CENTRE FOR ECONOMIC HISTORY
THE AUSTRALIAN NATIONAL UNIVERSITY
DISCUSSION PAPER SERIES

RELIEF DURING THE GREAT DEPRESSION IN AUSTRALIA AND AMERICA:
NOEL G. BUTLIN LECTURE FOR THE AUSTRALIAN ECONOMIC HISTORY
REVIEW

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DISCUSSION PAPER NO. 2012-5

JULY 2012

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Relief During the Great Depression in Australia and America

Noel G. Butlin Lecture
For the
Australian Economic History Review

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The written version of the Butlin lecture provides substantially more information on Australia than the public lecture given at the Asia Pacific Economic and Business History meetings in Canberra, Australia, February 20, 2012. I would like to offer special thanks to Tim Hatton for inviting me to Australia to visit the Australian National University and to attend the APEBH meetings. I thank the the ANU and the Asia Pacific Economic and Business History Association for providing funding for my trip. In developing the public lecture and this written version, I benefitted greatly from discussions with Alison Booth, Pierre Van der Eng, Bob Gregory, Tim Hatton, Trevor Kollmann, Martine Mariotti, Warwick McKibbin, Stephen Morgan, Les Oxley, Martin Shanahan, and John Wang. The research on the New Deal received the support of the University of Arizona and U.S. National Science Foundation grants SES- 0921732, SES-0617972, SES-0214483, SES-0080324, and SBR-9708098. All opinions expressed are my own and should not be seen as representing the views of the National Science Foundation. Any errors are my own.

Relief During the Great Depression in Australia and America

Price V. Fishback

I compare and contrast the relief efforts in response to the extraordinary employment of the Great Depression in the U.S. and Australia. The effectiveness of relief spending in America at the local level is discussed with reference to a series of studies that I have performed with a series of co-authors. To compare the U.S. demographic results with the impact of relief spending in Australia, I develop a panel data set for the Australian states from 1929 through 1939 and then estimate the relationship between relief spending by the states and various demographic measures, including infant mortality, the death rate, the crude birth rate, marriage rates, and the divorce rate.

The Great Depression hit both Australia and the United States hard. Real Gross Domestic Product experienced drastic drops. Unemployment rates rose well above ten percent to levels that are multiples of rates seen since. Australia began recovering one to two years earlier and the situation never reached the depths experienced in America. Both countries began their turnarounds after explicitly or implicitly eliminating their ties to the gold standard. Neither appears to have followed a full-scale Keynesian policy to combat the Depression by increasing national government deficits by amounts anywhere near the size of the problem.

The various governments in both countries embarked on large-scale efforts to aid the unemployed and the poor during the Depression using work relief projects. The economy in Australia turned around earlier than in America and the Commonwealth government in Australia never provide more than a small share of funding. In contrast, the federal government in America financed a large segment of the relief effort after 1932. My goal in this paper is to compare and contrast the relief efforts in the U.S. and Australia during the 1930s, discuss the effectiveness of relief spending in America based on a series of studies in which I participated, and then provide some new results for the impact of relief spending on various demographic measures in the Australian States between 1929 and 1939.

It has been an honor to have the opportunity to give the Butlin Lecture. Noel Butlin was a great economic historian who compiled and constructed a large share of the data that are used to describe the history of the Australian economy. In a sign of true genius, he even produced sons who have carried on the tradition. Professor Butlin and Robert Gregory also edited a comprehensive volume on the *Recovery from the Depression* in Australia and the rest of the world. In preparing the lecture and writing the paper, I have learned an enormous amount from his writings and the statistics that he developed.

The Size of the Problem

The Depression in the U.S. was much deeper and lasted longer than in Australia. The index of U.S. Real GDP in Figure 1 dropped by almost 30 percent between 1929 and 1932, stayed 30 percent below in 1933, and then finally reached the 1929 level again in 1937. The Australian decline was much smaller, whether measured by Bryan Haig (2001) or Noel Butlin (1962). Butlin's estimates suggest that the decline did not start until 1931, real GDP fell to nearly 10 percent below the 1931 level in 1931 and 1932 and then returned near the 1930 level again in 1933. Haig's Australian estimates declined by 20 percent from the 1929 peak, followed by a long recovery with GDP reaching the 1929 level again in 1935.¹

Figure 2 shows two estimates each for unemployment as a share of the labor force in Australia and the U.S. Comparisons of the higher rates in each country show that Australian unemployment rose to a point roughly 3 percentage points higher than the U.S. in 1930 and 1931. Then U.S. unemployment jumped dramatically higher in 1932 and the U.S. unemployment rate stayed several percentage points higher than the Australian rate from 1933 through 1937. The gap then widened to over 10 percent before declining to roughly 8.4 percent in 1939.

The figure shows two U.S. unemployment rates, one including federal emergency relief workers and one without them. Michael Darby (1976) raised the question of whether federal emergency relief workers should be treated as unemployed. Work relief was designed as a

¹According to Hutchinson (2012) most people agree on the nominal estimates of Australian GDP for the 1920s and 1930s. Noel Butlin estimated a GDP deflator but was dissatisfied with it. Mathew Butlin developed a second set of estimates of the deflator, but he too was dissatisfied. Bryan Haig (2001) developed an alternative estimate of real GDP by constructing it from the ground up with a fixed set of 1938-1939 prices for goods.

program to provide funds to families to raise their earnings high enough to meet minimum spending standards. As a result, relief workers for the Federal Emergency Relief Administration (FERA) from 1933 through 1935 and the Works Progress Administration (WPA) from 1935 through 1942 received hourly wages that were roughly half of the hourly wages paid to men working on federal public works and public roads projects that operated under normal federal procedures. Further, relief workers faced constraints on the number of hours they could work per month. Essentially, relief work paid wages that were roughly as generous as a share of regular wages as modern unemployment benefits while adding a work requirement. My own view is that they should be treated as unemployed to be comparable with modern unemployment figures.

The Australian unemployment rates listed in Figure 2 were developed by Keating (1973) who developed two estimates based on Census information from 1929, 1933, and 1939 while using trade union unemployment figures to interpolate in between. The higher estimates include adjustments Keating made while arguing that the trade union figures understated union unemployment in some years. Forster (1988, 291, 296) suggests that the treatment of Australian relief workers was inconsistent in the Census benchmarks. In 1939 the Australian figures include relief workers among the unemployed in 1939 because the Census asked relief workers to describe themselves as unemployed. The Census of 1933 had no such statement and the Census Statistician thought that a number of people who had reported themselves to be working part-time on sustenance or relief work should have been added to the unemployed. Information from Forster (p. 296) suggests that the Australian unemployment rate should be about 0.9 percentage points higher in 1933 than the one in Figure 2.² In the interpolation of unemployment

²When making this point, Forster (1988, 296) stated that unemployment as a share of wage and salary workers in 1933 should have been higher by 1.3 percentage points, while the rates here are reported as a share of the labor

between the Census benchmarks, the difference between the true rate and the rate in Figure 2 would have then diminished and become zero in 1939. Even after this adjustment, however, the unemployment rates in the U.S. from 1932 through 1939 were substantially higher than in Australia.

