The Impact of Forced Migration on Modern Cities: Evidence from 1930s Crop Failures*

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First Draft: November 15, 2014
This Draft: January 14, 2016

* We would like to thank James Choi, Shawn Cole, Joshua Coval, Richard Freeman, Robin Greenwood, Charles Weeks, and seminar participants at the NBER Development of the American Economy 2015 Meetings, Clemson University, Florida State University, Georgia State University, Harvard Business School, and Tulane University. We also thank Barbara Esty, Trung Nguyen, and Catherine Zagroba for excellent research assistance. We are grateful for funding from the National Science Foundation.

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ABSTRACT

We find that a sizable portion of current city-level variation in unionization was set in place during the 1930s, and that this *exogenous* unionization has a real impact on city-level economic outcomes today. First, we show that the driving factor behind these city-level differences was random, and a result of substantially different rainfall levels during the Dust Bowl. We find that individuals in drought-ridden areas were significantly more likely to migrate to close-by cities. Workers in these cities - facing an influx of rural migrants - then became far more inclined to unionize than those facing less competition for their jobs. Using this rainfall (and the resultant crop failures) in surrounding counties to generate exogenous variation in city migration inflows, we show that random differences in the drought-laden 1930's rainfall predict migration patterns, and variation in union formation rates that persist through today. These exogenous events explaining a sizable percentage of cross-sectional geographic variation in current unionization challenges explanations of unionization as a necessary response to work-place conditions. Furthermore, and importantly, we show that this exogenous unionization that persists through today predicts variation in key city-level economic outcomes such as level of education, establishment growth, and the presence of high-value industries.

Labor unions continue to occupy a central role in debates regarding the evolution and trajectory of the U.S. economy. Much of this debate surrounds the impact of labor unions on a host of important outcomes, ranging from wage policies, to worker productivity, to employment contracts, all of which ultimately factor into the productive capability of firms. However, much less attention has been paid to the question of why we see, even today, such large variation in unionization rates across seemingly identical tasks and work conditions. For instance, why do identical jobs, performed in identical conditions, for identical end outputs, become unionized in some instances, while remaining non-unionized in others? Both theoretical and empirical work on unionization has had a difficult time reconciling this fact in the data, and yet answering this basic question is critical for understanding the role of unions more broadly.

In this paper, we show that a sizable portion of the unionization rates that we observe today are explained by random, exogenous shocks that took place many decades ago. We trace the random origins of unionization back over 75 years, and show that severe droughts in the 1930s--caused by exogenous differences in rainfall across geographic regions—led to substantial geographic variation in crop failures across different states and cities. These major crop failures, which led to widespread migration from farms to cities, generated exogenous increases in city-level worker inflows. The labor inflows then put pressure on local workers to organize in order to protect their jobs and wages. In particular, we use county-

level rainfall during the major drought years of 1930, 1934, and 1936 as an instrument for current unionization rates, and show that differences in drought-year rainfall predict variation in migration, and resulting union formation, across states and cities (MSAs). Importantly these randomly generated cross-sectional differences in unionization, formed during this period, remain largely stable up to 75 years later. Meanwhile, differences in rainfall during non-drought years (such as 1931 and 1935) in the *exact* same MSAs, which were not associated with subsequent crop failures, do not lead to variation in migration or unionization across states, negating any geography- or other time period-specific explanation.[1]

While it is true that these droughts may have induced selective migration – for instance, only farmers surrounding cities where they perceived good employment prospects may have migrated to these cities - our IV regression is designed to pull out *precisely* the part of migration that is caused by the exogenous drought itself. The critical finding is therefore that this exogenous migration had such a striking impact on setting unionization rates, the footprint of which we still observe today.

The motivation of the paper comes partly from the simple observation, which we document empirically, that a sizable portion of the *cross-sectional* variation in unionization that exists in today's cities and states was set in place during the 1930s. While it is not surprising that aggregate unionization had a

[1] Any purely geographic based explanation is ruled out by the fact that variation in rainfall in the exact same MSA locations predicts nothing in the non-drought years (e.g., 1931 and 1935). However, even a more nuanced location-time period specific variable, such as a general trend across these locations in the 1930s, is also ruled out, as it would have had to turn on in 1930, off in 1931, on again in 1934, off again in 1935, etc., which seems implausible.

large surge in the 1930s (due to the passage of the Wagner Act in 1935 and the endogenously associated labor sentiment nationwide (Freeman (1998)), the fact that this cross-sectional variation in percentage and ranking has remained so stable since then is striking. To be clear, this is *within-industry* variation, so that it has nothing to do with industrial make-up today (or changes in industrial make-up in the 1930s), but instead can be thought of as the same job being done in different places having differing levels of unionization.

This result points to something that happened during the 1930s that is still impacting unionization today. The first way we see this is by finding that 1939 unionization levels at the state level strongly and significantly predict (cross-sectional) state unionization levels in 1953, 1963, 1973, etc. all the way up to 2013. However, we find no such predictably using the 1929 state unionization levels (indicating that something between the 1929 and 1939 period is driving the difference in predictability).

We then turn to the cause of this phenomenon. In particular, we examine the severe droughts of the 1930s that plagued only specific regions of the U.S. and solely during certain times - sometimes referred to as the "Dust Bowl" period in the mid-west (see USDA (1936)) – in order to isolate exogenous region- and time-specific variation. We show that these severe weather episodes had statistically and economically large predictability for migration patterns from farms into cities. We then show that this exogenously determined migration (the part of migration driven solely by the severe droughts) had explanatory power for the cross-sectional variation in unionization rates during this same time period. We then show that

this exogenously, weather determined (or "random" component) of unionization helps to explain a significant percentage of cross-sectional variation (again within-industry) in unionization rates across cities today.

In terms of specific tests, we use a number of specifications and measures, along with multiple falsification and placebo tests to ensure that we are isolating the impact of the large cross-sectional and time-series variation in severe weather shocks on union formation in the 1930s through this migration channel. Reduced form tests of unionization in 1939 on severe weather during the drought years of the decade (which we measure multiple ways – using rainfall, average temperatures, the Palmer Drought Index – all of which yield large and statistically significant impacts) imply that, for instance, a one standard deviation decrease in the overall drought index (more severe drought) in a state predicts unionization rates that are 3.3% higher (t=2.75); relative to an unconditional average unionization rate of 17.0%, this implies a 19% increase in the unionization rate. As a placebo test for this result, we show that variation in the exact same states, for the identical index over the same decade (1930s), but not during drought years (e.g., during 1931 and 1935) had no impact on migration and no predictability for subsequent unionization levels across states.

Our main findings are then that purely exogenous (random) variation in unionization caused by severe droughts in the 1930s has significant impacts on unionization rates today. This has important implications for thinking through the role and impact of unionization more broadly. In particular, by showing that random unionization persists for 75 years, this challenges many of the proposed

theoretical frameworks (and commonly cited motivations both for and against unionization). If unionization is a response to workplace needs, then any random, exogenous variation should be corrected over time. Even with frictions, 75 years is roughly 30 times longer than the average establishment-life, so seems long enough for these exogenous shocks to dissipate. Alternatively, if unionization is a neutral mutation, we can expect exogenous perturbations (a kind of "random assignment") to have long-lasting impacts, with no large welfare implication. However, unionization as a neutral mutation does not square with its central and deep importance in the literature. This presents a fascinating puzzle regarding the origins of unionization, which must be considered along with the vast literature (and normative implications from that literature) regarding the marginal value of unionizing (or de-unionizing) at any given firm.

I. Data and Summary Statistics

We draw from a variety of data sources to create the data sample used in this paper. Our primary tests are conducted at the state- and MSA (metropolitan statistical area)-level. To map counties to MSAs, we use links provided in the historical Census files.

Measures of union activity are drawn from the various sources. Union membership from 1986 to 2013 are drawn from the Union Membership and Coverage Database, available at www.unionstats.com and compiled by Barry Hirsch and David Macpherson using the Current Population Survey (CPS). These measures are aggregated at the city/MSA-level, are available for most medium- to

large-sized cities in the United States, and consist of the total number of private sector union employees in the given city. We also obtain state-level measures of private sector unionization for 1939 and 1953 from Leo Troy in Troy (1953) and Troy and Sheflin (1985) Union Sourcebook. We compile our own measure of state-level union activities for 1929, as no such measure has been conducted prior to this research. Statistics of union membership for all union organizations in 1929 can be obtained from the 1929 edition of the Handbook of American Trade-Unions. The Handbook of American Trade-Unions contains total membership for each national union organization and the number of affiliated local unions in each state. Using these, we estimate the state-by-state membership for each national union organization and accumulate the membership of all local unions for each state to produce the state membership figures. We further confirm the consistency of our estimates by collecting proceedings of all state federation of labor meetings in 1929. Each annual proceedings contains either direct statistics of state membership, or financial reports of dues receipts or per capita payments received by local unions, which then can be used to extract state-level membership numbers.

For our instrumental variables approach we use a variety of demographic and employment statistics from the 1930 U.S. Census, the 1940 U.S. Census, as well as annual demographic surveys, available online through the U.S. Census Bureau website. Specifically, we extract population figures, unemployment rates, industry employment breakdowns, and ethnic origin statistics, broken down by state and major metropolitan area, for the 1930 and 1940 censuses. We also hand collected MSA-level internal migration data from 1935 to 1940 from the 1940 U.S.

Census and from MSA-level internal migration data from 1955 to 1960 from the 1960 U.S. Census. We are particularly interested in the origin and other characteristics of internal migration so we collect statistics for in-migrations from "Balance of State" and in-migrations from "Rural-farms" to the MSAs. We use annual county-level and state-level measures of rainfall and crop failures, drawn from the U.S. Census. Furthermore, we obtain county- and state-level rain, drought and temperature data from the National Climate Data Center.

Table I provides summary statistics and correlation coefficients for the state- and MSA-level unionization rate and summary statistics for other main variables used in our analysis. Variables in panel A1-A3 are at the state-level and variables in panel B1-B3 are at the MSA-level. Panel A1 and B1 report summary statistics for state-level and MSA-level unionization rates, respectively. Panel A2 reports the correlation coefficients for state-level unionization rates from 1929 to 2013 and the average state-level rain for drought years 1930, 1934, and 1936. Unionization rate in 2013 is strongly correlated with unionization rate from 1939 to 2003, but not correlated with unionization rate in 1929. Also, rain in drought years is negatively correlated with all state-level unionization rates from 1939 to 2013. Panel B2 shows the correlation of MSA-level unionization rate for 1986, 1993, 2003, and 2013, rain_d and other variables of interest. Average rain around MSAs in drought years 1930, 1934, and 1936 is negatively correlated with MSA-level unionization rates. We explore these relationships more carefully in a regression framework below.

II. The Great Depression and the Origins of Cross-Sectional Differences in Unionization Rates in the US

A. Persistence in Cross-Sectional (State-Level) Unionization Rates

In this section we describe our approach. As noted earlier, we develop a novel identification strategy that exploits the historical origins of differences in unionization rates across states and MSAs. Our empirical strategy is motivated by a striking pattern displayed in Figure 1.

Figure 1 plots state-level unionization rates across time, for all 50 states in the U.S. To be specific, these unionization rates represent the percentage of the private sector workforce in a given state that is part of a union; this ratio is also known as the "state union density." As the first two panels show, much of the cross-sectional variation in unionization rates was formed long ago, specifically in the 1930s; perhaps even more interestingly, the state-level union density ranks appear very stable since around 1940, all the way up until to the present. The last panel of Figure 1 reinforces this point, and shows that the average absolute change in the rank of state-union density (i.e., if a state moved from having the highest unionization to the lowest unionization rate, this would induce a large change in this number) has remained very stable since the 1940s; virtually all of the cross-sectional change in unionization rates across states happened before 1940. Since

then, these rankings across states have been remarkably stable.

Additionally, the magnitude of the differences across states, as shown in the first panel of Figure 1, is quite large, with some states reporting unionization rates of over 50% in the 1950s, with others reporting less than 10% at that time; and even though average unionization rates as a whole (across the entire U.S.) have declined steadily since the early 1950s, there are still large cross-sectional differences across the 50 states, with some states reporting union densities between 20-25% and others between 3-5%, as of 2013.

Next we explore the nature of the persistence of cross-sectional unionization rates in more depth. Specifically, in Panel A of Table II we run cross-sectional regressions with the state-level unionization rate of all U.S. states (excluding Hawaii and Alaska, given they did not exist for comparison) as of 2013 on the left-hand side, and state-level unionization rates from 1929, 1939, 1953, 1964, 1973, 1983, 1993, and 2003 on the right-hand side. We include controls for the state-level share of manufacturing in 1930, the state-level unemployment rate in 1930, the state-level unemployment rate in 2010, and the state-level population in 2010. In Panel B we run identical regressions but instead replace the unionization rates with the state-level unionization rate *ranks* across all states.

Both Panels A and B tell a similar story. While the unionization rate in 1939 is a large and significant predictor of unionization today (coefficient=0.211, t=3.53), unionization rates in 1929 do not predict current unionization rates. Panel B finds a similar result using state-level unionization ranks as opposed to unionization rates. And consistent with the idea that these cross-sectional

differences have been quite persistent *since* 1939, Panels A and B show that every other unionization rate variable since 1939 is a large and significant predictor of current unionization rates.

Taken as a whole, the findings in Figure 1 and in Table II indicate that a large *cross-sectional* shock to unionization rates occurred during the 1930s, and it led to large and persistent *cross-sectional* heterogeneity in unionization rates across states that still exists today. To be clear, it is not surprising to see the absolute levels of unions rising in the 1930s (given the passage of the Wagner Act in 1935) – instead, what is remarkable is that whatever set the cross-sectional differences between regions in the 1930s had lasting impacts up through the present. The rest of our analysis proceeds directly from this observation.

B. Shocks to Cross-Sectional Unionization Rates: The Impact of Crop Failures and the Dust Bowl Experience of the Great Depression

Motivated by these striking post-1930s patterns in the data, the next part of our analysis focuses on the 1930s decade itself. The key question we seek to answer is: what specifically occurred during this period that had such a large and long-lasting impact on unionization rates in the U.S.?

Our hypothesis, which we test empirically below, is that these patterns in the data were (in part) caused by random, severe weather-related shocks to certain areas during this decade. In particular, numerous anecdotal accounts stress the profound impact of the "Dust Bowl" experience during the 1930s, and specifically

the effect of severe droughts during certain years over this time period (US Department of Agriculture (USDA) 1936, Ganzel (2003)). These droughts caused substantial crop failures, particularly in 1930 along with the Dust Bowl years of 1934 and 1936, and led to widespread migration from farms to cities, as farmers' lands became fallow and unharvestable. For example, the 1930 drought (known as the Great Drought of 1930 (Hamilton (1982)) along with the Dust Bowl of the mid-1930s, was known to have had profound impacts on the crop-failure, soil usage, and resultant migration patterns of farmers into cities (USDA (1936)). These labor inflows into cities then put pressure on local workers to organize in order to protect their jobs (Blanchflower et. al (1990)).

Importantly for our identification, there were also *differential* effects of these droughts. In particular, crop failures (driven exogenously by differences in rainfall) had differential impacts on certain US cities relative to others. In addition, as shown in Figure 2--which maps the "Palmer Drought Severity Index" for each year from 1930-1940—only certain years during this decade were associated with severe droughts, while others were not. In particular, as noted above, the years 1930, 1934, and 1936 (as can be seen in Figure 2, and described in Ganzel (2003)) were associated with severe droughts, while the intervening years and the years immediately after were not. Given that the distribution of rainfall across these regions and years are exogenous, this motivates our use of this time period, and these events, as exogenous shocks.

