARIABLES	(1) White until 5	(2) White until 10	(3) White 5 to 10	(4) Black until 5	(5) Black until 10	(6) Black 5 to 10	(7) Other until 5	(8) Other until 10	(9) Other 5 to 10
Change until five	0.00129			0.00449***			0.00189*		
	(0.00101)			(0.00139)			(0.00101)		
Change until ten		0.00149			0.00481**			0.00224	
		(0.00159)			(0.00204)			(0.00165)	
Change five to ten			0.000402			0.00179			0.000681
			(0.00128)			(0.00220)			(0.00145)
Constant	10.78***	10.55***	10.55***	10.38***	9.911***	9.918***	10.73***	10.46***	10.46***
	(0.0205)	(0.0242)	(0.0216)	(0.0273)	(0.0274)	(0.0272)	(0.0191)	(0.0247)	(0.0218)
Observations	3,210,552	2,423,548	2,423,548	434,763	323,732	323,732	4,015,611	3,013,761	3,013,761
R-squared	0.357	0.335	0.335	0.286	0.285	0.285	0.348	0.333	0.333
Number of current state	51	51	51	51	51	51	51	51	51
State FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: All observations are kept if race is one (White) is kept in column (1)-(3), if race is two (4)-(6) and other ethnicity (7)-(9). Further note that others are a merged group from the remaining seven categories. This is done to limit the table space as these seven categories constitute less than 10 percent of the sample

Table A6 Lack of salary effects before birth

VARIABLES	(1) Five years before	(2) Two years before	(3) One year before	(4) First tri	(5) Second tri	(6) Third tri
Change five year before birth	-0.000239					
	(0.00237)					
Change two year before birth		-0.000333				
		(0.00234)				
Change one year before birth			-9.63e-05			
			(0.00210)			
Change in trimester one				-0.00191		
				(0.00376)		
Change in trimester two					0.000510	
					(0.00214)	
Change in trimester three						-0.000510
						(0.00214)
Constant	10.63***	10.73***	10.75***	10.75***	10.75***	10.75***
	(0.0210)	(0.0170)	(0.0180)	(0.0180)	(0.0180)	(0.0180)
Observations	2,801,589	3,668,186	3,943,601	4,015,611	4,015,611	4,015,611
R-squared	0.323	0.342	0.347	0.349	0.349	0.349
Number of current state	51	51	51	51	51	51
State FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A7 Effects on weeks worked from changes in unemployment during early childhood

VARIABLES	(1) Until 1	(2) Until 2	(3) Until 3	(4) Until 4	(5) Until 5
Change until one year old	-0.00217				
	(0.0105)				
Change until two years old		0.00489**			
		(0.00226)			
Change until three years old			0.00441**		
			(0.00184)		
Change until four years old				0.00336*	
				(0.00190)	
Change until five years old					0.00283
					(0.00209)
Sex	-0.263***	-0.275***	-0.275***	-0.275***	-0.275***
	(0.0282)	(0.0281)	(0.0281)	(0.0281)	(0.0281)
Race [general version]	-0.0835***	-0.0710***	-0.0710***	-0.0710***	-0.0710***
	(0.0131)	(0.0128)	(0.0128)	(0.0128)	(0.0128)
Constant	4.508***	4.992***	4.986***	4.984***	4.980***
	(0.0502)	(0.0466)	(0.0482)	(0.0492)	(0.0513)
Observations	5,492,004	5,492,004	5,492,004	5,492,004	5,492,004
R-squared	0.006	0.052	0.052	0.052	0.052
Number of current state	51	51	51	51	51
State FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Controls	Pre-determined	Pre-determined	Pre-determined	Pre-determined	Pre-determined

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Change in weeks worked last year in column (1). Column (2)-(5) shows the persistence of the trend with and without clustered standard errors up until five to solidify this significance not being due to random variation.

Table A8 Wage effects of changes in unemployment during first five years by migration status

VARIABLES	(1) Migrants	(2) Stayers
Change until five	0.000206	0.00263**
	(0.000648)	(0.00124)
Observations	1,270,624	2,744,987
R-squared	0.359	0.340
Number of current state	51	47
State FE	YES	YES
Year FE	YES	YES
Controls	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: All observations where the variable for current state is equal to birth state variable is kept dropped in column (1) and kept in column (2).