Macroeconomic Policy Responses

Both countries began recovering soon after they moved away from strong compliance with the Gold Standard. Australia still was officially on the Gold Standard but a currency devaluation during 1930 was so strong that essentially Australia was among the first to leave the gold standard, albeit unofficially. In contrast, U.S. monetary policy seemed to focus on maintaining the dollar's value under the Gold Standard until finally leaving the Gold Standard soon after Roosevelt left office in 1933. The difference in policies appears to have been a contributing factor to Australia's earlier recovery (Eichengreen 1988, 34; Eichengreen 1992)

Neither the Australians nor the Americans ran budget deficits that would have been considered Keynesian in the 1930s. The discussion of the fiscal policy responses to the Great Depression in America have focused on the public statements of Hoover and Roosevelt. However, the spending, receipt, and deficit numbers reveal a more subtle story. Hoover was a fiscal conservative and called for policies to balance the federal budget, but federal spending rapidly expanded during his administration. The estimates of federal spending in Figure 3 show

force. In 1933 unemployment as a share of the workforce was 18.9, while unemployment as a share of wage and salary workers was 24.4. This suggests that wage and salary workers accounted for 77.5 percent of the labor force; therefore, I multiplied Forster's 1.3 percent figure by .775 to determine how much unemployment as a share of the labor force would have increased when adding relief workers. Since the 1939 figure included relief workers as unemployed, in the interpolation process, the difference in unemployment due to relief workers would have diminished so that it hit zero in 1939. Forster offered an alternative unemployment rate that incorporated estimates of workers who never entered the workforce and the losses of working time from part-time work caused by the Depression as well as the additional relief workers, but there are no comparable estimates for the U.S.

that federal spending between fiscal years 1930 and 1932 deviated from the path of spending that prior Republican administrations had followed in the 1920s. Real federal government spending grew hardly at all between 1922 and 1930 and then rose 88 percent between 1929 and 1932, with most of the rise occurring in fiscal 1932.³ This effort receives less attention than the increases in federal spending under the Roosevelt administration because the Hoover administration did it in the context of existing programs, like highway spending under the Department of Agriculture . The highway reports discuss goals of providing employment stimulus by pushing highway projects forward in time and adding new projects. Hoover then became infamous as a budget balancer because while the economy continued to deteriorate, he did not expand federal spending in real terms any further in fiscal 1933 and pushed strongly for income and excise tax increases in June of 1932 to try to offset the sharp decline in federal receipts seen in Figure 2 between 1930 and 1932.

Roosevelt campaigned for a balanced budget in the 1932 election. The deficit figures in Figure 2 show that his administration and the Democratic Congress generally ran deficits in real dollar terms that were only slightly larger than the ones run by Hoover. Starting from a higher base, they raised spending by 68 percent from 1933 to 1936, while tax receipts kept pace, leaving the deficits relatively unchanged.

A crude way to see the lack of a Keynesian response is to show the deficits relative to the decline in Real GDP in both countries. In Australia in 1938-1939 pounds Real GDP in Figure 4b in both 1931 and 1932 was more than \$110 million pounds lower than in 1929 but the deficits were no larger than 18 million. In the U.S. in 1939 dollars, the U.S. Real GNP in Figure 4a in

³ The fiscal year for 1933 ran from July 1, 1932 to July 1, 1933 so the spending policies for 1933 were largely determined by the Hoover administration because Roosevelt did not become President until early March of 1933. Nominal spending rose roughly 56 percent during the period while price deflation raised the rate to 88 percent.

1932 and 1933 fell short of peak real GDP in 1929 by more than \$20 billion but the deficits were less than \$4 billion.⁴

The Relief of Unemployment.

Both countries followed their long run traditions of relying on state and local governments to deal with relief of poverty and unemployment through 1932. From that point the countries parted ways. In Australia the unemployment rate began falling and real GDP began rising (Figures 1 and 3) and Australia continued to rely largely on state and local provision of relief. In America the unemployment rate rose further and the federal government treated the Depression as a national emergency that required large federal contributions to the relief of poverty and unemployment.

Australian Relief

Throughout the 1930s Australia's state and local governments maintained the vast majority of responsibility for relief. Australian governments spent 116.3 million pounds on unemployment relief from revenue funds and 49 million from loan funds between 1929 and 1939. Of that total the central government provided the states with 7.1 million pounds, or only 4.3 percent (Snooks 1988, 313, 316).

Australian real public unemployment relief distributions as a share of peak real GDP in 1939 contemporary GDP in Table 1 rose from 0.5 percent to 1.9 percent during 1932 when the unemployment rate peaked. Even as the unemployment rate declined, unemployment relief as a

⁴ For in depth analysis of the extent of Keynesian activity in the U.S., see Brown (1952) and Peppers (1973) and the survey by Fishback (2010). For Australia see Pincus (1988).

share of peak real GDP rose to 2.39 in 1935 before declining to 1.77 by the end of the decade. Graham Snooks (1988) suggests that the unemployment relief significantly crowded out other public works being built by the governments. Consistent with this view is the sharp decline of other public works spending by the Commonwealth and the states from 1 percent of 1929's peak GDP in 1929 to 0.32 percent or less between 1932 and 1934 in Table 1. Other public works spending still had not reached its prior 1929 level by the end of the decade.

In response to the high unemployment rates, the Australian state governments focused on providing work relief rather than direct sustenance. A rough estimate of the income replacement rate for relief is the ratio of relief per family receiving aid to average annual male earnings in manufacturing. The large number of families seeking relief drove relief payments per family down to only 6 percent of average annual male earnings in 1932. The ratio reached a higher level of around 33 to 35 percent in the mid 1930s as unemployment abated. The official rules called for a basic rate of pay for a single man working for sustenance that ranged from 16 percent of the male basic wage in Victoria and New South Wales to 23 percent in Queensland. Men with families received higher percentages that rose with the number of children (Murphy 2011, pp. 174-5).

American Relief

In contrast, in the United States after 1932 the federal government became heavily involved in the provision of relief and created a wide range of relief programs. The federal government's first significant move took place in 1932 while Hoover was still president. The Reconstruction Finance Corporation (RFC) authorized \$300 million dollars in loans from the federal government to cities to help them in providing relief. The sum amounted to about 0.4

percent of 1929 peak GDP in real terms. States that applied for relief loans had to demonstrate that they had exhausted all means of raising revenue and propose worthy relief projects that would not otherwise be undertaken. The RFC loans were a bold move historically because the U.S. federal system had long treated relief and labor issues as exclusively state and local issues. Originally, these loans were meant to be repaid at three percent interest through reductions in future highway apportionments, but the RFC was allowed to write them off in 1938.⁵ The RFC loans led several states to establish new relief administrations to organize relief at the state level.

During the New Deal the Roosevelt administrations experimented with a wide variety of federal programs that either provided grants to state and local governments or were run by the federal government itself. Arguing that America faced a national peacetime emergency, the national government created the Federal Emergency Relief Administration. The FERA distributed federal money to the states, which in turn, distributed the funds to local officials, who administered payments to households “in need.” Similar to the Australian practice, the FERA program offered payments for work relief. Unlike the Australian governments, however, the FERA also spent nearly the same amount again for direct relief, or sustenance without a work requirement. The relief payments to each household were determined using a “budgetary deficiency” principle. FERA relief workers and field agents measured the deficit between the family’s actual income and a hypothetical minimum budget for a given family size. Actual relief benefits often did not fully cover the family’s deficit because relief officials, faced with large case loads and limited funds, reduced benefits per household in order to provide relief for more families. Typically, hourly earnings were roughly half of the level paid for jobs on Public Roads Administration (PRA) and Public Works Administration (PWA) projects.

⁵ For discussion of the RFC relief loans see Jones (1951, 178) and Fearon (2007, 39-49).