Putting all of this together, our empirical strategy thus entails testing the idea that differences in cross-sectional (state-level) unionization rates were formed

during this time period directly as a result of these random, weather-related shocks. Table III provides our first test. In this table we run cross-sectional regressions at the state-level to explain unionization rates in 1939, using state-level measures of the drought experiences in the 1930s as independent variables. Specifically, we use the following state-level variables to measure droughts: a) the state-level average Standardized Precipitation Index over the drought years 1930, 1934 and 1936, which we term "Rain_d"; b) the state-level average Palmer Drought Severity Index (PDSI) during these same years, which takes values from -5 to 5 (centered around zero, where larger numbers imply more rain) and which we term "Drought_d"; d) the state-level average of the maximum temperature in these drought years, which we term "MaxTemp_d"; and e) the state-level average of the average temperatures in these drought years, which we term "AveTemp_d." We also control for state-level unionization rates in 1929, state-level unemployment rates in various years, the state-level percentage of manufacturing in 1930, and the state-level population in various years. Lastly, note that all of the results in this table are unchanged if we replace these averages computed over the 1930, 1934, and 1936 drought years with the figures for any of these individual drought years instead.

Panel A of Table III shows that each drought measure is a large and significant predictor of unionization rates in 1939, and each works in the hypothesized direction. The amount of rain (Column 1), and the drought severity index (Column 2), both of which are positively related to moisture and crop yield, are strong negative predictors of future unionization rates. Meanwhile, the

temperature variables (in Columns 3 and 4), which are negatively related to moisture and crop yield, are both positive predictors of future unionization rates. The magnitude of this effect is substantial. For instance, Column 1 implies that a one standard deviation decrease in the Moisture/Severity Index in a state predicts unionization rates that are 3.3% higher; relative to an unconditional average unionization rate of 17.0%, this implies a 19% increase in the unionization rate.

Panels B and C of Table III repeat the rain and drought regressions, but simply replace the dependent variable with the unionization rates in future years (1953, 1964, 1973, 1983, 1993, 2003, 2013). Panel B shows that the impact of the severe weather shocks in the 1930s on unionization rates extends out roughly 75 years, all the way to present-day. Specifically, the coefficient on Rain_d (measured in the 1930s, as described above) is a negative and significant predictor of unionization rates for each decade, including the 2013 figure. Panel C of Table III indicates a similar level of long-lasting predictability when using the Drought_D measure, instead of rainfall.

C. Falsification Test: Non-Drought years of the 1930s for the same States

Next we run a falsification test of there being something fundamentally different about these states that we are identifying with low rain. Although rain is exogenous, one might argue that states with low rain in the 1930s are spuriously lining up with unionization rates decades later. We thus test the rainfall in the *exact same states* in years where there was no drought (for instance, the two highest rain years from Figure 1, 1931 and 1935). We term this variable

"Rain_nd," and define all the other weather measures analogously; we then report these results in Table IV. Panel A of Table IV shows that rain in these non-drought years in the exact same states has *no* predictive power for future unionization, as the magnitudes are small and insignificant. In addition, as shown in Panels B and C of Table IV, these severe weather measures (e.g., both Rain_nd and Drought_nd) have no predictability for future unionization rates beyond 1939; not a single future unionization coefficient is significantly different from zero, and the implied magnitudes are small as well. This lends credence to our identifying truly important, exogenous variation that shaped unionization across states.

D. IV Test on 1939 Unionization

Next we turn to explicitly instrumenting for unionization in 1939 with our exogenous shocks from the 1930s. In other words, we aim to test whether solely the exogenously determined piece of unionization in 1939 (determined by the droughts of the 1930s) has predictive power for growth rates of cities 75 years later.

We report these results in Table V. Column 1 shows the first stage of this regression, which regresses 1939 unionization on rainfall from the 1930s.[2] Columns 3 and 5 then show that the instrumented 1939 unionization rate has the same impact that we showed earlier in Table II, namely a strong, and significant predictive effect (coefficient=0.249, t=4.14; and coefficient=0.210, t=3.44) on

[2] We do not include state fixed effects here, as they, not surprisingly absorb nearly all of the variation in regional rainfall. For instance, running drought year rainfall on a simple set of state fixed effects yields an R2 of 84%.

future state-level unionization rates in 2003 and 2013, respectively.

E. MSA-Level and Migration Flow Tests

Next we exploit more granular data at the metropolitan-statistical-area (MSA)-level. Looking at the MSA-level enables us to exploit more granular variation in the rainfall data, and also to explore the mechanism of city-level migration inflows in more depth. We begin by running similar regressions to those from Table III, but this time at the MSA-level. Specifically, Table VI reports regressions of MSA-level unionization rate in 2013 on various measures of rain surrounding the MSA. We measure "Rain_1934_in" as the MSA-level average Standardized Precipitation Index inside the MSA in 1934; we define "Rain_1934_50," and "Rain_1934_100" as the the MSA-level average Standardized Precipitation Indices within the 50 and 100 miles radius of the MSA; we define "Rain_d" as the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936);" and lastly "Rain_nd" is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the *non*-drought years (1931, 1932, 1933, 1935 and 1937). We also include the following control variables: MSA_perf_manuf_1930, which is the MSA-level percentage of manufacturing in 1930; as well as MSA_unemployed_*y*, MSA_pop_*y*, MSA_perc_manuf_*y* and MSA_area_*y*, which are the MSA-level unemployment rate, the MSA-level population, the MSA-level percentage of manufacturing and the MSA-level area in year *y*. Panel A reports regressions using the MSA-level unionization rate in 2013

as the dependent variable, and Panel B uses MSA-level unionization rates in 1986, 1993, 2003 and 2013 as the dependent variable.

Table VI presents these results. Panel A demonstrates that MSA-level rainfall in the 1930s is a strong predictor of MSA-level unionization rates today. Consistent with the results in Table III, this fact is true for each measure of severe weather that we use. In terms of the magnitude, Column 4 implies that a one-standard deviation lower drought-year rainfall around an MSA predicts unionization rates that are 2.3% higher; relative to an unconditional average 2013 unionization rate of 6.9%, this implies a 33% increase in the MSA-level unionization rate today. Panel A also shows that rainfall solely within the MSA, and at various ranges within the immediate neighboring area (from 50-100 miles) also impacts MSA-level unionization rates. And importantly, the placebo test at the MSA-level of using non-drought year rainfall measures again indicates that rainfall in these years do *not* impact unionization rates. Finally, Panel B indicates that MSA-level severe weather shocks in the 1930s also significantly impact MSA-level unionization rates in 1986 (which was as far back as we could obtain this data), 1993, and 2003 (in addition to 2013). Collectively, these results reinforce the earlier state-level findings and demonstrate that these weather shocks had significant impacts even at the more granular MSA-level.

Next we explore the impact of migration from rural areas into cities, which is the hypothesized mechanism through which crop failures and severe weather shocks led to increases in unionization. In particular, we explore the extent to which migration into an MSA from regions immediately outside the MSA (yet

within the same state) are explained by the severe weather shocks described above. To do so, we run regressions of MSA-level in-migrants from the balance of a state on various measures of rain surrounding the MSA. In particular, Table VII, Panel A reports a regression of in-migrants from the balance of a state from 1935 to 1940 on neighboring weather shocks in the 1930s, and Panel B reports a placebo test of regression of in-migrants from the balance of a state from 20 years later (1955 to 1960) on neighboring weather shocks in the 1930s.

Table VII, Panel A indicates that rain in the regions immediately surrounding an MSA during the 1930s (drought years) had a significant impact on migration into cities (MSAs) during the late 1930s. Meanwhile rain in these same regions during non-drought years has no effect on in-migration into cities during this time period. Similarly, as shown in Panel B, these severe weather shocks in the 1930s have no impact on subsequent migration into these cities 20 years later (1955-1960). So, severe rain variation in the 1930s is not related to general migratory patterns, it is only during this specific time period of the 1930s, which is consistent with anecdotal accounts on the impact of the Dust Bowl experience on migration flows into cities.

Next we seek to identify the portion of in-migration directly caused by rainfall, and using this to predict subsequent unionization rates. To do so, we explicitly instrument for in-migration from 1935-1940 using drought-year rainfall in the 1930s in the first stage. We then use this instrumented measure of in-migration (which we term "forced migration") into cities to predict unionization

rates many decades later.[3]

Table VIII presents these results. Panel A of Table VIII shows that forced migration into MSAs (caused by severe weather) has a significant impact on MSA-level unionization rates in 1986, 1993, 2003, and 2013. Panel B then reports regressions of *state-level* unionization rates in 1939 on the instrumented *average* in-migrants from the balance of a state for all MSAs in that state from 1935 to 1940; Panel B indicates that forced migration is again a significant predictor of state-level unionization rates in 1939.

In our next set of tests, we build on this finding in Panel B that forced migration (from rural areas within a state into the cities/MSAs of that state) predict state-level unionization, and use this to predict *subsequent* state-level unionization rates (beyond just 1939). In essence, we run a 3SLS (three-stage least squares) regression of state-level unionization rates on instrumented unionization rate in 1939, where the instrumented unionization rate in 1939 is instrumented by the instrumented in-migrants from the balance of a state from 1935 to 1940; and where in-migrants from the balance of a state from 1935 to 1940 is itself instrumented by neighboring drought-year rainfall in the 1930s as described in Panel B of Table VIII.

Table IX shows that this measure of instrumented unionization in 1939, designed to capture solely the piece of 1939 unionization caused by forced

[3] Again, a large part of migration is surely selection, and even further, it is true that droughts may have caused selected migration – for instance, only farmers surrounding cities where they perceived good employment prospects may have migrated to these cities. However, our IV regression addresses exactly this – it pulls out *solely* the part of migration that is caused by the exogenous drought.

migration into cities in the wake of the 1930s droughts, had a significant and persistent impact on state-level unionization up to 75 years later. This finding suggests that these exogenously-induced labor migrations into cities were indeed the mechanism which led to a significant piece of the differential - and highly persistent - unionization rates that we observe today across cities in the U.S.

F. Robustness

In this section, we perform a set of additional robustness and falsification tests. We first show that our key result is not driven simply by these exogenous shocks impacting the future share of manufacturing in a given MSA, and hence impacting unionization indirectly through this channel. Table X replicates the tests in Table VIII, but replaces the left-hand side variable with future manufacturing shares in a given MSA (as opposed to future unionization rates). Table X shows that neither the basic rain/drought measure ("Rain_D"), nor the instrumented value of forced migration (caused by severe weather, and labeled "IV InMigState_3540" in this table) is a significant predictor of future MSA-level manufacturing shares.

Table XI then performs another falsification test, by exploring if the exogenous weather events we explore in our tests can explain unionization rates *before* these weather events even occurred. To do so, we repeat the regressions from Table III, but replace the left-hand side variable with the state-level unionization rate in 1929, which is before the drought episodes we use as instruments. Table XI shows that the rain and drought measures are not

significant predictors of state-level unionization rates in 1929, in stark contrast to the results from Tables III and IV showing that the severe weather shocks in the 1930s are significant predictors of *future* state-level unionization rates.

G. Explaining the Total Share of Unionization Today

In this last section, we attempt to quantify the magnitude of the impact of forced migration (due to weather shocks) in the 1930s on unionization today. In Column 2 of Table XII we highlight the adjusted-R2 of our baseline MSA-level cross-sectional regression that attempts to explain unionization rates in 2013; given our set of control variables, the adjusted-R2 of this regression is 15.02 percent. In Column 3 we then add the instrumented value of forced migration (computed as in Table VIII) to this regression; the adjusted-R2 rises to 28.05 percent. Thus the forced migration events of the 1930s increased the explanatory power of this regression by almost 13 percentage points; and as a share of the original adjusted-R2 regression, increased the explanatory power by over 86 percent. This confirms that a surprisingly large share of cross-sectional unionization rates today can be explained by random events that occurred over 75 years ago.

III. Conclusion

This paper documents that a sizable portion of the difference in unionization rates across cities in the United States is ultimately driven by exogenous (random) variation. In particular, the severe droughts of the 1930s – dispersed randomly

across U.S. regions and across time – generated exogenous time- and region-specific shocks that caused differential weather-forced migration patterns that pressured current workers in affected cities to unionize. These differences in unionization – *within-industry* (i.e., for the same job producing the same output) – persist 75 years later up through the present. To give an idea of the magnitude of this effect, from the reduced form analysis, a one standard deviation increase in the state-level drought index during the drought years of the 1930s increased state-level unionization rates over the decade by 3.3% (t=2.75); compared to an unconditional average unionization rate of 17.0%, this implies a 19% increase in the state-level unionization rate. We also run our analysis at the more granular MSA-level, and find even larger effects.

We do a host of placebo and falsification tests to nail down the severe weather episodes of the 1930s (often referred to as the "Dust Bowl") as the cause of the migration and ultimate unionization differences that we observe. In particular, we first show that 1929 cross-sectional variation in unionization rates has no predictability for future unionization while 1939 cross-sectional unionization rates have strong predictability up through the present (thus isolating the 1930s decade as the important variation). We then show that over this same time period (1930s), variation in the identical drought measures in the identical locations, but during non-drought years (e.g., 1931 and 1935) had no impact on migration and no predictability for subsequent unionization levels across states. This rules out any purely geographic based explanation, as variation in rainfall in the exact same MSA locations predicts nothing in the non-drought years (e.g., 1931 and 1935).

However, even a more nuanced location-time period specific variable, such as a general trend across these locations in the 1930s, is also ruled out, as it would have had to turn on in 1930, off in 1931, on again in 1934, off again in 1935, etc., which seems implausible.

In sum, we present evidence that a sizable portion of the unionization rates that we observe today are explained by random, exogenous shocks that took place many decades ago. We believe this is a critical component of the conversation surrounding unions, as any argument (either for or against) the marginal unionization event at a firm must jointly explain why so much of this seemingly helpful (or harmful) organizational form exists purely for random reasons.

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Figure 1: State-Level Unionization Across States

Figure 1-A shows the state-level unionization rates for all states in the United States from 1929 to 2013. Figure 1-B shows the ranks of the state-level unionization rate for all states in the United States from 1929 to 2013. Figure 1-C shows the standard deviation of the *change* in ranks of the state-level unionization rates for all states in the United States from 1929 to 2013.

Figure 1-A

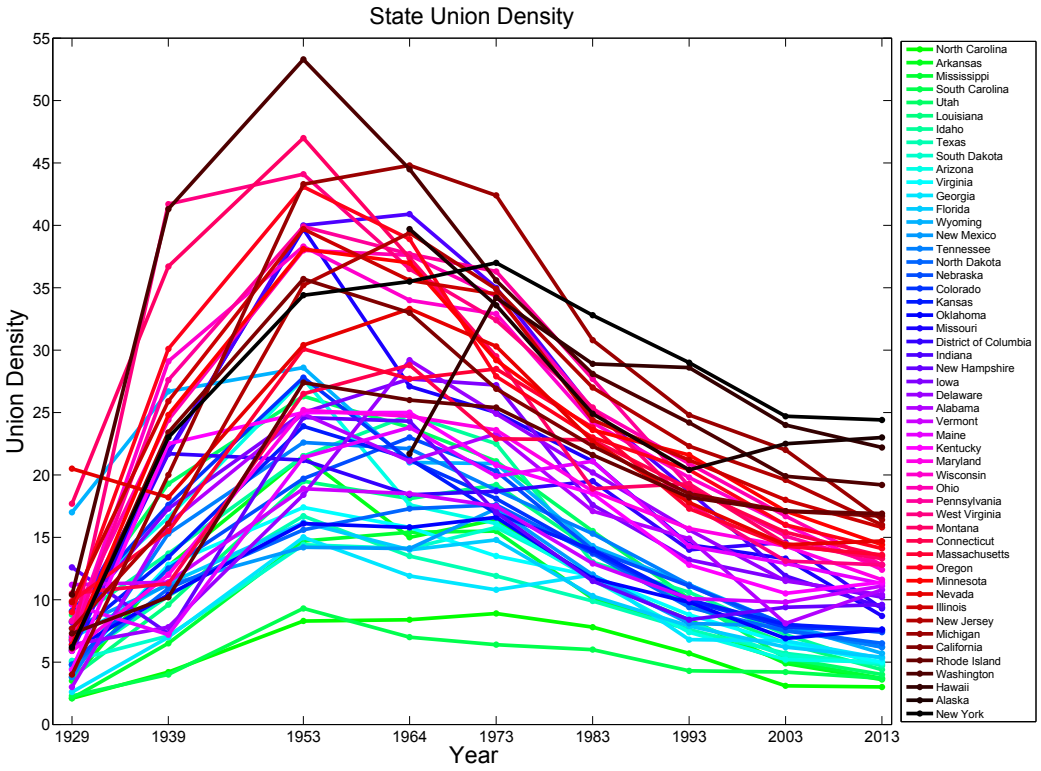


Figure 1-B

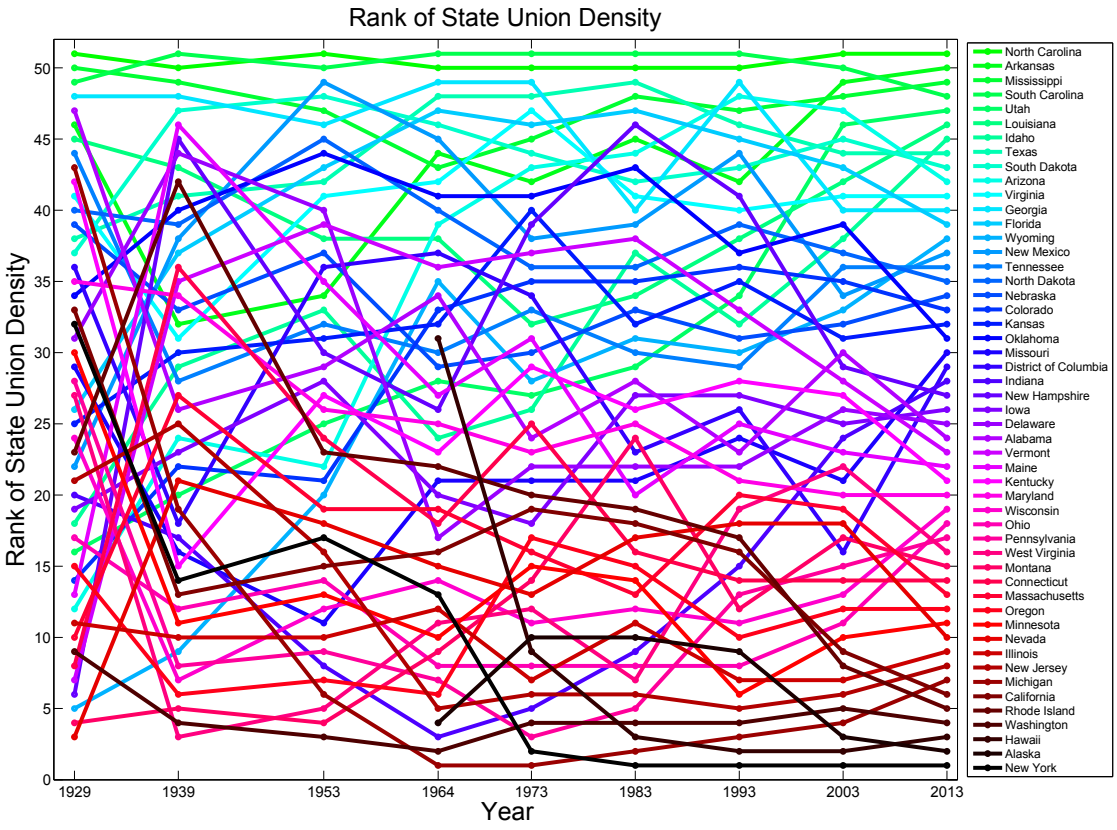


Figure 1-C

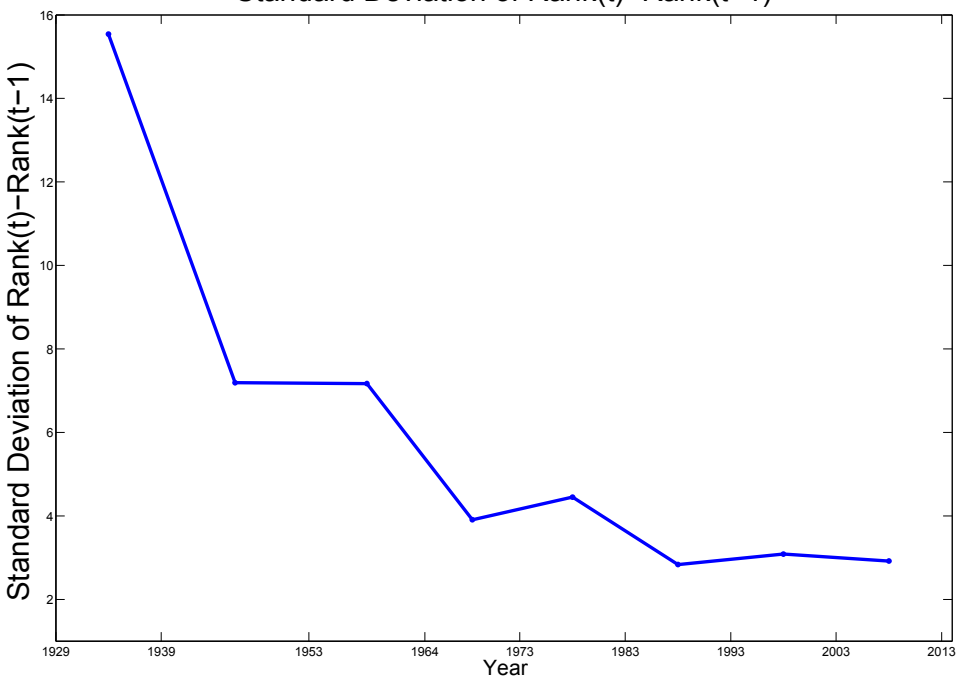


Figure 2: Rainfall and Drought Data

Figure 2-A shows the climate-division-level Palmer Drought Severity Index for October of the even years in the 1930s. Figure 2-B shows the state-level annual-average Palmer Drought severity Index for all the years in the 1930s. Figure 2-C shows the state-level annual-average Precipitation for all the years in the 1930s. Figure 2-D shows the national-level annual-average Palmer Drought Severity Index, Precipitation and Temperature in the United States from 1921 to 1950.

Figure 2-A

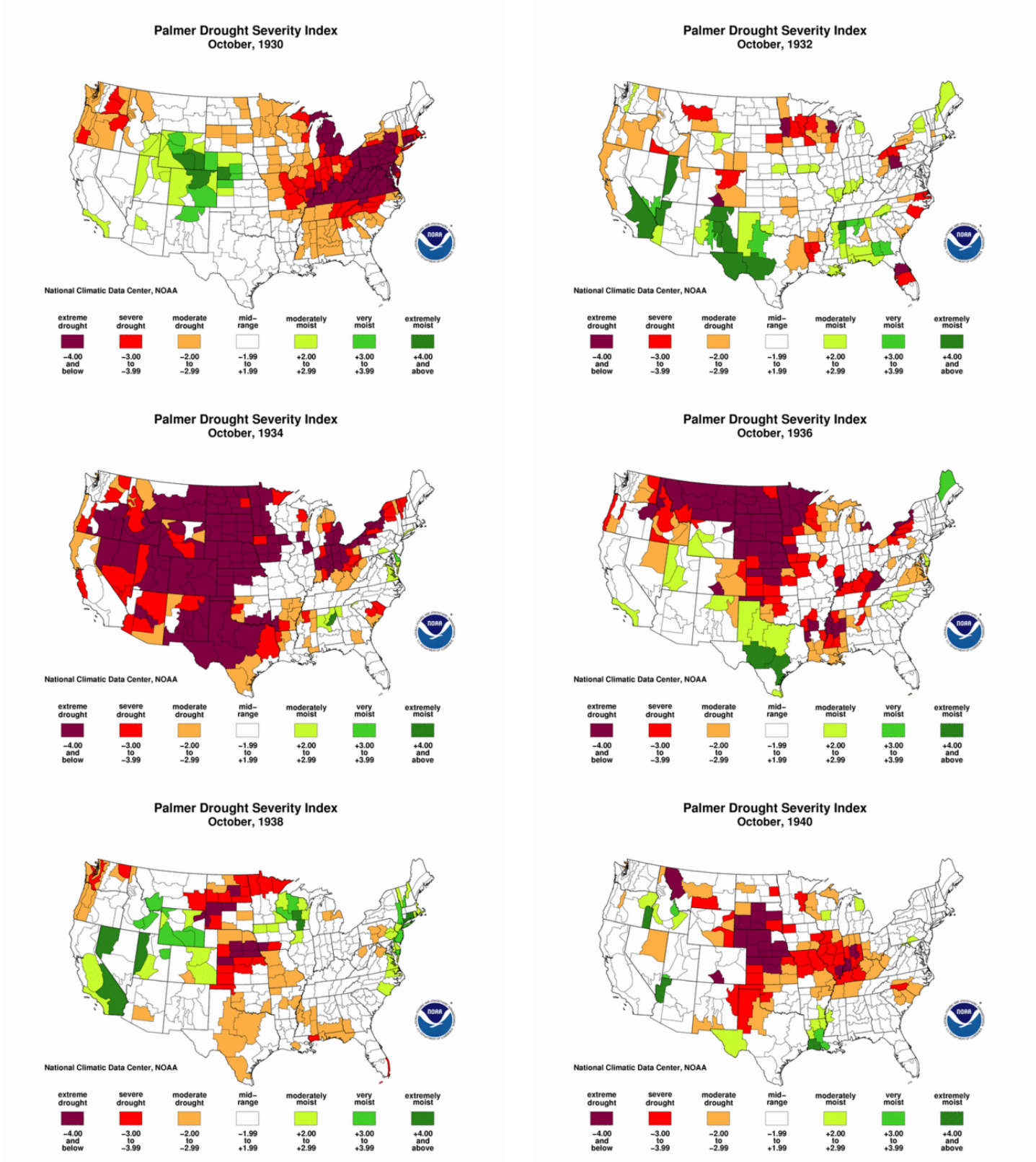


Figure 2-B

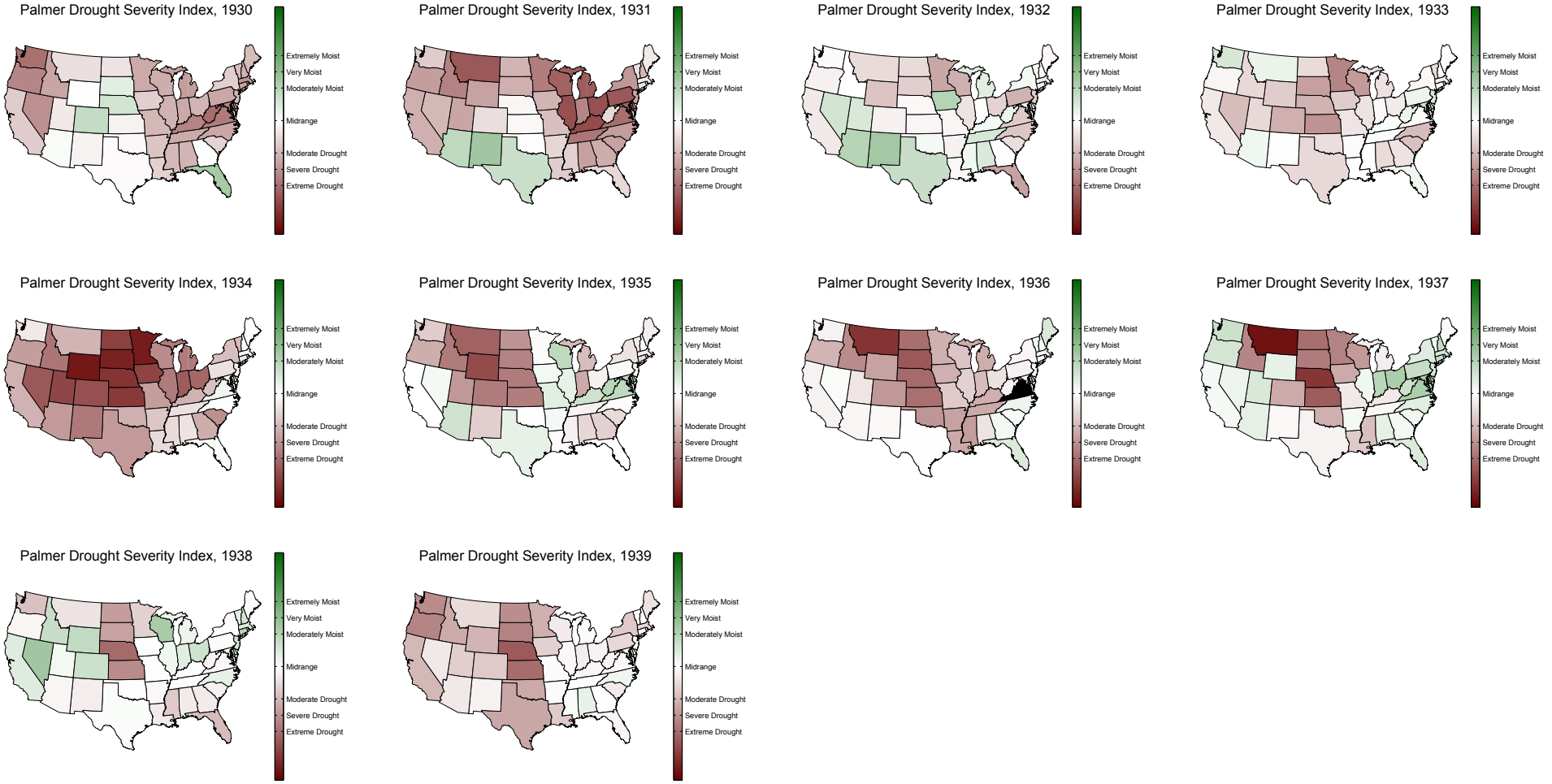

Palmer Drought Severity Index, 1930
Palmer Drought Severity Index, 1931
Palmer Drought Severity Index, 1932
Palmer Drought Severity Index, 1933
Palmer Drought Severity Index, 1934
Palmer Drought Severity Index, 1935
Palmer Drought Severity Index, 1936
Palmer Drought Severity Index, 1937
Palmer Drought Severity Index, 1938
Palmer Drought Severity Index, 1939
Extremely Moist
Very Moist
Moderately Moist
Midrange
Moderate Drought
Severe Drought
Extreme Drought