Expecting a harsh winter in November 1933, the Civil Works Administration (CWA) was created in addition to the FERA to put people to work on public jobs immediately. The CWA employed nearly 4 million people by its second month at hourly earnings that matched PWA and PRA market earning but limited the number of hours per week that could be worked. About half of all CWA recipients had been moved from existing relief programs and most workers were transferred to FERA work relief programs when the CWA closed down in March 1934, most of the workers were transferred back to FERA work relief programs. Between July 1933 and July 1935, the FERA and the CWA annually distributed 3.5 percent of the 1929 peak in real GDP per capita (Fishback and Wallis, forthcoming, Table 2).

The Civilian Conservation Corps (CCCR) provided work relief for young men and some young women between the ages of 16 and 24 from families eligible for relief. Most worked on natural resource conservation projects while living in camps run in a semi-military fashion by veterans. The pay was \$1 per day, most of which was sent home to the workers' family. Between 1934 and 1939 the CCCR annually paid out about 0.4 percent of peak 1929 GDP per capita (Fishback and Wallis, forthcoming, Table 2).

In 1935 the Roosevelt administration and Congress negotiated a redesigned relief program that included an emergency relief component as well as a permanent national role in the welfare system (Wallis, Fishback, and Kantor 2006). The Roosevelt administration gained much tighter control of the operation of emergency work relief by replacing the FERA with the Works Progress Administration (WPA). State and local officials proposed projects and continued to identify who was eligible for relief based on household budget deficits. Then the federal WPA hired people from the certification rolls and paid them hourly earnings for a restricted number of hours per month. As with the FERA, hourly earnings were roughly half

those on PWA and PRA projects. To combat fears that private jobs would end quickly, the WPA assured people in many areas that they would be accepted back on work relief if they lost their private job. Even so, a significant percentage of workers stayed on work relief jobs for periods as long as a year and in some cases several years (Margo 1991). The FERA and WPA were temporary “emergency” programs that would end. Even though some members of the administration wished to make them a permanent feature of the economy, the WPA was phased out by the end of 1942.⁶ Between fiscal years 1936 and 1939, the WPA annually spent roughly 2 percent of 1929 per capita GDP (Fishback and Wallis, 2012, forthcoming).

The permanent components of the 1935 reforms were the most important. Care of the “unemployable” poor was returned to local governments and termed “general relief.” The Social Security Act created five major programs. Three were needs-based public assistance programs. Aid to the Blind, Old Age Assistance, and Aid to Dependent Children were financed with matching grants that required the states to pass enabling legislation to meet administrative requirements. States set the benefits per case and ran the program and the national government matched state spending up to a maximum amount per case. The matching grants generally increased the amount of aid available in the categories in states that already had programs and led states without programs to add them. Aid to Dependent Children (ADC) essentially took over from mothers’ pension programs that provided payments to widows with children and were present in 40 of 48 states in 1920 and 46 of 48 states by 1931. Old Age Assistance (OAA) replaced means-tested old-age programs that were present in 10 of 48 states by 1929 and 28 of 48 states in 1934. OAA and the earlier state elderly programs were truly means tested. Many

⁶Howard (1943) describes WPA operation. For a good description of relief activity within a state, see Fearon (2007) for the state of Kansas. A large number of statistical studies analyze the political economy of the distribution of the New Deal relief funds, including most recently Fleck (1999a, 1999b, 2001a, 2008), Wallis (1987, 1991, 1998, and 2001) and Fishback, Kantor, and Wallis (2003), which summarizes results for a large number of studies of all New Deal programs. See also Wright (1974).

states took liens on or ownership of the homes owned by recipients and then collected the amounts paid out in benefits when the person died before the heirs could receive their share of the home (Stoian and Fishback 2010; Balan-Cohen 2006). Aid to the Blind replaced similar programs in 28 of 48 states as of August 1935 (Fishback and Thomasson, 2006, p. 2-709). The Old Age Assistance programs distributed about 80 percent of the funds under the three public assistance programs, as a large number of elderly were transferred off of the general relief rolls and new elderly enrolled. In 1939 the states paid out about 0.65 percent of 1929 GDP in public assistance benefits.⁷

Another permanent element of the Social Security Act was national support for unemployment insurance. The national government collected a 3 percent payroll tax, of which 90 percent were paid into separate state reserve funds, on which states drew to benefits. To participate, states had to pass the enabling legislation and then build their reserve fund for two years. By the end of 1938, 30 of 48 states were paying benefits totaling 0.36 percent of 1929 peak GDP.

The final component of the Social Security Act was a purely national program, Old Age and Survivors Insurance (OASI). This is the program known commonly as Social Security today. At best it had a slight negative impact in the 1930s because the OASI program collected taxes of one percent on both employers and workers, which began accounting for 5.6 percent of internal federal tax revenue in 1937, but no benefits were paid out to the elderly until 1940 (Commissioner of Internal Revenue 1937, 75).

⁷Information on the public assistance programs is based on the payouts in the months of January, February of March from Social Security Board. *Social Security Bulletin* (May 1939): 51. These were compared to an estimate of GDP in 1929 dollars in 1929 of 103.7 billion (series Ca10 from Carter, et. al.) and then adjusted for inflation by the Consumer Price Index (1967=100) (series E-135, p. 210-11, U.S. Census Bureau, 1975).

During the 1930s the federal government also continued to provide relief to veterans of the military, a responsibility since the nation's founding. One big change came in the treatment of Adjusted-Service Certificates (ASCs) first provided to World War I veterans in 1924. The ASCs were like a pension scheme that were to pay out benefits to veterans in the 1940s based on payments of \$1.25 - \$1.50 per day of service during the First World War. By the late 1920s living veterans were allowed to borrow from the Veterans' Bureau against the certificates. They could pay back the loan and receive the full certificate value upon maturity of the certificate in the 1940s or not repay and accept the amount left after interest was deducted. After Congress increased the amount that could be borrowed and lowered the loan interest rate in 1931, World War I veterans took out 2 million loans valued at \$795 million within the next few months. Demanding that the full value of the certificates be paid without delay, groups of veterans marched on Washington in the summer of 1931 and again in the summer of 1932 when they set up camp near the Potomac. The bloodshed that occurred when the army tried to clear the camp harmed President Hoover's re-election bid. Yet, Hoover and the Republic Congress refused to redeem the certificates early on the grounds that it would lead to higher taxes.

Veterans continued to lobby for early payment on the certificates and Congress passed the Veterans' Bonus Bill over President Roosevelt's veto in January 1936. The Veterans Administration received 3.3 million applications seeking cash settlements of \$3.2 billion for settlement by June 30, 1936. The VA payout in summer of 1936 as a percentage of 1929 peak GDP per capita was 4.1 percent, with 2 percent going to pay off the veterans' loans, and the remaining 2.1 percent in cash.⁸

⁸Percentages of GDP per capita are calculated from information in Fishback and Wallis (forthcoming, Table 2). For descriptions of the ASCs see Administrator of Veterans' Affairs (1931, pp. 10, 42-44; 1936, pp. 1, 22-24).

The extent of the federal, state, and local relief programs in the U.S. during the 1930s is summarized in Table 3. The Veterans' Bonus of 1936 is not included in the figures because it was not a needs-based program. The best estimates of private aid and public aid from all levels of government are from studies of 114 cities by the Russell Sage Foundation and later the Social Security Board (Baird 1942). As the unemployment rate rose to a peak around 25 percent in 1932 and 1933, state and local governments increased their relief spending in the cities from 68 cents per capita in 1929 to \$12.20 in 1933. Private charities joined in and raised their spending from 43 cents per head to \$3.62 in 1932. Nationwide figures that include rural areas are available from 1932 and they show a similar rise from 1932 and 1933, as real relief expenditures as a share of peak 1929 GDP rose from 0.26 percent in fiscal year 1932 to 0.96 percent in fiscal year 1933. The New Deal expenditures do not show up in 1933 because the fiscal year ended on June 30 before the new Roosevelt programs had begun much spending.

Once the New Deal rolled into action, the federal government provided the funds for nearly 79 percent of all relief spending in fiscal years 1934 and 1935 (Table 3). After the renegotiation of relief responsibilities in the middle of 1935, the federal share began tailing off and fell below 70 percent in 1938 and 1939. As the federal government expanded its activity, private relief expenditures fell to less than a dollar per person. In a more formal analysis with controls for a variety of correlates, John Gruber and Dan Hungerman (2007) found that aid from churches declined significantly in areas where public relief expanded more.

In contrast to the Australian experience, however, the expenditures by the federal government on their long-standing public works activities expanded rather than declined. Distributions of highway funds to the states, funds for the Army Corps of Engineers for work on rivers and harbors, and loans from the Bureau of Reclamation for irrigation dams and works

more than doubled between the 1920s and the Hoover administration and then rose another 60 percent from this higher base under the Roosevelt administration (Fishback and Wallis forthcoming, Table 2).

How Successful were the Relief Programs in the U.S.?

Over the past decade I have been working with Shawn Kantor and several other scholars to examine the impact of New Deal policies. I will focus on the findings for relief and public work spending here. The studies are all based on the development of information across time for local areas, which involve states in some studies, cities in some, and counties in others. All the studies seek to identify the impact of the policy on the outcome in multi-variate analyses that control for a variety of other correlates, time-invariant features of the local areas, and nation-wide shocks. In quite a few cases instrumental variable (IV) analysis is used to control for endogeneity that tended to bias the coefficients toward finding no effect of the policy. The endogeneity bias often arises because the federal government and the states sought to increase relief spending in response to declines in economic activity or worsening health.

The rise in relief spending in the U.S. during the 1930s was successful at reducing several types of death rates. In an IV analysis of a panel of 114 cities for the years 1929 through 1940, Fishback, Haines and Kantor (2007, Tables 1 and 3) find that a one standard deviation increase in relief spending per capita was associated with the reduction of about -0.21 to -0.28 standard deviations (SDs) in the infant mortality rate, -0.21 SDs in the homicide rate, -0.85 SDs in the suicide rate, -0.58 SDs from infectious disease, and -0.38 SDs from diarrhea in large urban areas between 1929 and 1940. Greater relief spending also gave families enough income to allow them to return to more normal fertility rate. A one standard deviation rise in per capita relief

raised the general fertility rate by 0.82 SDs. Increases in economic activity, as measured by retail sales per capita also contributed to higher fertility rates. However, in a number of cases relief spending had different relationships with the death rates than the measure used for economic activity, retail sales per capita. One standard deviation increases in retail sales per capita were associated with increases of 0.07 SDs in the non-infant death rate, a rise of 0.17 SDs in the homicide rate, 0.22 SDs in the death rate from infectious diseases, 0.13 SDs in degenerative diseases and 0.252 SDs in motor vehicle deaths. Retail sales per capita had virtually no impact on infant mortality rates (Fishback, Haines, and Kantor 2007, Table 4).

Relief spending also contributed to reductions in property crime rates. Shawn Kantor, Ryan Johnson and Price Fishback (2010) examine crime rates in 81 cities during the 1930s. They find that work relief poverty programs, like the WPA, served to reduce property crime. A ten percent increase in spending on work relief was associated with a 1.5 percent reduction in property crime. In most specifications the effect of relief payments without a work requirement was smaller in part because people on direct relief were not having their hours soaked up by a work requirement during the day. Relief spending was not as successful as private employment in reducing property crime. The estimates suggest that a one percent decline in employment in a city was associated with a one percent rise in property crime rates in the 1930s.

The federal government's spending on emergency relief programs like the FERA and the WPA during the 1930s led to complaints by some employers that they created disincentives for workers to accept private employment, and thus work relief jobs in particular might crowd out private employment. The debate in the 1930s mirrored the long standing discussions of the issue in both the U.S. and Australia, which suggested that benefits for the unemployed provided an outside option that raised unemployed workers' reservation wage when seeking private

employment. What was unusual in the 1930s was that the unemployment rate was so high, over 20 percent in several years, that there seemed to be plenty of unemployed workers to soak up before crowding out could occur.

A series of labor market studies offer conflicting pictures of the impact of relief programs on private employment in the 1930s. Studies of cross-sectional data using IV estimation by Robert Fleck (1999) for county data in 1937 and 1940 and by John Wallis and Daniel Benjamin (1981) using city data in 1934/1935 suggest that areas with higher relief employment did not experience a reduction in private employment.

On the other hand, studies using panel data sets, which allow the research to take advantage of variation both across geographic areas and over time, find some degree of crowding out that varies across time. In the early years of the decade when unemployment was at its peak above 20 percent, Kent Matthews and Daniel Benjamin (1992) find that the addition of one work relief job reduced private employment by about one-third of a job. In that same period Todd Neumann, Price Fishback, and Shawn Kantor (2010) find a slight positive effect of relief spending on private employment. After 1935, when unemployment rates fell below 20 percent, both studies find that an additional work relief job was associated with a reduction of up to nine-tenths of a private job.

The relief jobs may have helped workers in ways that, oddly enough, caused the official measures of unemployment to rise. High unemployment rates often discourage workers from seeking work. These discouraged workers are not considered unemployed under standard definitions of unemployment, which require that someone be actively seeking work to be defined as unemployed. Meanwhile, during the 1930s relief workers were treated as unemployed in the official statistics. As a result, when a relief job in the 1930s became available and was filled by a

discouraged worker, the number of unemployed in the official statistics rose by one. Hence we see the odd effect that the creation of an additional relief job could make the official unemployment statistics look worse during the 1930s (Fleck 1999).

The impact of public works and relief programs extended well beyond the labor market. An added dollar of public works and relief spending in a U.S. county was associated with an increase in retail sales of roughly 40 cents (Fishback, Horrace, and Kantor 2005). Given typical ratios of retail sales to income, this suggests that incomes in the county grew roughly 85 cents at the mean when a dollar was added to public works and relief spending. Counties with greater public works and relief spending appeared to be more attractive to workers, as these counties experienced more in-migration during the 1930s (Fishback, Horrace, and Kantor, 2006; Sorensen, Fishback, and Kantor 2008).

Fishback and Kachanovskaya (2011) have estimated annual multipliers for federal government spending in the states. They develop a panel data set for all 48 states for the period 1930 to 1940 to focus on the period of highest unemployment. If there is ever a period where we would expect to see a high federal spending multiplier for the states, it would be during the period of extraordinary unemployment in the 1930s. The multiplier is small in direct OLS estimation with fixed effects. When IV analysis is used to control for endogeneity, the resulting multiplier implies that an additional dollar of federal relief and public works spending raised personal incomes within the state by somewhere between 90 cents and \$1.60. Hypothesis tests cannot reject the hypothesis that the multiplier is around \$1 for every \$1 in public works and relief spending. The boost to income did not carry over to employment in the private sector, as federal spending had a slight negative impact.