Figure 2-C

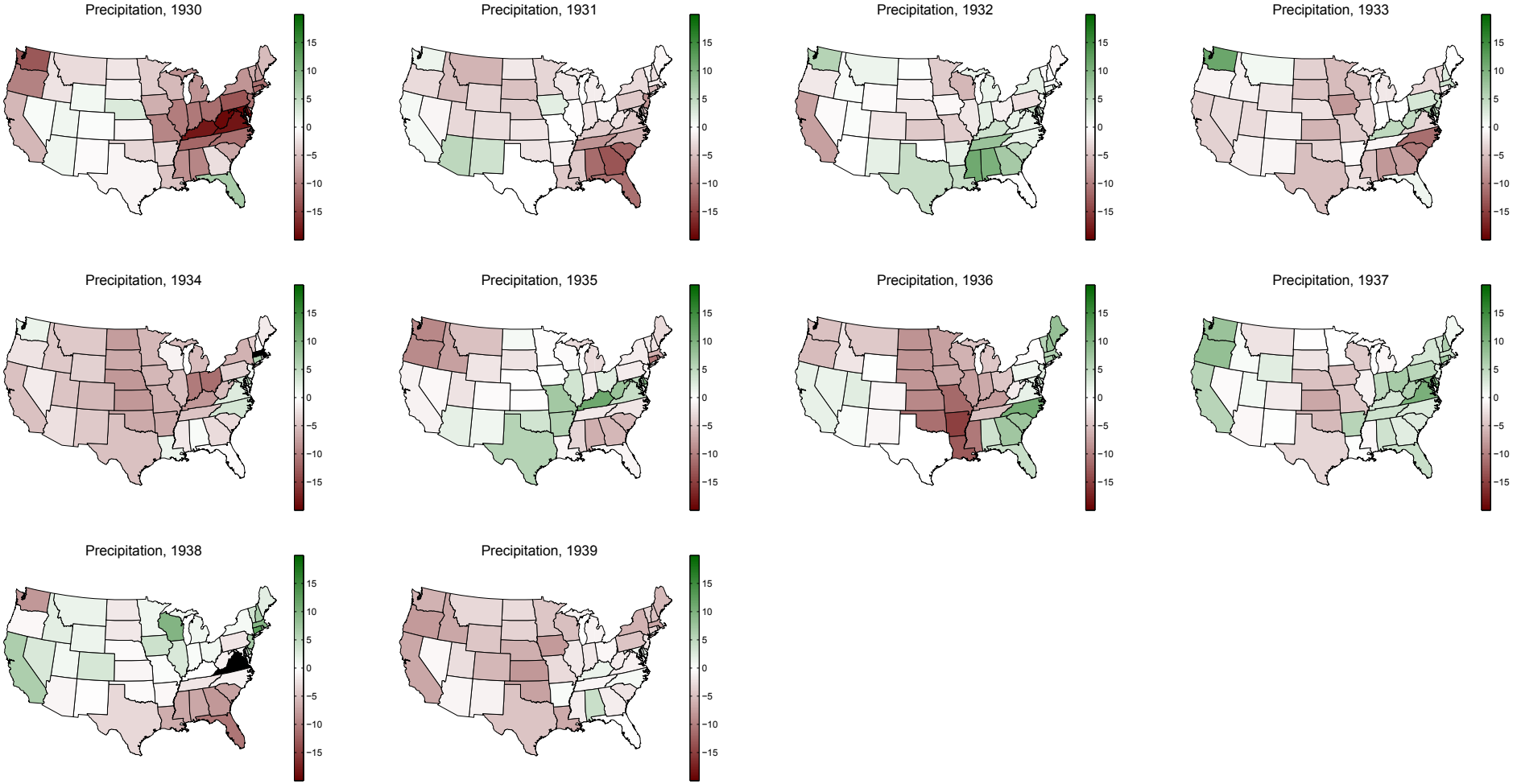

Precipitation, 1930
Precipitation, 1931
Precipitation, 1932
Precipitation, 1933
Precipitation, 1934
Precipitation, 1935
Precipitation, 1936
Precipitation, 1937
Precipitation, 1938
Precipitation, 1939
15
10
5
0
−5
−10
−15

Figure 2-D

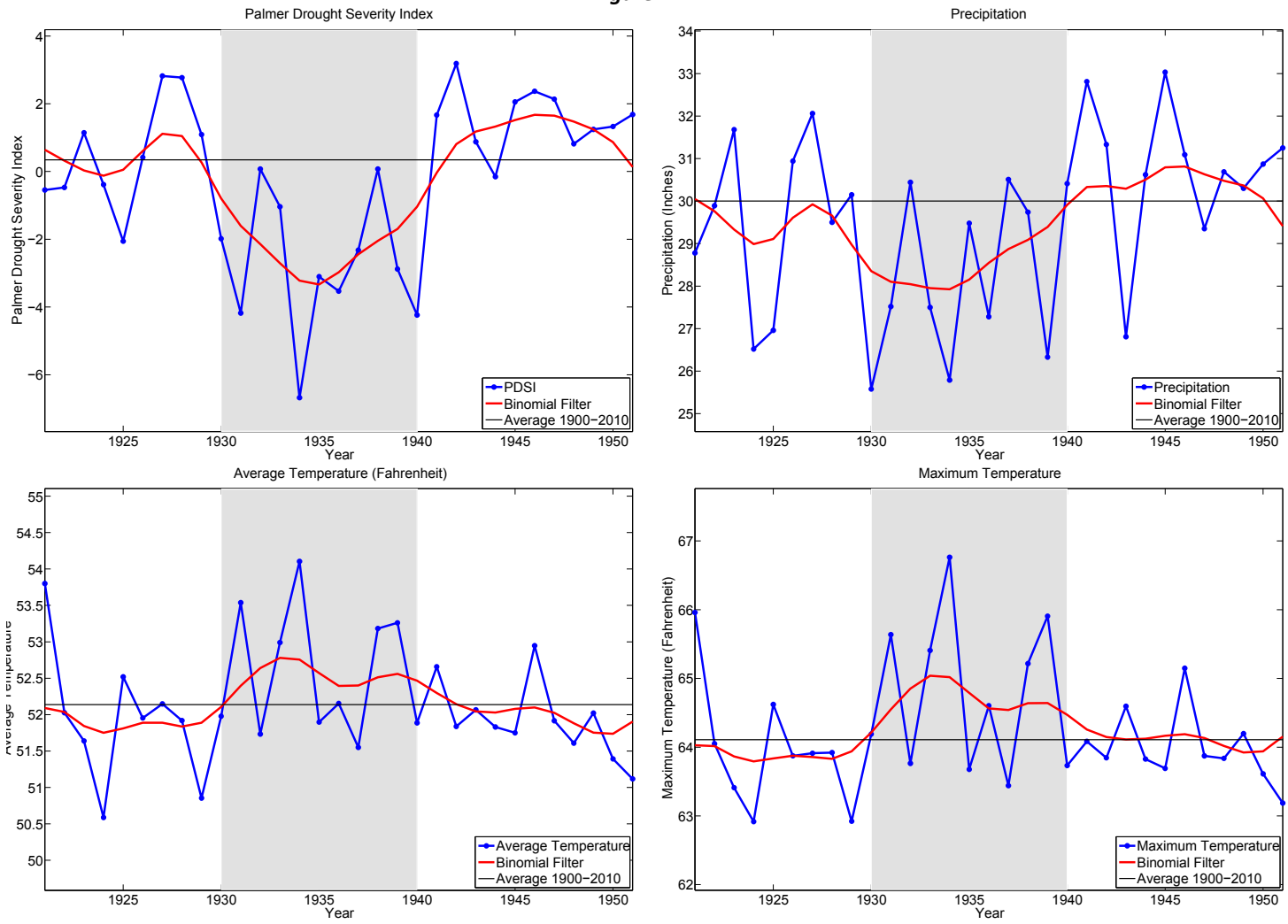

Palmer Drought Severity Index
Palmer Drought Severity Index
Year
PDSI
Binomial Filter
Average 1900−2010
Precipitation
Precipitation (Inches)
Year
Precipitation
Binomial Filter
Average 1900−2010
Average Temperature (Fahrenheit)
Year
Average Temperature
Binomial Filter
Average 1900−2010
Maximum Temperature
Maximum Temperature (Fahrenheit)
Year
Maximum Temperature
Binomial Filter
Average 1900−2010

Table I: Summary Statistics

This table reports the summary statistics for the sample. Variables in panels A-1, A-2 and A-3 are at the state-level and variables in panel B-1, B-2 and B-3 are at the MSA-level. Panel A-1 and B-1 report the summary statistics of state-level and MSA-level unionization rate, respectively. Panel A-2 reports the correlation coefficients for Rain_d and the state-level unionization rates from 1929 to 2013. Panel B-2 shows the correlation for Rain_d and the MSA-level unionization rate for 1986, 1993, 2003, and 2013. Panel A-3 and B-3 report the summary statistics of the main variable of interest. Rain_d is the average abnormal rain (Standardized Precipitation Index or SPI) over the drought years 1930, 1934 and 1936. Rain_nd is the average abnormal rain (Standardized Precipitation Index or SPI) over the non-drought years 1931, 1932, 1933, 1935 and 1937. Drought_d, Drought_nd are the average Palmer Drought Severity Indices over the drought years and non-drought years, respectively. Maxtemp_d, Maxtempt_nd, Avetemp_d and Avetempt_nd are the maximum and average temperatures over the drought years and non-drought years, respectively. State_unemployed_1930 and State_perc_manuf_1930 are the state-level unemployment rate and the state-level percentage of manufacturing in 1930. MSA_unemployed_1930 and MSA_perc_manuf_1930 are the msa-level unemployment rate and the msa-level percentage of manufacturing in 1930. InMigState_3540 and InMigState_5560 are the percentages in-migrants to the MSAs from the same state from 1935 to 1940 and 1955 to 1960, respectively.

Panel A-1

Union Rate (State)	Count	Mean	SD	Min	Max
1929	48	7.408	3.840	2.100	20.500
1939	48	17.033	9.065	4.000	41.700
1953	48	27.179	10.716	8.300	53.300
1964	48	25.525	9.843	7.000	44.800
1973	48	23.219	8.338	6.400	42.400
1983	48	17.973	6.524	6.000	32.800
1993	48	14.017	5.880	4.300	29.000
2003	48	11.210	5.261	3.100	24.700
2013	48	9.927	4.891	3.000	24.400

Panel A-2

			Union Rate								
		Rain_d	1929	1939	1953	1964	1973	1983	1993	2003	2013
Union Rate	Rain_d	1									
	1929	0.164	1.000								
	1939	-0.371	0.394	1.000							
	1953	-0.307	0.416	0.894	1.000						
	1964	-0.295	0.382	0.756	0.920	1.000					
	1973	-0.304	0.317	0.713	0.869	0.955	1.000				
	1983	-0.216	0.246	0.652	0.831	0.923	0.949	1.000			
	1993	-0.218	0.281	0.663	0.836	0.925	0.937	0.968	1.000		
	2003	-0.167	0.288	0.577	0.783	0.875	0.883	0.937	0.964	1.000	
	2013	-0.099	0.317	0.556	0.724	0.812	0.815	0.886	0.927	0.959	1.000

Panel A-3

	Count	Mean	SD	Min	Max
Rain_d	48	-0.628	0.477	-1.513	0.672
Rain_nd	48	-0.282	0.370	-1.179	0.559
Drought_d	48	-1.761	1.045	-3.599	1.146
Drought_nd	48	-0.822	0.961	-3.187	1.203
Maxtemp_d	48	0.013	0.013	-0.013	0.038
Maxtemp_nd	48	0.006	0.007	-0.011	0.020
Avetemp_d	48	0.007	0.013	-0.018	0.027
Avetemp_nd	48	0.007	0.010	-0.017	0.018
State_unemployed_1930	48	5.401	1.987	1.789	10.839
State_perc_manuf_1930	48	0.143	0.089	0.016	0.378
State_pop_1930	48	2553896	2537576	92000	1.26x10^7

Panel B-1

Union Rate (MSA)	Count	Mean	SD	Min	Max
1986	202	13.724	7.338	0.000	39.400
1993	202	11.000	5.942	0.000	28.300
2003	176	8.071	4.963	0.000	26.400
2013	173	6.936	5.275	0.000	27.700

Panel B-2

			Union Rate			
		Rain_d	1986	1993	2003	2013
Union Rate	Rain_d	1.000				
	1986	-0.496	1.000			
	1993	-0.510	0.860	1.000		
	2003	-0.522	0.789	0.798	1.000	
	2013	-0.485	0.663	0.661	0.695	1.000

Panel B-3

Rain_d	200	-0.295	0.510	-1.321	0.837
Rain_nd	200	0.230	0.565	-1.418	1.572
MSA_unemployed_1930	200	0.045	0.018	0.007	0.106
MSA_perc_manuf_1930	200	0.074	0.049	0.004	0.204
MSA_pop_1940	200	426675	1108839	12900	13.1x10^6
lnMigState_3540	69	0.057	0.032	0.006	0.156
lnMigState_5560	69	0.138	0.049	0.037	0.286

Table II: Unionization from 1929 to 2003 and Unionization in 2013

Panel A of this table reports regressions of state-level unionization rate in 2013 on state-level unionization rate from 1929 to 2003. The dependent variable is UnionRate_2013. Panel B reports regressions of the rank of unionization rate in 2013 on the rank of unionization rate from 1929 to 2003. The dependent variable is Rank_UnionRate_2013. Control variables include state-level unemployment rate, percentage of manufacturing in 1930, and state-level unemployment rate and population in 2010. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				UnionRate_2013				
UnionRate_1929	0.234							
	(1.049)							
UnionRate_1939		0.240***						
		(4.809)						
UnionRate_1953			0.225***					
			(4.533)					
UnionRate_1964				0.314***				
				(5.803)				
UnionRate_1973					0.334***			
					(5.685)			
UnionRate_1983						0.509***		
						(7.039)		
UnionRate_1993							0.635***	
							(9.467)	
UnionRate_2003								0.847***
								(11.531)
State_unemployed_1930	0.384	-0.101	-0.110	0.119	0.010	0.091	0.086	0.040
	(0.767)	(-0.249)	(-0.263)	(0.329)	(0.028)	(0.277)	(0.318)	(0.172)
State_perc_manuf_1930	-10.993	-3.881	-7.013	-8.342	-7.302	-7.568	-4.230	-5.388
	(-1.039)	(-0.473)	(-0.842)	(-1.110)	(-0.962)	(-1.114)	(-0.751)	(-1.110)
LawProtectUnion	-0.287	-0.017	-0.365	-1.028	-0.822	-0.816	-0.757	-0.376
	(-0.275)	(-0.021)	(-0.441)	(-1.369)	(-1.089)	(-1.208)	(-1.356)	(-0.781)
State_perc_Black_1929	-0.106	-0.079	-0.086	-0.043	-0.061	-0.017	-0.055	-0.028
	(-1.195)	(-1.153)	(-1.231)	(-0.679)	(-0.958)	(-0.297)	(-1.160)	(-0.698)
State_perc_Forb_1929	0.370***	0.449***	0.395***	0.338***	0.330***	0.263***	0.175***	0.094
	(3.402)	(5.084)	(4.445)	(4.223)	(4.080)	(3.573)	(2.781)	(1.655)
State_perc_Illit_1929	-0.134	-0.014	0.067	0.159	0.039	-0.003	0.119	0.099
	(-0.582)	(-0.080)	(0.356)	(0.920)	(0.233)	(-0.020)	(0.959)	(0.933)
NewDealRelief_19301939	-0.031**	-0.026***	-0.023***	-0.017**	-0.017**	-0.010	-0.009	-0.005
	(-2.273)	(-3.130)	(-2.816)	(-2.203)	(-2.290)	(-1.367)	(-1.508)	(-1.020)
State_unemployed	103.251**	89.940***	70.410**	37.342	60.505*	36.438	23.752	11.141
	(2.499)	(2.813)	(2.130)	(1.204)	(1.995)	(1.309)	(1.023)	(0.549)
State_pop	-0.000	-0.000	-0.000	0.000	-0.000	-0.000	0.000	-0.000
	(-0.154)	(-0.734)	(-0.355)	(0.188)	(-0.081)	(-0.084)	(0.103)	(-0.365)
Constant	3.137	0.936	0.919	-0.701	-1.099	-1.961	-0.625	0.189
	(1.121)	(0.413)	(0.396)	(-0.326)	(-0.501)	(-0.989)	(-0.396)	(0.141)
R-Squared	0.689	0.803	0.794	0.832	0.829	0.863	0.906	0.930
Observations	48	48	48	48	48	48	48	48