The predominant form of categorical public assistance came in the form of old-age assistance laws, first introduced by the states in the late 1920s and the early 1930s and then expanded by the creation of federal matching grants under the Social Security Act of 1935. The original state old-age assistance laws declared that one goal was to provide enough benefits to the elderly to live on their own. Dora Costa (1999) found that higher benefits under the federal matching grant version of old-age assistance established under the Social Security framework after 1935 allowed more women to live on their own. Leora Friedberg (1999) and Donald Parsons (1991) show that OAA allowed a significant number of elderly to stay out of the labor force.

OAA did not serve to reduced mortality rates of the elderly after controls for other factors are included. Even though raw correlations suggest that the introduction of OAA was associated with lower death rates among the elderly between 1930 and 1938, Stoian and Fishback (2010) find that death rates fell as much or more in the same states for other age groups not eligible for OAA. They suggest that OAA had little effect on death rates in the 1930s because it largely was substituting for benefits through almshouses and other programs that the elderly were receiving under the general poverty programs. Andreea Balan Cohen (2009) finds that OAA is associated with lower death rates in the 1940s and 1950s in part because a broader range of the elderly received benefits. In addition, new technologies like penicillin in the early 1940s meant that relatively small increases in benefits in the 1940s and 1950s could be used to purchase much more effective treatments of some mortal illnesses that had not been treatable in the 1930s.

How Effective was Relief in Australia?

Graham Snooks (1988, 312) argued that the unemployment relief efforts of the states likely had little effect on the recovery because they crowded out spending on other public works.

In essence, the state and local governments elected to try to aid more people with partial pay on work relief, while reducing the number of full-time full-pay public works.

The impact of relief spending potentially might have been different in Australia than in the U.S. based on the role played by the national government. In Australia, the relief spending was being funded by taxes and loans taken out by the state and local governments, so the extra taxes and anticipated repayment of loans may have stifled the salutary impact of relief spending. This was also true in the U.S. until 1933, when the federal government began distributing large amounts of funds. Thus, in America after 1932, there were opportunities for many cities to gain subsidies from taxpayers in other parts of the country.

The hypothesis of little impact can be tested for death rates, birth rates, and other demographic rates using the same type of local analysis of the impact of relief spending that we performed for the U.S. There is a caveat that the sample size for such a study is much smaller because Australia does not have nearly as many states and cities as there are in the U.S. However, once state fixed effects are introduced, the variation that is being used to identify the relationships is in the changes within the same state over time in both the U.S. and Australian studies. The number of years covered is almost the same as the number covered in our study of 114 American cities. The difference then arises because I am estimating an average of all of the relationships between relief and the demographic rates over time within 6 states in Australia as opposed to an average of 114 relationships cities in the American studies. The estimation procedures for Australia also help illustrate the methods used in the studies of the U.S.

I develop a panel data set for the 6 Australian states for the years 1929 through 1940 and then perform an analysis of the relationship between relief spending per capita and various

demographic measures. The following specification is then estimated for a panel data set in which each observation is an average for state s in year t .

$$O_{st} = \beta_0 + \beta_1 RPC_{st} + \beta_2 X_{st} + \Delta + \theta + \Delta * time + \varepsilon_{st} \quad 1)$$

where O_{st} is the outcome measure in year t and state s , RPC_{st} is relief spending per capita, and X_{st} is a vector of economic activity variables, including average manufacturing earnings for males in 1939 Australian pounds, the net production of rural goods per person in rural areas in 1939 Australian pounds, and the trade union unemployment rate. To control for factors in each state that did not vary across time within a state but varied across states, a vector Δ of state fixed effects is included. Such factors might include the legal environment, the climate, and the extent of large-scale water and sewage treatment facilities. A vector θ of year effects is included to control for factors that hit all states in the same year but varied across years, including national monetary policy, changes in international trade policy, and the introduction of new nationwide knowledge about medical treatments. Another vector of state-specific time trends ($\Delta * time$) is used to control for trends within each state that might have differed from state to state. The error term (ε_{st}) is the sum of all of the unmeasured factors.⁹

The coefficient β_1 is an estimate of the relationship between relief spending per capita and the outcome. If the RPS_{st} measure is not correlated with the error ε_{st} , then β_1 is an unbiased measure of the relationship, and economists tend to ascribe a “causal” relationship to the coefficient. To some extent, the inclusion of the X_{st} correlates, the fixed effects and state time trends control for endogeneity by reducing the number of variables that might be correlated with

⁹ In the Fishback, Haines, and Kantor (2007) analysis we included time trends for a series of variables and controlled for time trends in the dependent variable from the previous decade rather than estimating state-specific time trends.

both the relief spending per capita and the outcome. Even so, there may be a form of feedback endogeneity that works against finding an effect of relief spending on the outcome. The state governments may have responded to increased death rates with increased relief spending to try to stop the deterioration in the welfare of their citizens. In the American studies we often used instrumental variable (IV) analysis that entailed finding a variable or group of variables that are strongly correlated with relief spending per capita but uncorrelated with the error term ε_{st} in equation 1. It should be emphasized that the error term is composed of the unobservables after controlling for all of the other factors in the equation. We typically used a Two-Stage Least Squares (2SLS) approach in which a first-stage equation of the following form is estimated.

$$RPC_{st} = \alpha_0 + \alpha_1 Instrument_{st} + \alpha_2 X_{st} + \Delta_1 + \Theta_1 + \Delta_1 * time + u_{st},$$

Note that the equation includes all of the factors in the right hand side of the earlier equation along with the instrumental variable. Then a prediction of the Policy variable is substituted in the final stage outcome equation.

$$O_{st} = \gamma_0 + \gamma_1 PredictedRPC_{st} + \gamma_2 X_{st} + \Delta_2 + \Theta_2 + \Delta_2 * time + \varepsilon_{st},$$

This technique is designed to capture the impact of the portion of the actual policy measure that is correlated with the instrument and thus not correlated with the error term in the final equation. We used a variety of instruments designed to deal with a different types of endogeneity problems that depended on the outcome. The results can differ when using different instruments, but our results were generally robust to different instrument choices.

In general, improvements in earnings and economic activity had salutary demographic effects. Higher annual manufacturing earnings were associated with lower infant mortality rates and lower death rates. The results for Ordinary Least Squares analysis with state and year fixed effects, and state-specific time trends are listed in Table 4. They show that a one-standard-deviation (OSD) increase in per capita relief spending was associated with a -0.853 standard deviation reduction in the infant mortality rate. OSD increases in manufacturing earnings were also associated with a reduction in the overall death rate of -0.534 standard deviations and birth rate increases of 0.167 standard deviations.

The benefits of improvements in economic activity also carried over into rural production. An OSD increase in net revenue from rural production was associated with infant mortality rates that were -0.404 standard deviations lower, death rates that were -0.186 standard deviations lower, and higher marriage rates that were 0.323 standard deviations higher.

The one exception to this story of lower infant mortality associated with improved economic activity is the impact of trade union unemployment. When the employment situation worsened and trade union unemployment rate rose by a standard deviation, the infant mortality rate fell by -0.468 standard deviations.

The OSD effects for these measures of economic activity are generally larger than what we found in the study of 114 American cities (Fishback, Haines, and Kantor, 2007). The OSD effects for retail sales per capita, which was used as a proxy for economic activity, were around zero for infant mortality, 0.06 for non-infant death rates, and 0.36 for the birth rate. The OSD effects for specific death rates were typically less than 0.2 in absolute value.