Panel B

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Rank_UnionRate_2013				
Rank_UnionRate_1929	0.023							
	(0.121)							
Rank_UnionRate_1939		0.435***						
		(4.294)						
Rank_UnionRate_1953			0.468***					
			(3.976)					
Rank_UnionRate_1964				0.621***				
				(5.728)				
Rank_UnionRate_1973					0.525***			
					(5.414)			
Rank_UnionRate_1983						0.580***		
						(5.867)		
Rank_UnionRate_1993							0.689***	
							(7.836)	
Rank_UnionRate_2003								0.900***
								(13.036)
State_unemployed_1930	2.003	0.512	0.194	1.106	0.706	0.792	0.751	0.577
	(1.326)	(0.410)	(0.148)	(1.026)	(0.629)	(0.736)	(0.822)	(0.916)
State_perc_manuf_1930	-21.602	-10.114	-21.371	-29.220	-21.396	-20.584	-14.992	-22.416*
	(-0.636)	(-0.398)	(-0.824)	(-1.293)	(-0.925)	(-0.923)	(-0.789)	(-1.712)
LawProtectUnion	-2.008	-1.910	-2.197	-4.088*	-3.160	-3.193	-3.048	-1.259
	(-0.644)	(-0.761)	(-0.854)	(-1.805)	(-1.371)	(-1.438)	(-1.614)	(-0.968)
State_perc_Black_1929	-0.316	-0.263	-0.325	-0.146	-0.246	-0.132	-0.232	-0.061
	(-1.220)	(-1.243)	(-1.502)	(-0.764)	(-1.271)	(-0.698)	(-1.456)	(-0.553)
State_perc_Forb_1929	0.921***	1.183***	1.022***	0.858***	0.814***	0.745***	0.546**	0.300**
	(2.776)	(4.286)	(3.692)	(3.578)	(3.300)	(3.119)	(2.633)	(2.043)
State_perc_Illit_1929	-0.685	-0.088	0.047	0.392	-0.000	-0.134	0.413	0.180
	(-1.016)	(-0.158)	(0.080)	(0.760)	(-0.000)	(-0.278)	(0.965)	(0.627)
NewDealRelief_19301939	-0.063	-0.075***	-0.070**	-0.044*	-0.050**	-0.031	-0.029	-0.018
	(-1.592)	(-2.961)	(-2.699)	(-1.923)	(-2.159)	(-1.357)	(-1.494)	(-1.302)
State_unemployed	293.905**	271.853***	239.047**	111.472	202.969**	150.543	111.024	71.833
	(2.316)	(2.736)	(2.332)	(1.189)	(2.202)	(1.662)	(1.425)	(1.330)
State_pop	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.617)	(-1.457)	(-0.811)	(-0.027)	(-0.513)	(-0.355)	(-0.131)	(-1.173)
Constant	3.043	-1.313	3.684	-0.566	-0.310	-1.412	-1.660	-1.791
	(0.360)	(-0.188)	(0.520)	(-0.091)	(-0.049)	(-0.230)	(-0.318)	(-0.498)
R-Squared	0.695	0.796	0.786	0.838	0.829	0.842	0.885	0.945
Observations	48	48	48	48	48	48	48	48

Table III: Rainfall and Crop Predicts Unionization in 1939

This table reports regressions of the state-level unionization rates on various measures of weather condition in the drought years (1930, 1934 and 1936) of the 1930s. Panel A reports regressions of the state-level unionization rate in 1939 on Rain_d, Drought_d, Maxtemp_d and Avetemp_d. Panel B reports regressions of the unionization rates from 1939 to 2013 on Rain_d. Panel C reports regressions of the unionization rates from 1939 to 2013 on Drought_d. Rain_d is the state-level average Standardized Precipitation Index over the drought years 1930, 1934 and 1936. Drought_d is the state-level average Palmer Drought Severity Index over the drought years. Maxtemp_d is the state-level average of the maximum temperatures and Avetemp_d state-level is the average of the average temperatures over the drought years. State_unemploy_1930 and State_perf_manuf_1930 are the state-level unemployment rate and the state-level percentage of manufacturing in 1930. State_unemployed_*y* and State_pop_*y* are the state-level unemployment rate and the state-level population in year *y.* ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

Panel A

	(1)	(2)	(3)
		UnionRate_1939	
Rain_d	-6.195**		
	(-2.138)		
Drought_d		-3.587**	
		(-2.585)	
Maxtemp_d			260.314*
			(1.727)
UnionRate_1929	0.804	0.740	0.587
	(1.510)	(1.441)	(1.099)
State_unemployed_1930	1.650	1.694	1.519
	(1.388)	(1.461)	(1.256)
State_perc_manuf_1930	3.400	9.125	12.315
	(0.140)	(0.380)	(0.465)
LawProtectUnion	-3.761	-4.725*	-3.202
	(-1.506)	(-1.886)	(-1.271)
State_perc_Black_1929	0.148	0.167	0.167
	(0.681)	(0.785)	(0.746)
State_perc_Forb_1929	-0.420*	-0.299	-0.205
	(-1.705)	(-1.234)	(-0.751)
State_perc_Illit_1929	-0.597	-0.568	-0.585
	(-1.011)	(-0.991)	(-0.952)
NewDealRelief_19301939	0.016	0.010	0.010
	(0.536)	(0.339)	(0.315)
State_unemployed	69.699	72.036	69.081
	(1.095)	(1.160)	(1.063)
State_pop	0.000**	0.000**	0.000*
	(2.231)	(2.305)	(1.771)
Constant	-11.241	-14.404	-10.482
	(-1.041)	(-1.337)	(-0.931)
R-Squared	0.521	0.545	0.502
Observations	48	48	48

Panel B

		(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Union Rate			
	1939	1953	1964	1973	1983	1993	2003	2013
Rain_d	-6.194**	-8.824***	-7.424**	-7.271***	-4.616**	-4.972***	-3.183**	-1.598
	(-2.135)	(-2.724)	(-2.510)	(-3.337)	(-2.493)	(-2.965)	(-2.432)	(-1.191)
UnionRate_1929	0.794	0.554	0.217	0.163	0.103	0.210	0.102	0.302
	(1.492)	(1.059)	(0.352)	(0.414)	(0.310)	(0.726)	(0.455)	(1.320)
State_unemployed_1930	1.683	2.937**	0.547	1.969**	1.091	1.309*	0.614	0.391
	(1.418)	(2.580)	(0.516)	(2.340)	(1.658)	(1.922)	(1.296)	(0.785)
State_perc_manuf_1930	3.095	22.820	44.059*	22.003	22.045	9.497	19.464*	-6.367
	(0.128)	(0.949)	(1.902)	(1.179)	(1.436)	(0.638)	(1.766)	(-0.568)
LawProtectUnion		(1)	-1.262	-1.683	-0.628	-0.699	-0.340	-0.566
	(-1.503)	(-1.060)	(-0.515)	(-0.902)	(-0.405)	(-0.511)	(-0.315)	(-0.534)
State_perc_Black_1929	0.147	0.141	0.041	0.073	-0.026	0.051	-0.004	-0.096
	(0.676)	(0.753)	(0.208)	(0.522)	(-0.222)	(0.494)	(-0.051)	(-1.080)
State_perc_Forb_1929	-0.421*	-0.353	-0.083	-0.109	0.029	0.123	0.186*	0.342***
	(-1.705)	(-1.402)	(-0.315)	(-0.589)	(0.190)	(0.901)	(1.770)	(3.091)
State_perc_Illit_1929	-0.595	-0.626	-0.997*	-0.228	-0.088	0.031	-0.292	-0.033
	(-1.006)	(-1.100)	(-1.811)	(-0.549)	(-0.253)	(0.082)	(-1.125)	(-0.136)
NewDealRelief_19301939	0.016	0.028	0.031	0.019	-0.001	-0.006	-0.007	-0.029**
	(0.535)	(0.921)	(1.026)	(0.884)	(-0.065)	(-0.383)	(-0.574)	(-2.156)
State_pop	0.000**	0.000**	0.000*	0.000**	0.000	0.000*	0.000	0.000
	(2.208)	(2.141)	(1.775)	(2.179)	(0.337)	(1.808)	(1.486)	(0.329)
State_unemployed	68.595	-0.624	13.960	-68.404	0.000	-55.258	127.395**	96.271**
	(1.076)	(-0.010)	(0.295)	(-1.453)	(0.189)	(-0.804)	(2.136)	(2.317)
Constant	-11.085	-4.111	6.737	4.297	4.470	3.514	-5.196	0.760
	(-1.026)	(-0.525)	(0.865)	(0.702)	(0.892)	(0.632)	(-1.255)	(0.222)
R-Squared	0.520	0.650	0.707	0.693	0.656	0.661	0.744	0.701
Observations	48	48	41	48	48	48	48	48

Panel C

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Union Rate			
	1939	1953	1964	1973	1983	1993	2003	2013
Drought_d	-3.586**	-4.344***	-4.082***	-3.481***	-2.128**	-2.388***	-1.540**	-0.910
	(-2.581)	(-2.850)	(-2.954)	(-3.246)	(-2.272)	(-2.859)	(-2.376)	(-1.391)
UnionRate_1929	0.730	0.429	0.204	0.044	0.019	0.135	0.054	0.289
	(1.422)	(0.839)	(0.346)	(0.112)	(0.058)	(0.474)	(0.247)	(1.291)
State_unemployed_1930	1.727	3.060**	0.572	2.037**	1.107	1.336*	0.624	0.387
	(1.492)	(2.715)	(0.558)	(2.405)	(1.661)	(1.946)	(1.314)	(0.782)
State_perc_manuf_1930	8.818	27.152	49.696**	24.526	24.043	11.573	20.977*	-4.797
	(0.367)	(1.122)	(2.196)	(1.288)	(1.505)	(0.763)	(1.863)	(-0.422)
LawProtectUnion	-4.722*	-3.972	-2.549	-2.479	-1.069	-1.209	-0.673	-0.809
	(-1.883)	(-1.491)	(-1.021)	(-1.279)	(-0.652)	(-0.845)	(-0.598)	(-0.739)
State_perc_Black_1929	0.166	0.154	0.089	0.083	-0.022	0.054	-0.002	-0.094
	(0.780)	(0.825)	(0.454)	(0.587)	(-0.189)	(0.522)	(-0.019)	(-1.073)
State_perc_Forb_1929	-0.300	-0.193	0.048	0.018	0.105	0.208	0.241**	0.372***
	(-1.235)	(-0.777)	(0.182)	(0.100)	(0.685)	(1.534)	(2.314)	(3.456)
State_perc_Illit_1929	-0.566	-0.630	-1.004*	-0.257	-0.125	0.015	-0.305	-0.025
	(-0.987)	(-1.119)	(-1.894)	(-0.616)	(-0.360)	(0.040)	(-1.177)	(-0.104)
NewDealRelief_19301939	0.010	0.022	0.029	0.014	-0.004	-0.010	-0.009	-0.031**
	(0.339)	(0.735)	(0.986)	(0.631)	(-0.222)	(-0.631)	(-0.779)	(-2.296)
State_pop	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**	0.000**
	(2.282)	(2.175)	(2.175)	(2.175)	(2.175)	(2.175)	(2.175)	(2.175)
State_unemployed	70.924	-13.728	-13.728	-13.728	-13.728	-13.728	-13.728	-13.728
	(1.140)	(-0.225)	(-0.225)	(-0.225)	(-0.225)	(-0.225)	(-0.225)	(-0.225)
Constant	-14.247	-5.750	4.162	3.712	4.096	3.039	-5.605	0.029
	(-1.322)	(-0.718)	(0.538)	(0.587)	(0.765)	(0.535)	(-1.319)	(0.008)
R-Squared	0.544	0.656	0.726	0.689	0.648	0.656	0.743	0.705
Observations	48	48	41	48	48	48	48	48

Table IV: Placebo Test on Non-Drought Years

This table reports regressions of the state-level unionization rates on various measures of weather condition in the *non*-drought years (1931, 1932, 1933, 1935 and 1937) of the 1930s. Panel A reports regressions of the state-level unionization rate in 1939 on Rain_nd, Drought_nd, Maxtemp_nd and Avetemp_nd. Panel B reports regressions of the unionization rates from 1939 to 2013 on Rain_nd. Panel C reports regressions of the unionization rates from 1939 to 2013 on Drought_nd. Rain_nd is the state-level average Standardized Precipitation Index over the non-drought years. Drought_nd is the state-level average Palmer Drought Severity Index over the non-drought years. Maxtemp_nd is the state-level average of the maximum temperatures and Avetemp_nd is the state-level average of the annual-average temperatures over the non-drought years. State_unemploy_1930 and State_perf_manuf_1930 are the state-level unemployment rate and the state-level percentage of manufacturing in 1930. State_unemployed_*y* and State_pop_*y* are the state-level unemployment rate and the state-level population in year *y*. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

Panel A

	(1)	(2)	(3)
		UnionRate_1939	
Rain_nd	-2.145		
	(-0.485)		
Drought_nd		-0.588	
		(-0.386)	
Maxtemp_nd			-108.319
			(-0.471)
UnionRate_1929	0.622	0.610	0.625
	(1.118)	(1.099)	(1.122)
State_unemployed_1930	1.465	1.489	1.211
	(1.165)	(1.173)	(0.915)
State_perc_manuf_1930	-2.286	-3.847	-4.521
	(-0.087)	(-0.149)	(-0.178)
LawProtectUnion	-3.388	-3.163	-2.889
	(-1.205)	(-1.166)	(-1.109)
State_perc_Black_1929	0.055	0.066	0.090
	(0.228)	(0.275)	(0.395)
State_perc_Forb_1929	-0.431	-0.409	-0.401
	(-1.582)	(-1.547)	(-1.535)
State_perc_Illit_1929	-0.754	-0.812	-0.984
	(-1.063)	(-1.189)	(-1.609)
NewDealRelief_19301939	0.018	0.017	0.012
	(0.569)	(0.540)	(0.382)
State_unemployed	59.908	61.991	63.652
	(0.881)	(0.915)	(0.945)
State_pop	0.000**	0.000**	0.000**
	(2.288)	(2.265)	(2.274)
Constant	-2.513	-2.414	1.175
	(-0.238)	(-0.227)	(0.099)
R-Squared	0.464	0.463	0.464
Observations	48	48	48

Panel B

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Union Rate			
	1939	1953	1964	1973	1983	1993	2003	2013
Rain_nd	-2.128	0.113	-0.850	-0.344	1.246	-0.587	-0.370	0.402
	(-0.481)	(0.023)	(-0.144)	(-0.097)	(0.442)	(-0.225)	(-0.188)	(0.215)
UnionRate_1929	0.611	0.271	-0.086	-0.153	-0.062	-0.015	-0.043	0.227
	(1.100)	(0.478)	(-0.123)	(-0.347)	(-0.176)	(-0.047)	(-0.181)	(0.990)
State_unemployed_1930	1.500	3.163**	0.506	2.016**	1.048	1.168	0.617	0.390
	(1.195)	(2.520)	(0.428)	(2.092)	(1.476)	(1.538)	(1.206)	(0.766)
State_perc_manuf_1930	-2.628	7.200	39.331	6.307	7.880	2.499	13.277	-11.876
	(-0.100)	(0.263)	(1.439)	(0.288)	(0.462)	(0.144)	(1.083)	(-1.035)
LawProtectUnion	-3.383	-2.618	0.252	-0.708	0.630	0.076	0.175	-0.193
	(-1.201)	(-0.862)	(0.077)	(-0.310)	(0.354)	(0.047)	(0.142)	(-0.168)
State_perc_Black_1929	0.054	0.105	-0.096	0.040	-0.038	0.028	-0.022	-0.099
	(0.224)	(0.483)	(-0.439)	(0.241)	(-0.290)	(0.229)	(-0.243)	(-1.051)
State_perc_Forb_1929	-0.432	-0.246	-0.165	-0.032	0.120	0.183	0.223*	0.378***
	(-1.581)	(-0.846)	(-0.547)	(-0.146)	(0.694)	(1.159)	(1.880)	(3.263)
State_perc_Illit_1929	-0.753	-0.983	-1.202*	-0.602	-0.427	-0.325	-0.478	-0.166
	(-1.061)	(-1.410)	(-1.741)	(-1.123)	(-1.015)	(-0.726)	(-1.555)	(-0.597)
NewDealRelief_19301939	0.018	0.036	0.032	0.019	-0.007	-0.006	-0.008	-0.031**
	(0.569)	(1.096)	(0.945)	(0.770)	(-0.329)	(-0.354)	(-0.622)	(-2.247)
State_pop	0.000**	0.000*	0.000	0.000	-0.000	0.000	0.000	-0.000
	(2.268)	(1.862)	(1.515)	(1.387)	(-0.382)	(0.918)	(0.656)	(-0.204)
State_unemployed_	58.734	-76.004	-0.185	-92.849*	0.000	-21.821	142.074**	103.256**
	(0.863)	(-1.153)	(-0.004)	(-1.745)	(0.738)	(-0.288)	(2.220)	(2.464)
Constant	-2.341	8.532	17.253**	16.321**	13.294***	8.995	-1.092	3.420
	(-0.222)	(1.108)	(2.133)	(2.641)	(2.811)	(1.467)	(-0.257)	(1.087)
R-Squared	0.463	0.578	0.644	0.598	0.599	0.578	0.703	0.689
Observations	48	48	41	48	48	48	48	48