The relationships between the demographic outcomes and per capita relief spending are conflicting. The OSD relationship for infant mortality was a positive 0.239, which contrasts with

the negative relationship that we found in all of our specifications in the American study. On the other hand higher per capita relief was associated with a lower death rate, although the OSD relationships are not statistically significant in both the Australian state and American city panels. Relief spending in Australia was associated with lower birth rates, in contrast to the effect of higher birth rates in America. Meanwhile, relief spending helped reduced the divorce rate in Australia with a -0.202 OSD effect.

A problem with endogeneity might be biasing the coefficient of relief spending per capita in a positive direction for the infant mortality rate. This would arise if the state governments followed a policy of increasing their relief activity in response to increases in infant mortality even after controlling for trade union unemployment, manufacturing annual earnings, net rural production per rural person and the various fixed effects and time trends. One potential factor might have been aspects of the downturn that hit the poor in ways not captured by the economic measures, which may be missing the problems in the nonunion, nonrural, and nonmanufacturing portions of the economy. Increased problems for the poor would have led to both an increase in infant mortality and likely generated increased relief spending per capita, a combination that leads to a positive bias in the coefficient estimated.

To combat the bias, I have explored the use of an instrumental variable (IV) approach for the equation with state and year fixed effects and state time trends included. I selected a Hausmann-style instrument that uses relief spending per capita in the rest of the country as an instrument for the changes in relief spending per capita in the state. For example, the instrument for relief spending per capita in New South Wales is created by calculating total relief spending in the rest of the states and dividing by population in the rest of the country to come up with a measure of relief spending per capita outside New South Wales as the instrument. The

relationship of spending in a specific state with spending elsewhere might have gone either way. Increased relief spending elsewhere may have allowed the state to raise relief spending without worries that people would seek to move to that state to gain relief work. On the other hand, the state might have reduced relief spending in hopes that people might move to the other states to gain relief work. The instrument meets one of the criteria of a good instrument if states in the rest of the country are not influenced by unobserved characteristics represented by the error term in that year for the specific state. Given the controls included in the analysis, this assumption does not seem unreasonable.

The second criteria for a good instrument is that it has strength and explanatory power in the first stage of the equation. This is testable with estimates of the Kleibergen-Paap Wald rank F-statistic for the coefficient of the instrument. If the reader is willing to accept weak instrument bias of 20 percent, the F-statistic of 7.15 that comes out of the estimation rejects the hypothesis of weak-instrument bias using critical values developed by Stock and Yogo (2002). To reject 10 percent weak-instrument bias, the F-statistic would have to exceed 16.38, so the coefficient on relief spending per capita is subject to some degree of weak instrument bias. The coefficient of the instrument in the first stage was negative suggesting that states reduced their own relief spending in response to increased relief spending elsewhere after controlling for all of the other correlates in the analysis.¹⁰

In the IV analysis the OSD effect of relief spending per capita in the IV analysis for the infant mortality rate is -0.210, but not statistically significant. The results suggests that there may have been some positive bias in the positive coefficient seen in the OLS regressions with fixed effects and state time trends. In the IV analysis for death rates, the effect of relief

¹⁰ Given Snooks' worries that relief spending crowded out other public works, I have also estimated the model with the combined total of relief and public works. The qualitative results are very similar and I do not report them here.

spending becomes more strongly negative with a statistically significant OSD effect of -0.429.

The relief spending also continues to contribute to decline in birth rates, with an OSD effect of -0.114

Summary

In response to the extraordinary unemployment of the Great Depression in both America and Australia, state and local governments greatly responded their provision of relief to the poor and unemployed. By 1932 Australia had already seen the trough of the Depression and the responsibility for relief remained with state and local governments even as unemployment rates remained well above 10 percent.

In the U.S., however, unemployment rates continued to rise through 1933 and the U.S. federal government began to consider unemployment to be a nationwide problem. The federal government under Franklin Roosevelt and a Democratic Congress therefore provided the lion's share of funding of unemployment relief for most of the rest of the decade.

Both countries provided most of the relief in the form of work relief jobs that paid substantially less than regular government public works jobs and controlled the number of hours worked. Payments per capita and relative to peak 1929 GDP continued to rise after 1933 even though unemployment rates fell somewhat.

How successful were the relief programs? Several recent studies for the U.S. situation suggest that areas with higher relief spending per capita contributed to increases in income and attracted new migrants to those areas. Relief spending helped reduce several types of death rates, reduced crime rates, and helped families return to more normal fertility patterns.

In new research for the Australian states the results suggest that increased income in manufacturing and rural production were associated with lower infant mortality rates and death

rates and higher fertility rates. Per capita relief spending was associated with lower death rates in IV analysis, but in contrast to the U.S. experience the per capita relief spending was associated with lower birth rates.

Much of the research on the Great Depression has long focused on the macroeconomic experience. In 1988 Robert Gregory and Noel Butlin edited a volume that examined the macroeconomic recovery from the Depression and taught us a great deal with comparative analyses of the experiences in Australia, Canada, the U.S., Japan, Britain, and New Zealand. This is a first attempt at comparing the microeconomics of the recovery in the U.S. and Australia. The results seem fruitful and I believe continued international comparisons will be even more revealing..

Figure 1

Sources: For Australia, see Haig (2001) and Butlin (1962). For the U.S. it is series Ca9 in Carter, et. al. (2006, p. 3-23).

Figure 2

Sources: For Australia Forster (1988, 295) reported adjusted and unadjusted estimates created by M. Keating. The U.S. unemployment rate that includes emergency relief workers as unemployed was created by Stanley Lebergott and reported in U.S. Bureau of the Census (1975, series D-9, p. 126) , while the estimates without them were constructed by Darby (1976).

Figure 3

Source: Federal government expenditures, revenues, and surplus/deficit are series Ea584, Ea585, and Ea586 from Carter, et.al. (2006, 5-80 and 5-81).

Figure 4a

Sources: See Figure 3 for deficit and figure 1 for GDP. GDP deflator with 1996 base was adjusted to 1939 base.

Figure 4b

Sources: Real GDP in 1938-39 pound is from Haig (2001). Deficit is Consolidated Revenue Fund Balance from Pincus (1988). The deficit is deflated to 1938-39 dollars using a GDP deflator created by dividing nominal GDP from measuringworth.com by Haig's (2001) Real GDP estimate.

Table 1
Australian Unemployment Relief Information, 1929-1939

Year	Unemployment Rate percent	Real Public Unemployment Relief Expenditures as Percent of 1929 peak real GDP Percent	Other Public Works by Commonwealth and State as Share of 1929 Peak GDP percent	Unemployment Relief per Family Receiving Relief 1938-39 £	Average Annual Male Earnings in Mfg. 1938-39 £	Ratio of Relief per Family to Annual Male Earnings
1929	6.7	0.54	1.00		325	
1930	9.8	0.63	0.86		338	
1931	16.4	1.20	0.50		327	
1932	19.7	1.90	0.32	19	326	0.059
1933	18.9	2.24	0.28	38	327	0.118
1934	16.0	2.39	0.31	94	315	0.300
1935	14.0	2.28	0.45	112	320	0.351
1936	11.0	2.28	0.78	112	315	0.355
1937	8.8	1.87	0.49	103	306	0.335
1938	7.5	1.86	0.56	106	320	0.332
1939	8.8	1.77	0.74	108	338	0.318

Sources: Estimates for Australian Public Unemployment Relief and number of families in receipt of sustenance are from Snooks (1988, 313, and 321). Real GDP in 1938-1939 dollars are from Haig (2001). A GDP deflator for 1938-1939 Australian pounds was created by dividing nominal GDP from the measuringworth.com website by the Haig (2001) Real GDP estimates. The nominal GDP estimates at measuringworth.com come from Mathew Butlin (1977). I chose this method because Noel Butlin had expressed significant reservations about the price deflator that he had developed for this period (Hutchinson undated).

Table 2
U.S. Relief Information, 1929-1939

Year	Unemployment Rate (including relief workers as unemployed) percent	Real Public Aid Expenditures as percentage of 1929 peak Real GDP percent	Federal Aid as Percentage of Total Public Aid percent	Public Aid Expenditures Per Capita 1939\$	Public Aid Expenditures Per Capita 114 cities 1939\$	Private Relief Expenditures per capita in 114 cities 1939\$	Public Aid Expenditures per Household 1939\$	Average Annual Manufacturing Earnings 1939\$	Ratio of Public Aid per Household to Mfg. Earnings Ratio
1929	2.9				0.68	0.43		1051	
1930	8.9				1.10	0.72		1021	
1931	15.7				2.76	2.51		1016	
1932	24.1	0.26	2.1	1.75	6.40	3.62		963	
1933	25.2	0.96	51.8	6.38	12.20	2.04	266	929	0.286
1934	22.0	3.13	78.9	20.67	20.20	0.99	379	964	0.393
1935	20.3	3.64	78.9	23.89	21.45	0.74	407	1027	0.397
1936	17.0	3.69	74.7	24.05	26.69	0.65	593	1090	0.544
1937	14.3	4.03	72.1	26.09	22.30	0.59	496	1133	0.438
1938	19.1	4.29	62.0	27.57	29.35	0.57	507	1092	0.464
1939	17.2	5.90	62.5	37.60	26.45	0.58	522	1153	0.453

Sources: Public Aid expenditures, number of Households helped, and federal share of public aid are from National Resources Planning Board (1942, 292, 557-561). Average Annual Manufacturing Earnings for the odd years 1929 through 1939 are from U.S. Bureau of the Census (1943, 20) with interpolations for the even years based on Average Manufacturing Earnings for Full-Time Workers. The full-time earnings and

the unemployment rate are from U.S. Bureau of Census, 1975, series D-739 on p. 166 and D-9 on p. 126). Public Aid Expenditures and Private Aid Expenditures per capita for 114 cities are compiled from information in Baird (1942) with population information for counties and cities from the U.S. Censuses of 1930 and 1940 available in digital form from Haines (undated). For the city relief payments the relief per capita measure is the total of all direct relief, work relief and private relief funds. Direct relief with no work requirement includes direct relief under the FERA and from state and local governments, and categorical assistance under the Social Security Act for dependent children, old-age assistance, and aid to the blind. Prior to 1935 the categorical assistance categories refer to funds provided by state and local governments through mothers' pensions, old-age pensions, and state aid to the blind. Work relief includes payments to workers on state and local government, FERA, CWA, and WPA projects. Private relief is the value of relief funds from private and public sources administered by private agencies. The total public relief payments for the U.S. as a whole include all of the above as well as payments through the Civilian Conservation Corps; the National Youth Administration programs; FERA special programs for transients, rural rehabilitation, emergency aid, and student education; Farm Security Administration Grants; unemployment insurance payments, and retirement and unemployment payments under the Railroad Retirement Acts.

Table 3

Results from Demographic Regressions with State and Year Fixed Effects and State-Specific Time Trends

Correlates	One Standard Deviation Effects for Different Dependent Variables <i>with t-statistics beneath</i>				
	Infant Deaths Per Thousand Births	Deaths Per Thousand People	Births Per Thousand People	Marriages Per Thousand People	Divorces Per Thousand People
Relief Spending Per Capita	0.239 <i>1.78</i>	-0.051 <i>-0.38</i>	-0.139 <i>-2.27</i>	-0.001 <i>-0.01</i>	-0.202 <i>-4.03</i>
Male Annual Mfg. Earnings	-0.853 <i>-3.21</i>	-0.534 <i>-2.48</i>	0.167 <i>2.03</i>	0.039 <i>0.11</i>	-0.159 <i>-0.69</i>
Trade Union Unemployment Rate	-0.468 <i>-1.96</i>	-0.079 <i>-0.25</i>	-0.023 <i>-0.49</i>	0.235 <i>0.63</i>	0.081 <i>0.27</i>
Net Rural Production per Rural Person	-0.404 <i>-2.88</i>	-0.186 <i>-1.48</i>	0.024 <i>1.07</i>	0.323 <i>1.49</i>	0.069 <i>0.38</i>
Year Dummies (1929 Excluded)					
1930	0.952 <i>1.94</i>	-0.575 <i>-1.11</i>	-0.432 <i>-2.05</i>	-0.272 <i>-0.42</i>	-0.090 <i>-0.17</i>
1931	0.691 <i>1.26</i>	-0.089 <i>-0.10</i>	-1.234 <i>-5.58</i>	-0.864 <i>-1.05</i>	0.059 <i>0.08</i>
1932	0.214 <i>0.33</i>	-0.280 <i>-0.35</i>	-1.755 <i>-6.73</i>	-0.391 <i>-0.59</i>	-0.217 <i>-0.31</i>
1933	-0.759 <i>-1.56</i>	-0.006 <i>-0.01</i>	-1.788 <i>-14.46</i>	-0.288 <i>-0.61</i>	-0.009 <i>-0.02</i>
1934	-0.990 <i>-2.13</i>	0.432 <i>0.86</i>	-1.916 <i>-12.17</i>	0.038 <i>0.23</i>	0.299 <i>1.08</i>
1935	-1.848 <i>-5.16</i>	0.193 <i>0.63</i>	-1.935 <i>-11.25</i>	0.653 <i>4.39</i>	0.659 <i>2.64</i>
1936	-2.381 <i>-9.45</i>	0.062 <i>0.15</i>	-1.629 <i>-12.76</i>	1.138 <i>2.38</i>	0.531 <i>2.09</i>
1937	-3.214 <i>-8.62</i>	-0.526 <i>-1.29</i>	-1.570 <i>-9.58</i>	1.113 <i>1.82</i>	0.414 <i>1.53</i>
1938	-3.299	-0.128	-1.597	1.438	1.115

	-9.70	-0.32	-12.69	2.10	2.43
1939	-3.234	0.307	-1.574	1.699	0.847
	-7.94	0.72	-15.68	2.37	1.67
State Dummies (New South Wales Excluded)					
Queensland	-3.574	-1.567	-0.010	0.496	-2.486
	-4.69	-1.48	-0.05	0.47	-2.85
South Australia	-3.031	-1.398	-1.233	3.642	-1.689
	-6.20	-2.78	-8.51	6.03	-3.37
Tasmania	-3.143	-0.967	0.756	1.133	-1.992
	-4.25	-0.91	3.30	0.95	-1.86
Victoria	-1.976	-0.297	-1.022	0.317	-1.573
	-3.69	-0.41	-7.13	0.43	-2.44
Western Australia	-0.761	-0.042	0.220	0.460	-0.970
	-2.95	-0.13	3.42	1.49	-3.75
Time Trends (New South Wales Excluded)					
Queensland	0.291	0.138	0.113	-0.035	0.035
	3.34	1.36	5.19	-0.38	0.44
South Australia	0.070	0.048	0.034	-0.228	0.046
	2.82	2.97	4.87	-8.91	2.41
Tasmania	0.142	0.051	0.094	-0.033	0.032
	5.14	1.46	10.95	-0.86	0.94
Victoria	0.050	0.141	0.045	0.001	0.075
	1.80	3.69	6.55	0.02	2.23
Western Australia	-0.076	-0.062	0.079	0.019	0.148
	-2.00	-3.23	7.32	0.63	5.57
Constant	2.865	0.452	1.252	-1.119	0.788
	11.05	1.22	12.88	-2.02	2.82