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Union Rate			
	1939	1953	1964	1973	1983	1993	2003	2013
Drought_nd	-0.585	0.214	0.157	-0.051	0.631	-0.075	-0.050	0.288
	(-0.384)	(0.127)	(0.082)	(-0.042)	(0.645)	(-0.084)	(-0.074)	(0.444)
UnionRate_1929	0.600	0.267	-0.138	-0.158	-0.055	-0.023	-0.048	0.221
	(1.080)	(0.473)	(-0.198)	(-0.360)	(-0.157)	(-0.075)	(-0.205)	(0.973)
State_unemployed_1930	1.523	3.163**	0.533	2.022**	1.001	1.183	0.623	0.381
	(1.202)	(2.536)	(0.456)	(2.096)	(1.411)	(1.559)	(1.219)	(0.754)
State_perc_manuf_1930	-4.167	6.546	37.458	5.819	7.481	1.501	12.729	-12.323
	(-0.162)	(0.246)	(1.445)	(0.273)	(0.452)	(0.089)	(1.058)	(-1.109)
LawProtectUnion	-3.160	-2.571	0.675	-0.648	0.666	0.181	0.241	-0.145
	(-1.163)	(-0.871)	(0.224)	(-0.295)	(0.389)	(0.116)	(0.205)	(-0.132)
State_perc_Black_1929	0.065	0.113	-0.085	0.044	-0.031	0.033	-0.019	-0.092
	(0.271)	(0.519)	(-0.396)	(0.260)	(-0.245)	(0.278)	(-0.204)	(-0.976)
State_perc_Forb_1929	-0.409	-0.240	-0.151	-0.027	0.118	0.192	0.228*	0.380***
	(-1.547)	(-0.858)	(-0.519)	(-0.127)	(0.710)	(1.256)	(1.991)	(3.392)
State_perc_Illit_1929	-0.810	-1.012	-1.273*	-0.620	-0.450	-0.355	-0.498*	-0.192
	(-1.185)	(-1.501)	(-1.952)	(-1.198)	(-1.116)	(-0.804)	(-1.695)	(-0.716)
NewDealRelief_19301939	0.017	0.036	0.031	0.019	-0.007	-0.006	-0.008	-0.031**
	(0.540)	(1.104)	(0.932)	(0.766)	(-0.326)	(-0.364)	(-0.629)	(-2.222)
State_pop	0.000**	0.000*	0.000	0.000	-0.000	0.000	0.000	-0.000
	(2.246)	(1.863)	(1.486)	(1.384)	(-0.455)	(0.882)	(0.626)	(-0.259)
State_unemployed	60.811	-78.205	0.918	-92.855*	0.000	-22.527	142.565**	102.290**
	(0.897)	(-1.179)	(0.018)	(-1.744)	(0.803)	(-0.298)	(2.219)	(2.442)
Constant	-2.247	8.872	18.134**	16.465**	13.789***	9.302	-0.953	3.751
	(-0.211)	(1.156)	(2.244)	(2.665)	(2.898)	(1.533)	(-0.219)	(1.187)
R-Squared	0.462	0.578	0.644	0.598	0.602	0.578	0.702	0.691
Observations	48	48	41.000	48	48	48	48	48

Table V: Exogenous Unionization in 1939 Predicts Unionization Today

This table reports the regression of unionization rate in 2013 on the instrumented unionization rate in 1939, where the unionization rate in 1939 is instrumented by Rain_d. Rain_d is the state-level average Standardized Precipitation Index over the drought years (1930, 1934, and 1936). Control variables include: UnionRate_1929 is the unionization rate in 1929; State_unemploy_1930 and State_perf_manuf_1930 are the state-level unemployment rate and the state-level percentage of manufacturing in 1930; State_unemployed_*y* and State_pop_*y,* are the state-level unemployment rate and the state-level population in year *y.* ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)
			Union Rate		
	1939	2003	2003	2013	2013
Rain_d	-6.195**				
	(-2.138)				
UnionRate_1939		0.240***		0.236***	
		(4.068)		(4.695)	
IV UnionRate_1939			0.331**		0.317**
			(2.609)		(2.659)
UnionRate_1929	0.804	-0.126	-0.133	0.159	0.179
	(1.510)	(-0.651)	(-0.618)	(0.889)	(0.862)
State_unemployed_1930	1.650	0.225	-0.213	-0.182	-0.561
	(1.388)	(0.519)	(-0.375)	(-0.436)	(-0.960)
State_perc_manuf_1930	3.400	12.320	18.735*	-5.857	-4.171
	(0.140)	(1.296)	(1.735)	(-0.688)	(-0.411)
LawProtectUnion	-3.761	0.452	0.782	0.135	0.273
	(-1.506)	(0.482)	(0.739)	(0.162)	(0.277)
State_perc_Black_1929	0.148	0.008	-0.008	-0.095	-0.116
	(0.681)	(0.111)	(-0.104)	(-1.340)	(-1.418)
State_perc_Forb_1929	-0.420*	0.324***	0.342***	0.449***	0.481***
	(-1.705)	(3.393)	(3.070)	(5.071)	(4.410)
State_perc_Illit_1929	-0.597	-0.225	-0.236	0.038	0.092
	(-1.011)	(-0.985)	(-0.896)	(0.201)	(0.400)
NewDealRelief_19301939	0.016	-0.010	-0.010	-0.032***	-0.035***
	(0.536)	(-0.885)	(-0.858)	(-2.938)	(-2.744)
State_pop	0.000**	0.000	0.000	-0.000	-0.000
	(2.231)	(0.440)	(0.425)	(-0.615)	(-0.470)
State_unemployed	69.699	65.315	120.198*	97.000***	116.211***
	(1.095)	(1.161)	(2.027)	(2.936)	(3.009)
Constant	-11.241	0.423	-3.022	1.069	-0.265
	(-1.041)	(0.126)	(-0.798)	(0.469)	(-0.092)
R-Squared	0.521	0.796	0.750	0.807	0.740
Observations	48	48	48	48	48

Table VI: Rainfall and Drought Predict Union Strike Activities

This table reports regressions of the state-level union strike activities from 1937 to 1939 on various measures of weather condition in the drought years (1930, 1934 and 1936) and non-drought years (1931, 1932, 1933, 1935 and 1937) of the 1930s. Workers involved in strikes is the total number of workers that involved in strikes normalized by the state-level labor force. Rain_d and Rain_nd are the state-level average Standardized Precipitation Indices over the drought years and non-drought years, respectively. Drought_d and Drought_nd are the state-level average Palmer Drought Severity Indices over the drought years and non-drought years, respectively. State_unemploy_1930 and State_perf_manuf_1930 are the state-level unemployment rate and the state-level percentage of manufacturing in 1930. State_unemployed and State_pop are the state-level unemployment rate and the state-level population in 1940. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
	Workers involved in strikes from 1937-1939			
Rain_d	-0.010**			
	(-2.431)			
Drought_d		-0.005**		
		(-2.318)		
Rain_nd			-0.005	
			(-0.769)	
Drought_nd				-0.001
				(-0.371)
UnionRate_1929	-0.002***	-0.002***	-0.003***	-0.003***
	(-3.183)	(-3.201)	(-3.288)	(-3.272)
State_unemployed_1930	0.007***	0.007***	0.007***	0.007***
	(4.147)	(4.136)	(3.730)	(3.742)
State_perc_manuf_1930	0.029	0.033	0.022	0.016
	(0.856)	(0.958)	(0.600)	(0.443)
LawProtectUnion	-0.002	-0.003	-0.002	-0.001
	(-0.517)	(-0.798)	(-0.400)	(-0.197)
State_perc_Black_1929	0.000	0.000	-0.000	-0.000
	(0.191)	(0.224)	(-0.396)	(-0.245)
State_perc_Forb_1929	-0.000	0.000	-0.000	-0.000
	(-0.372)	(0.041)	(-0.521)	(-0.364)
State_perc_Illit_1929	-0.001	-0.001	-0.001	-0.001
	(-0.610)	(-0.653)	(-0.466)	(-0.721)
NewDealRelief_19301939	0.000	0.000	0.000	0.000
	(1.352)	(1.148)	(1.320)	(1.244)
State_unemployed	-0.175*	-0.175*	-0.191*	-0.187*
	(-1.997)	(-1.988)	(-2.020)	(-1.966)
State_pop	0.000	0.000	0.000	0.000
	(0.001)	(0.085)	(0.272)	(0.193)
Constant	-0.001	-0.003	0.011	0.012
	(-0.065)	(-0.177)	(0.766)	(0.834)
R-Squared	0.674	0.669	0.622	0.617
Observations	45	45	45	45

Table VII: Rain in the 1930s and Unionization Today

This table reports regressions of MSA-level unionization rate in 2013 on various measures of rain surrounding the MSA. Panel A reports regression of the MSA-level unionization rate in 2013 and Panel B reports regression of the MSA-level unionization rate in 1986, 1993, 2003 and 2013. Rain_1934 is the MSA-level average Standardized Precipitation Index inside the MSA in 1934. Rain_1934_10, Rain_1934_50, and Rain_1934_100 are the MSA-level average Standardized Precipitation Indices within the 10, 50, and 100 miles radius of the MSA. Rain_d is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936). Rain_nd is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the *non*-drought years (1931, 1932, 1933, 1935 and 1937). Control variables include: MSA_perf_manuf_1930 is the MSA-level percentage of manufacturing in 1930; MSA_unemployed_*y*, MSA_pop_*y*, MSA_perc_manuf_*y* and MSA_area_*y* are the MSA-level unemployment rate, the MSA-level population, the MSA-level percentage of manufacturing and the MSA-level area in year *y*. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Union Rate 2013				
Rain_1934_in	-1.650***				
	(-3.598)				
Rain_1934_50		-1.715***			
		(-3.439)			
Rain_1934_100			-1.961***		
			(-3.507)		
Rain_d				-4.527***	
				(-6.376)	
Rain_nd					-1.145
					(-0.940)
MSA_perc_manuf_1930	19.797***	19.689***	19.922***	16.422***	17.284***
	(4.284)	(4.248)	(4.300)	(3.816)	(3.443)
MSA_unemployed_2010	-10.558	-10.100	-9.548	-3.945	-7.052
	(-0.933)	(-0.891)	(-0.844)	(-0.376)	(-0.604)
MSA_pop_2010	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.646)	(-0.655)	(-0.653)	(-0.049)	(-0.939)
MSA_perc_manuf_2010	-16.531	-16.109	-16.856	-16.691	-6.979
	(-1.358)	(-1.319)	(-1.378)	(-1.500)	(-0.568)
MSA_area_2010	0.000	0.000	0.000	0.000	0.000
	(1.055)	(1.057)	(1.057)	(0.329)	(1.229)
Constant	4.559***	4.437***	4.244**	4.198***	4.116**
	(2.761)	(2.680)	(2.567)	(2.735)	(2.383)
Observations	171	171	171	171	171
R-squared	0.188	0.183	0.185	0.298	0.128

	(1)	(2)	(3)	(4)
			Union Rate	
VARIABLES	1986	1993	2003	2013
Rain_d	-5.932***	-5.565***	-4.197***	-4.527***
	(-7.160)	(-8.279)	(-7.099)	(-6.376)
MSA_perc_manuf_1930	27.085***	28.665***	18.489***	16.422***
	(4.697)	(6.678)	(4.654)	(3.816)
MSA_unemployed_1980	7.908			
	(1.074)			
MSA_pop_1980	0.000			
	(0.344)			
MSA_perc_manuf_1980	9.296			
	(1.377)			
MSA_area_1980	0.000			
	(0.031)			
MSA_unemployed_1990		20.995***		
		(3.379)		
MSA_pop_1990		-0.000		
		(-0.162)		
MSA_perc_manuf_1990		-2.862		
		(-0.284)		
MSA_area_1990		0.000		
		(0.770)		
MSA_unemployed_2000			2.560	
			(0.264)	
MSA_pop_2000			-0.000	
			(-1.065)	
MSA_perc_manuf_2000			-11.048	
			(-1.534)	
MSA_area_2000			0.000	
			(1.558)	
MSA_unemployed_2010				-3.945
				(-0.376)
MSA_pop_2010				-0.000
				(-0.049)
MSA_perc_manuf_2010				-16.691
				(-1.500)
MSA_area_2010				0.000
				(0.329)
Constant	3.980***	-4.436	4.069***	4.198***
	(2.876)	(-1.514)	(3.369)	(2.735)
Observations	200	200	173	171
R-squared	0.449	0.502	0.374	0.298

Table VIII: Rain in the 1930s and Migration from 1935 to 1940

This table reports regressions of MSA in-migrants from balance of state on various measures of rain surrounding the MSA. Panel A reports the regression of in-migrants from balance of state from 1935 to 1940, and Panel B reports the regression of in-migrants from balance of state from 1955 to 1960. Rain_1934 is the MSA-level average Standardized Precipitation Index inside the MSA in 1934. Rain_1934_10, Rain_1934_50, and Rain_1934_100 are the MSA-level average Standardized Precipitation Indices within the 10, 50, and 100 miles radius of the MSA. Rain_d is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936). Rain_nd is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the *non*-drought years (1931, 1932, 1933, 1935 and 1937). Control variables include: MSA_unemployed_1930 and MSA_perf_manuf_1930 are the MSA-level unemployment rate and the MSA-level percentage of manufacturing in 1930. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Immigrants from Balance of State 1935-1940				
Rain_1934_in	-0.009**				
	(-2.181)				
Rain_1934_50		-0.009**			
		(-2.242)			
Rain_1934_100			-0.012**		
			(-2.419)		
Rain_d				-0.016**	
				(-2.086)	
Rain_nd					0.005
					(0.406)
MSA_unemployed_1930	-0.130	-0.109	-0.103	-0.199	-0.092
	(-0.317)	(-0.266)	(-0.253)	(-0.479)	(-0.216)
MSA_perc_manuf_1930	-0.095***	-0.095***	-0.091***	-0.104***	-0.094***
	(-2.881)	(-2.868)	(-2.775)	(-3.133)	(-2.691)
MSA_area_1930	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.175)	(-0.183)	(-0.168)	(-0.556)	(-0.804)
MSA_unemployed_1937	-0.306	-0.326	-0.338	-0.303	-0.238
	(-0.884)	(-0.940)	(-0.981)	(-0.872)	(-0.659)
Constant	0.100***	0.100***	0.098***	0.105***	0.101***
	(7.683)	(7.665)	(7.559)	(7.944)	(7.506)
Observations	73	73	73	73	73
R-squared	0.253	0.256	0.264	0.249	0.202

Panel B

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Immigrants from Balance of State 1955-1960				
Rain_1934_in	0.001				
	(0.116)				
Rain_1934_50		0.000			
		(0.000)			
Rain_1934_100			-0.000		
			(-0.005)		
Rain_d				0.007	
				(0.597)	
Rain_nd					0.022
					(1.359)
MSA_unemployed_1930	1.574**	1.571**	1.571**	1.618**	1.553**
	(2.578)	(2.574)	(2.575)	(2.637)	(2.580)
MSA_perc_manuf_1930	-0.175***	-0.174***	-0.174***	-0.171***	-0.160***
	(-3.551)	(-3.546)	(-3.538)	(-3.479)	(-3.210)
MSA_area_1930	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.110)	(-0.082)	(-0.081)	(-0.131)	(-0.591)
MSA_unemployed_1937	-1.535***	-1.538***	-1.539***	-1.520***	-1.439***
	(-2.977)	(-2.978)	(-2.976)	(-2.956)	(-2.806)
Constant	0.197***	0.197***	0.197***	0.195***	0.199***
	(10.150)	(10.141)	(10.108)	(9.989)	(10.362)
Observations	73	73	73	73	73
R-squared	0.337	0.337	0.337	0.341	0.355

Panel C

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Out-migrants to Balance of State and to Contiguous States 1935-1940				
Rain_1934_in	0.003				
	(0.352)				
Rain_1934_50		0.003			
		(0.351)			
Rain_1934_100			0.003		
			(0.326)		
Rain_d				-0.014	
				(-0.941)	
Rain_nd					0.032
					(1.517)
MSA_unemployed_1930	0.146	0.138	0.136	0.066	0.126
	(0.184)	(0.175)	(0.171)	(0.083)	(0.161)
MSA_perc_manuf_1930	0.026	0.025	0.025	0.018	0.046
	(0.403)	(0.401)	(0.389)	(0.288)	(0.719)
MSA_area_1930	-0.000	-0.000	-0.000	0.000	-0.000
	(-0.086)	(-0.083)	(-0.074)	(0.079)	(-0.578)
MSA_unemployed_1937	-0.576	-0.570	-0.569	-0.637	-0.450
	(-0.870)	(-0.860)	(-0.858)	(-0.968)	(-0.687)
Constant	0.146***	0.147***	0.147***	0.149***	0.149***
	(5.866)	(5.868)	(5.862)	(5.963)	(6.046)
Observations	71	71	71	71	71
R-squared	0.033	0.033	0.033	0.045	0.065

Table IX: Forced Migration and Unionization

This table reports regressions of MSA-level unionization rate on the instrumented in-migrants from balance of state from 1935 to 1940, where in-migrants from balance of state from 1935 to 1940 is instrumented by Rain_d. Panel A reports the regression of the MSA-level unionization rate in 1986, 1993, 2003 and 2013. Panel B reports the regression of the *state-level* unionization rate in 1939 on the instrumented *average* in-migrants from balance of state for all MSA in that state from 1935 to 1940. Rain_d is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936). InMigState_3540 is the percentage of in-migrants to the MSA from the same state from 1935 to 1940. IV InMigState_3540 is the instrumented InMigState_3540 using Rain_d. Control variables include: MSA_unemployed_1930 and MSA_perf_manuf_1930 are the MSA-level unemployment rate and the MSA-level percentage of manufacturing in 1930; MSA_unemployed_*y*, MSA_pop_*y* and MSA_perc_manuf_*y* are the MSA-level unemployment rate, the MSA-level population and the MSA-level percentage of manufacturing in year *y*. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	InMigState_3540	UnionRate_1986		UnionRate_1993		UnionRate_2003		UnionRate_2013	
Rain_d	-0.017**								
	(-2.140)								
InMigState_3540		-6.711		5.379		-3.706		19.143	
		(-0.282)		(0.274)		(-0.203)		(0.844)	
IV InMigState _3540			336.811***		329.770***		238.928***		327.692***
			(3.959)		(4.503)		(3.367)		(3.472)
MSA_unemployed_1930	-0.198	35.746	51.782	102.613	119.812**	101.351	105.682*	113.188	100.006
	(-0.481)	(0.434)	(0.700)	(1.540)	(2.058)	(1.663)	(1.883)	(1.475)	(1.418)
MSA_perc_manuf_1930	-0.105***	7.005	45.602***	11.160	47.870***	7.053	37.047***	17.272*	52.009***
	(-3.189)	(0.610)	(3.266)	(1.346)	(4.433)	(0.948)	(3.434)	(1.900)	(3.908)
MSA_area_1930	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.558)	(-0.479)	(-0.625)	(-0.670)	(-0.763)	(-0.404)	(-0.526)	(-0.122)	(-0.014)
MSA_unemployed_1937	-0.309	127.827*	227.927***	6.861	85.909	66.833	145.054***	29.128	135.800**
	(-0.896)	(1.841)	(3.416)	(0.119)	(1.615)	(1.285)	(2.756)	(0.455)	(2.031)
MSA_unemployed_1980		27.985	31.119*						
		(1.567)	(1.941)						
MSA_pop_1980		0.000	0.000						
		(0.151)	(0.586)						
MSA_perc_manuf_1980		29.798*	19.719						
		(1.798)	(1.307)						
MSA_unemployed_1990				21.820	35.635***				
				(1.574)	(2.856)				
MSA_pop_1990				0.000	0.000				
				(0.511)	(0.983)				
MSA_perc_manuf_1990				46.693*	21.618				
				(1.963)	(1.013)				
MSA_unemployed_2000						-5.792	6.749		
						(-0.279)	(0.346)		

MSA_pop_2000						0.000	0.000		
						(0.216)	(0.553)		
MSA_perc_manuf_2000						8.105	-11.453		
						(0.530)	(-0.777)		
MSA_unemployed_2010								-44.230	-12.287
								(-1.589)	(-0.462)
MSA_pop_2010								-0.000	0.000
								(-0.023)	(0.111)
MSA_perc_manuf_2010								-4.156	-37.420
								(-0.170)	(-1.538)
Constant	0.105***	-5.036	-38.836***	-9.949*	-45.339***	-2.949	-26.986***	-0.208	-31.808***
	(8.055)	(-1.181)	(-4.322)	(-1.682)	(-4.840)	(-0.961)	(-3.613)	(-0.054)	(-3.171)
Observations	73	73	73	73	73	72	72	69	69
R-squared	0.256	0.454	0.561	0.410	0.551	0.414	0.503	0.247	0.365

Panel B

	(1)	(2)	(3)
VARIABLES	InMigState_3540 (St. Ave.)	UnionRate_1939 (State)	
Rain_d (St. Ave.)	-0.018*		
	(-1.812)		
InMigState_3540 (St. Ave.)		43.042	
		(0.777)	
IV InMigState_3540 (St. Ave.)			462.108***
			(3.545)
MSA_unemployed_1930 (St. Ave.)	-0.178	160.455	156.193*
	(-0.513)	(1.674)	(1.975)
MSA_perc_manuf_1930 (St. Ave.)	-0.135***	25.011	78.845***
	(-2.842)	(1.512)	(3.812)
MSA_total_area (St. Ave.)	0.000	-0.001***	-0.001***
	(0.739)	(-3.021)	(-4.372)
MSA_unemployed_1937 (St. Ave.)	-0.317	180.290**	260.875***
	(-1.323)	(2.604)	(4.239)
Constant	0.110***	-11.332	-50.850***
	(4.766)	(-1.229)	(-3.707)
Observations	32	31	31
R-squared	0.329	0.466	0.636

Table X: Forced Migration-Unionization Persists and Predicts Today's Unionization

This table reports regressions of state-level unionization rates from 1953 to 2013 on instrumented state-level unionization rate in 1939, where the state-level unionization rate in 1939 is instrumented by the instrumented average in-migrants to the MSA from balance of state from 1935 to 1940, for all MSA in the same state, where average in-migrants to all MSA from balance of state from 1935 to 1940 is instrumented by Rain_d_M. Rain_d_M is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936), averaging over all MSAs in the same state. InMigState_3540 is the percentage of in-migrants to the MSA from the same state from 1935 to 1940, averaging over all MSAs in the same state. IV InMigState_3540_StAve is the instrumented inMigState_3540 averaging over all MSAs in the same state, using Rain_d_M. IV UnionRate_1939 is the instrumented state-level UnionRate_1939 using IV Inmigrants_3540_StAve. Control variables include: State_unemployed_1930_M, Perc_manuf_1930_M and Total_area_M are the MSA-level unemployment rate, the MSA-level percentage of manufacturing and the MSA total area in 1930, averaging over all MSAs in the same state. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	InMigState_3540	UnionRate_1939	Union Rate (State)						
VARIABLES	(St. Ave.)		1953	1964	1973	1983	1993	2003	2013
Rain_d_M	-0.018*								
	(-1.812)								
IV InMigState_3540_StAve		462.108***							
		(3.545)							
IV UnionRate_1939			1.385***	1.473***	0.950***	0.653***	0.616***	0.525**	0.420**
			(3.856)	(5.208)	(3.669)	(3.128)	(3.170)	(2.648)	(2.130)
State_unemployed_1930_M	-0.178	156.193*	67.243	13.030	32.065	8.621	34.266	53.982	38.655
	(-0.513)	(1.975)	(0.582)	(0.143)	(0.385)	(0.128)	(0.548)	(0.846)	(0.610)
Perc_manuf_1930_M	-0.135***	78.845***	11.785	18.500	33.945***	27.875***	21.208**	17.622*	13.598
	(-2.842)	(3.812)	(0.724)	(1.443)	(2.892)	(2.944)	(2.407)	(1.959)	(1.521)
Total_area_M	0.000	-0.001***	0.000	0.000*	0.000	0.000	0.000	0.000	0.000
	(0.739)	(-4.372)	(1.189)	(1.869)	(0.249)	(1.100)	(1.259)	(1.517)	(1.517)
Unemployed_1937_M	-0.317	260.875***	-62.367	-86.814	2.428	18.024	5.578	-11.579	14.820
	(-1.323)	(4.239)	(-0.669)	(-1.183)	(0.036)	(0.333)	(0.111)	(-0.225)	(0.290)
Constant	0.110***	-50.850***	2.003	2.024	-1.270	-0.905	-3.368	-3.768	-4.261
	(4.766)	(-3.707)	(0.266)	(0.341)	(-0.234)	(-0.206)	(-0.825)	(-0.904)	(-1.029)
Observations	32	31	31	31	31	31	31	31	31
R-squared	0.329	0.636	0.645	0.744	0.718	0.677	0.667	0.594	0.530

Table XI: Rain in the 1930s and the Percentage of Manufacturing

This table reports regressions of MSA-level percentage of manufacturing on rain in drought years and the instrumented percentage of in-migrants to the MSA from balance of state using rain in the drought years. The dependent variable in columns (1), (2) and (3) is the MSA-level percentage of manufacturing and the dependent variable in column (5), (6) and (7) is the instrumented MSA-level percentage of manufacturing using Rain_d. Rain_d is the MSA-level average Standardized Precipitation Indices within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936). InMigState_3540 is the percentage of in-migrants to the MSA from the same state from 1935 to 1940. IV InMigState_3540 is the instrumented InMigState_3540 using Rain_d. Control variables include: MSA_unemployed_1930 and MSA_perf_manuf_1930 are the MSA-level unemployment rate and the MSA-level percentage of manufacturing in 1930; MSA_unemployed_*y* and MSA_pop_*y* are the MSA-level unemployment rate and the MSA-level population in year *y*. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	MSA Percentage of Manufacturing			InMigState_3540	MSA Percentage of Manufacturing		
VARIABLES	1940	1970	1980		1940	1970	1980
Rain_d	0.006	0.009	0.001	-0.016**			
	-0.662	-1.537	-0.136	(-2.086)			
IV InMigState_3540					0.045	-0.465	0.97
					-0.106	(-1.073)	-1.381
MSA_unemployed_1930	-2.258***	-1.520***	-1.980***	-0.199	0.382	-1.658***	-0.821
	(-3.656)	(-3.765)	(-3.208)	(-0.479)	-1.027	(-4.482)	(-1.369)
MSA_perc_manuf_1930	0.725***	0.387***	0.551***				
	-14.766	-12.226	-11.638				
MSA_perc_manuf_1930				-0.104***	0.066	0.271***	0.643***
				(-3.133)	-1.354	-5.147	-7.725
MSA_area_1930	0.000***	0.000***	0.000***	0	0	0	0
	-5.403	-3.455	-3.493	(-0.556)	(-0.535)	-0.426	-0.55
MSA_unemployed_1937	2.178***	1.017***	1.304**	-0.303	-0.153	0.995***	0.907*
	-3.948	-2.977	-2.499	(-0.872)	(-0.389)	-2.984	-1.689
MSA_unemployed_1940	-0.360***				-0.250**		
	(-3.075)				(-2.502)		
MSA_pop_1940	-0.000***				0		
	(-3.328)				-0.01		
MSA_unemployed_1970		-0.158***				-0.241***	
		(-4.442)				(-4.166)	
MSA_pop_1970		-0.000**				0	
		(-2.279)				(-0.758)	
MSA_unemployed_1980			-0.275***				-0.323**
			(-3.718)				(-2.571)
MSA_pop_1980			-0.000**				0
			(-2.246)				(-0.474)

Constant	0.042**	0.071***	0.138***	0.105***	0.211***	0.134***	0.029
	-2.297	-7.27	-9.038	-7.944	-4.941	-2.905	-0.387
Observations	200	200	200	73	73	73	73
R-squared	0.7	0.614	0.557	0.249	0.25	0.778	0.727

Table XI: Rain in the 1930s and the Unionization Rate in 1929

This table reports regressions of the state-level unionization rates in 1929 on various measures of weather condition in the drought years (1930, 1934, and 1936) of the 1930s. Rain_d is the state-level average Standardized Precipitation Index over the drought years. Drought_d is the state-level average Palmer Drought Severity Index over the drought years. Maxtemp_d is the state-level average of the maximum temperatures and Avetemp_d state-level is the average of the average temperatures over the drought years. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
VARIABLES		UnionRate_1929		
Rain_d	-0.538			
	(-0.455)			
Drought_d		-0.503		
		(-0.938)		
Maxtemp_d			56.740	
			(1.337)	
Avetemp_d				62.932
				(1.466)
Constant	7.070***	6.523***	6.655***	6.946***
	(7.602)	(5.958)	(8.462)	(10.994)
Observations	48	48	48	48
R-squared	0.004	0.019	0.037	0.045

Table XII:

This table reports the adjusted R-squares of the regressions of the unionization rate in 2013 on various control variables and including versus excluding the instrumented percentage of in-migrants to the MSA from the same state from 1935 to 1940. InMigState_3540 is the percentage of in-migrants to the MSA from the same state from 1935 to 1940. IV InMigState_3540 is the instrumented InMigState_3540 using Rain_d. Rain_d is the state-level average Standardized Precipitation Index over the drought years 1930, 1934 and 1936. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1)	(2)	(3)
VARIABLES	InMigState_3540	UnionRate_2013	UnionRate_2013
Rain_d	-0.016**		
	(-2.086)		
IV InMigState_3540			333.680***
			(3.472)
MSA_unemployed_1930	-0.199	112.217	101.327
	(-0.479)	(1.466)	(1.437)
MSA _manufact_1930	-0.104***	14.236*	52.266***
	(-3.133)	(1.710)	(3.910)
MSA _area_1930	-0.000	-0.000	-0.000
	(-0.556)	(-0.005)	(-0.009)
MSA _unemployed_1937	-0.303	22.242	135.570**
	(-0.872)	(0.351)	(2.029)
MSA _unemployed_2010		-40.938	-12.287
		(-1.488)	(-0.462)
MSA _population_2010		-0.000	0.000
		(-0.150)	(0.111)
MSA_perc_manufact_2010		1.054	-37.420
		(0.045)	(-1.538)
Constant	0.105***	1.191	-32.202***
	(7.944)	(0.342)	(-3.176)
Observations	73	69	69
R-squared	0.249	0.238	0.365
Adjusted R-squared		**0.1502**	**0.2805**