Notes and Sources. The t-statistics are based on standard errors clustered at the state level. The panel is composed of observations for 6 states for each year from 1929 through 1939. Relief spending is from Snooks (1988, 313), population is from the Australian Bureau of Statistics (2008), infant deaths per 1000 births (p. 58), net rural production (p. 85), marriages (p. 45), divorces (p. 47), deaths (p. 56), births (p. 52), male annual manufacturing earnings (p. 161), percentage of trade union membership unemployed (p. 152), the GDP deflator (p. 220), and the deflator for agricultural products (p. 217) are from Vamplew (1987). The deflators were adjusted so the 1939 value was equal to 100. The rural population was determined based on Census year estimates from Vamplew (1987, p.26) with straight-line interpolations between Census years. When estimating the regressions the variables were created by subtracting the mean and dividing by the standard deviations so the coefficients represent the number of standard deviations that the dependent variable changes with respect to a one-standard deviation increase in the correlate, also known as a one-standard-deviation (OSD) effect.

Table 4
Results from Demographic Two-Stage Least Squares Regressions with State and Year Fixed Effects and State-Specific Time Trends

Correlates	One Standard Deviation Effects for Different Dependent Variables <i>with t-statistics beneath</i>				
	Infant Deaths Per Thousand Births	Deaths Per Thousand People	Births Per Thousand People	Marriages Per Thousand People	Divorces Per Thousand People
Relief Spending Per Capita	-0.210 <i>-1.02</i>	-0.429 <i>-2.47</i>	-0.114 <i>-1.73</i>	-0.187 <i>-1.31</i>	-0.101 <i>-0.74</i>
Male Annual Mfg. Earnings	-0.541 <i>-2.18</i>	-0.271 <i>-1.19</i>	0.149 <i>3.12</i>	0.169 <i>0.81</i>	-0.230 <i>-0.94</i>
Trade Union Unemployment Rate	-0.089 <i>-0.32</i>	0.240 <i>1.61</i>	-0.044 <i>-0.89</i>	0.393 <i>1.30</i>	-0.005 <i>-0.02</i>
Net Rural Production per Rural Person	-0.233 <i>-1.75</i>	-0.041 <i>-0.32</i>	0.015 <i>0.73</i>	0.394 <i>2.29</i>	0.030 <i>0.17</i>
Year Dummies (1929 Excluded)					
1930	0.311 <i>0.97</i>	-1.115 <i>-3.50</i>	-0.395 <i>-2.56</i>	-0.539 <i>-1.42</i>	0.056 <i>0.11</i>
1931	-0.306 <i>-0.56</i>	-0.928 <i>-1.77</i>	-1.178 <i>-6.57</i>	-1.278 <i>-2.31</i>	0.285 <i>0.35</i>
1932	-0.416 <i>-0.60</i>	-0.811 <i>-2.54</i>	-1.719 <i>-9.73</i>	-0.653 <i>-1.65</i>	-0.074 <i>-0.12</i>
1933	-1.056 <i>-1.95</i>	-0.256 <i>-0.70</i>	-1.771 <i>-20.58</i>	-0.412 <i>-1.46</i>	0.059 <i>0.15</i>
1934	-0.842 <i>-1.86</i>	0.557 <i>1.94</i>	-1.924 <i>-17.26</i>	0.099 <i>0.74</i>	0.266 <i>1.50</i>
1935	-1.405 <i>-5.03</i>	0.566 <i>2.91</i>	-1.960 <i>-14.95</i>	0.837 <i>4.82</i>	0.559 <i>2.05</i>
1936	-1.608 <i>-4.05</i>	0.712 <i>3.37</i>	-1.673 <i>-15.26</i>	1.460 <i>3.32</i>	0.356 <i>0.92</i>
1937	-2.494 <i>-5.79</i>	0.080 <i>0.31</i>	-1.611 <i>-14.86</i>	1.412 <i>2.74</i>	0.251 <i>0.77</i>
1938	-2.637 <i>-5.61</i>	0.429 <i>1.55</i>	-1.635 <i>-16.12</i>	1.713 <i>2.89</i>	0.965 <i>1.95</i>
1939	-2.572 <i>-6.44</i>	0.864 <i>3.29</i>	-1.611 <i>-25.08</i>	1.974 <i>3.19</i>	0.697 <i>1.31</i>
State Dummies (New South Wales Excluded)					
Queensland	-2.858 <i>-4.24</i>	-0.963 <i>-1.62</i>	-0.051 <i>-0.44</i>	0.794 <i>1.10</i>	-2.648 <i>-3.19</i>

South Australia	-2.705	-1.123	-1.251	3.778	-1.763
	<i>-5.30</i>	<i>-1.96</i>	<i>-15.06</i>	<i>10.83</i>	<i>-3.79</i>
Tasmania	-2.332	-0.285	0.710	1.470	-2.176
	<i>-2.75</i>	<i>-0.29</i>	<i>5.58</i>	<i>1.78</i>	<i>-2.15</i>
Victoria	-1.710	-0.073	-1.037	0.428	-1.633
	<i>-3.35</i>	<i>-0.13</i>	<i>-11.93</i>	<i>0.90</i>	<i>-2.92</i>
Western Australia	-0.653	0.048	0.214	0.505	-0.994
	<i>-3.06</i>	<i>0.22</i>	<i>5.39</i>	<i>2.68</i>	<i>-4.45</i>
Time Trends (New South Wales Excluded)					
Queensland	0.275	0.125	0.114	-0.042	0.038
	<i>3.90</i>	<i>1.68</i>	<i>7.96</i>	<i>-0.79</i>	<i>0.59</i>
South Australia	0.022	0.007	0.037	-0.248	0.057
	<i>0.78</i>	<i>0.25</i>	<i>6.98</i>	<i>-12.91</i>	<i>2.40</i>
Tasmania	0.118	0.031	0.095	-0.043	0.037
	<i>3.90</i>	<i>0.87</i>	<i>19.81</i>	<i>-1.76</i>	<i>1.17</i>
Victoria	0.045	0.136	0.046	-0.001	0.076
	<i>1.69</i>	<i>4.46</i>	<i>9.99</i>	<i>-0.06</i>	<i>2.81</i>
Western Australia	-0.002	0.001	0.075	0.050	0.131
	<i>-0.05</i>	<i>0.03</i>	<i>6.17</i>	<i>1.52</i>	<i>3.95</i>
Constant	2.436	0.091	1.276	-1.297	0.885
	<i>8.68</i>	<i>0.31</i>	<i>21.06</i>	<i>-2.91</i>	<i>2.69</i>

Notes and Sources. See Table 3. The instrument is real per capita relief spending by the rest of the states. The coefficient on the instrument was negative in the first-stage regression. The Kleibergen-Paap rank k Wald F-statistic for the instrument is 7.15.

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