Table XIII:

This table reports regressions of various MSA social and economic outcome variables from 1980 to 2010 on Rain_d surrounding the MSA, where Rain_d is the MSA-level average Standardized Precipitation Index within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936). JobGrowth is the percentage job growth, EstGrowth is the percentage establishment growth, SalGrowth is the percentage salary growth, GovAssist is the percentage growth in government assistance, Young is the percentage growth in the population aged 18 to 34, EduHigh is the percentage growth in highschool graduates, EduUni is the percentage growth in university graduates, and TopIndustry is the percentage growth in the number of establishments that are in top 33-percentile performing industries. Control variables include: MSA_unemployed_1980 and MSA_perf_manuf_1980 are the MSA-level unemployment rate and the MSA-level percentage of manufacturing in 1980. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1) JobGrowth	(2) EstGrowth	(3) SalGrowth	(4) GovAssist	(5) Young	(6) EduHigh	(7) EduUni	(8) TopIndustry
Rain_d	0.431***	0.416***	0.276***	-0.151***	0.012*	0.057***	0.040***	0.044**
	(3.473)	(3.820)	(4.113)	(-11.072)	(1.807)	(4.753)	(3.212)	(2.224)
MSA_unemployed_1980	2.184**	0.376	-0.875	-0.111	-0.164***	0.157	-0.232**	-0.754***
	(2.008)	(0.394)	(-1.490)	(-0.892)	(-2.782)	(1.444)	(-2.040)	(-4.166)
MSA_population_1980	-0.000	-0.000**	-0.000	-0.000**	0.000*	0.000	0.000	-0.000
	(-0.398)	(-2.148)	(-0.337)	(-2.453)	(1.907)	(1.533)	(0.330)	(-0.599)
MSA_perc_manufact_1980	-3.435***	-3.405***	-1.766***	0.062	-0.189***	0.371***	0.423***	-0.767***
	(-4.415)	(-4.991)	(-4.202)	(0.756)	(-4.814)	(5.130)	(5.587)	(-6.375)
MSA_area_1980	0.000	0.000**	0.000**	0.000**	-0.000**	-0.000**	-0.000	0.000
	(0.313)	(2.321)	(2.453)	(2.367)	(-2.195)	(-2.358)	(-0.056)	(1.165)
Constant	1.261***	1.641***	2.768***	-0.704***	-0.171***	-0.391***	-0.453***	0.175***
	(6.018)	(8.929)	(24.448)	(-29.977)	(-15.372)	(-19.004)	(-21.076)	(5.113)
Observation	173	173	173	198	198	198	198	198
R-Squared	0.235	0.255	0.352	0.422	0.164	0.218	0.217	0.240

Table XIV

This table reports regressions of various MSA social and economic outcome variables from 1980 to 2010 on instrumented MSA-level unionization rate in 1986, where the MSA-level unionization rate in 1986 is instrumented by the MSA-level average Standardized Precipitation Index within the 100 miles radius of the MSA over the drought years (1930, 1934 and 1936), Rain_d. JobGrowth is the percentage job growth, EstGrowth is the percentage establishment growth, SalGrowth is the percentage salary growth, GovAssist is the percentage growth in government assistance, Young is the percentage growth in the population aged 18 to 34, EduHigh is the percentage growth in highschool graduates, EduUni is the percentage growth in university graduates, and TopIndustry is the percentage growth in the number of establishments that are in top 33-percentile performing industries. Control variables include: MSA_unemployed_1980 and MSA_perf_manuf_1980 are the MSA-level unemployment rate and the MSA-level percentage of manufacturing in 1980. ***, **, * indicate significance at the 1%, 2%, and 10% level, respectively.

	(1) UnionRate_1986	(2) JobGrowth	(3) EstGrowth	(4) SalGrowth	(5) GovAssist	(6) Young	(7) EduHigh	(8) EduUni	(9) TopIndustry
Rain_d	-6.864***								
	(-8.104)								
IV UnionRate_1986		-0.063***	-0.061***	-0.040***	0.022***	-0.002*	-0.008***	-0.006***	-0.006**
		(-3.473)	(-3.820)	(-4.113)	(11.072)	(-1.807)	(-4.753)	(-3.212)	(-2.224)
MSA_unemployed_1980	11.452	2.903***	1.069	-0.415	-0.363***	-0.144**	0.252**	-0.165	-0.680***
	(1.485)	(2.622)	(1.101)	(-0.694)	(-2.856)	(-2.395)	(2.263)	(-1.419)	(-3.674)
MSA_population_1980	0.000*	0.000	-0.000	0.000	-0.000***	0.000**	0.000**	0.000	-0.000
	(1.779)	(0.383)	(-1.272)	(0.588)	(-4.837)	(2.282)	(2.552)	(1.025)	(-0.110)
MSA_perc_manufact_1980	31.248***	-1.474	-1.513	-0.511	-0.625***	-0.136**	0.630***	0.605***	-0.566***
	(6.090)	(-1.405)	(-1.646)	(-0.902)	(-5.663)	(-2.586)	(6.512)	(5.987)	(-3.519)
MSA_area_1980	-0.000*	-0.000	0.000	0.000	0.000***	-0.000**	-0.000***	-0.000	0.000
	(-1.964)	(-0.539)	(1.355)	(1.413)	(4.984)	(-2.598)	(-3.464)	(-0.823)	(0.618)
Constant	3.814***	1.501***	1.872***	2.921***	-0.788***	-0.165***	-0.359***	-0.431***	0.199***
	(2.619)	(6.752)	(9.604)	(24.327)	(-31.565)	(-13.911)	(-16.433)	(-18.851)	(5.486)
Observation	200	173	173	173	198	198	198	198	198
R-Squared	0.386	0.235	0.255	0.352	0.422	0.164	0.218	0.217	0.240

Online Appendix:
The Impact of Forced Migration on Modern Cities:
Evidence from 1930s Crop Failures

In this appendix, we describe our data sources and the key steps we have taken to collect and compute the main variables used in this study.

1. Union Membership Data

The most comprehensive data source for union membership and coverage in the United State is called the "*Union Membership and Coverage Database from the CPS*" (or UnionStats) and can be found at http://www.unionstats.com/. This database was first constructed by Barry Hirsch and David Macpherson in 2002, and is currently being updated annually. The UnionStats data resource provides private and public sector labor union membership, coverage, and density estimates compiled from the monthly household Current Population Survey (CPS) using BLS methods. The country-level union membership estimates begins in 1973, the state-level and industry-level union membership estimates are available from 1983, and the MSA-level union membership estimates is available from 1986.

For earlier years, UnionStats also provides the database "Union Density Estimates by State, 1964-2014", which is constructed by Barry T. Hirsch, David A. Macpherson, and Wayne G. Vroman. This database use two sources of data: the Current Population Survey (CPS), a monthly survey of U.S. households, and the discontinued BLS publication "*Directory of National Unions and Employee Associations*", based on data reported by labor unions to the government, to produce the state-level union membership density from 1964 to 2014. The description of how this database is constructed can be found in Hirsch, Macpherson, and Vroman (2001).

For state-level union membership before 1964, we use the "U.S. Union Sourcebook: Membership, Finances, Structure, Directory" by Leo Troy and Neil Sheflin. In the 1985 publication, Leo Troy and Neil Sheflin provide state-level union membership figures for 1939, 1953, 1960, 1975, 1980, and 1982. In addition to the published BLS Directories, Leo Troy and Neil Sheflin has used financial

reports made by labor unions to the Department of Labor to provide State estimates of full-time equivalent dues-paying membership.

We estimate the union membership in 1929 by collecting all State Federation of Labor Convention Proceedings. The majority of convention proceedings are available in the microfiche collection "State Labor Proceedings: AFL, CIO and AFL-CIO Proceedings, 1885-1974", which is collected and produced by the AFL-CIO. The list of available state labor proceedings can be found in the book "State Labor Proceedings: A Bibliography of the AFL, CIO, and AFL-CIO Proceedings, 1885-1974, Held in the AFL-CIO Library" by Gary M Kink and Mary Mills (1975). For convention proceedings that are missing from the microfiche collection, we obtain original copies of such convention proceedings from various libraries throughout the country.

For some states, the total membership is reported directly in their annual convention proceedings. For example, in Figure A-1, the Exhibit D and E of the Forty-Fifth Annual Convention of the Massachusetts State Federation of Labor directly reported the complete list of affiliated organizations with the membership number for each affiliated organization. In Figure A-2, page 32 of the Thirtieth Annual Convention of the California State Federation of Labor reported the total membership numbers from 1909 to 1929.

For states that do not directly report membership numbers, we derive the state-level membership by collecting "Receipts-By-Dues" in financial reports and divide that number by "Due-Per-Capita". The numbers of Receipts-By-Dues is easy to find, since all state convention proceedings contain receipts and expenditures in their annual financial reports. The number for Due-Per-Capita is usually harder to find. We read through the entire convention proceedings for 1929, and if the number is not available, we further read convention proceedings for 1928 and 1930.

Figure A-3 shows an excerpt of the convention proceedings for the 46th convention of the Ohio State Federation of Labor. The amount of Receipts-By-Dues for Ohio State in 1929 can be found on page 34, the top 2 lines of the right text column. The total per-capita tax from July 1, 1928 to June 30, 1929 was reported to be $10,726.62. The number of Due-Per-Capita can also be found in the same convention proceedings on page 30, bottom right text column:

"This convention will be called upon to consider the finances of the Federation by reason of the recommendation of your Executive Board, in its report to this convention, that **the per capita tax be increased from one per cent per month per member to two cents per month.**"

We also utilize the 1929 edition of the "Handbook of American Trade Unions" published by the Bureau of Labor Statistics as a second data source to estimate the state-level unionization rate in 1929. The handbook contains detailed information of all labor union organizations of the United States that were affiliated to and not affiliated to the American Federation of Labor, as long as they had "national entity and significance". More specifically, for each national union organization, the handbook lists detailed information about the total membership and the number of local union organizations located in each states. We employ a similar method as Troy and Sheflin (1985) to estimate the state-level union membership. We first estimate the state-by-state membership number for each parent organization by combining the total membership number with the relative strength of the member organizations in each state. We then aggregate the membership numbers of all local union organizations for all parent organizations to obtain the state membership figures.

2. Rain and Drought Data

We obtain the climate division level and the state level climate values from the National Climate Data Center (NOAA). There are 344 climate divisions in the continental United States, and the climate values for each climate division are

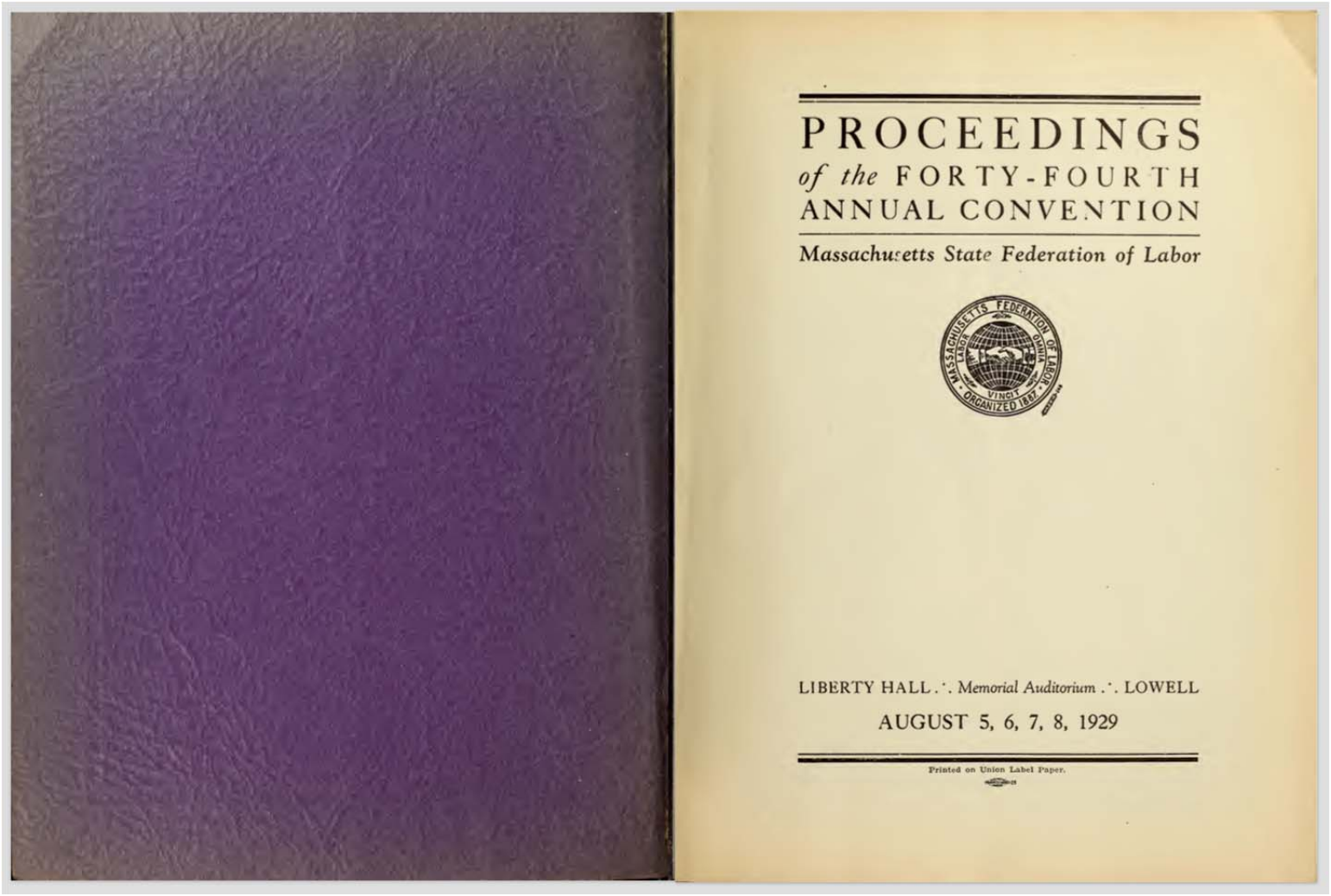
computed by using observations from all weather stations inside that climate division. A climate division lies entirely within a state and hence the state level climate values are computed by taking the area weighted average climate values of all climate divisions inside that state. For many states, counties lie complete within a climate division inside that state. However, there are a lot of cases where a county can intersect with many climate divisions. For these cases, we superimpose the climate division boundary map with the county boundary map in order to identify and compute the intersected areas between a county and the climate divisions. We then estimate the climate values at the county level and at the MSA level (an MSA is just a collection of counties) by taking the weighted average of the climate values of all climate divisions that intersect with that county/MSA. We also compute the climate values for the surrounding areas that expand 50 and 100 miles outward of the MSAs using a similar method. We intersect the buffer areas around the MSA with all climate divisions and compute the weighted average climate values of all intersected climate divisions.

Figure A-4 shows the boundaries of all climate divisions in the continental United States and also illustrate an example of the buffer area around Dallas. The blue area is the Dallas MSA and the red area is the buffer zone that expands 100 miles outward of Dallas.

3. Internal Migration Data

We obtain the internal migration data from the 16th Census of the United States. The description of the data can be found in "Chapter 3: Internal Migration, 1935 to 1940" and the data can be found in Tables 17, 18 and 19. Figure A-5 shows an excerpt of Table 18, which contains internal migration data from 1935 to 1940 for Boston. The number of In-migrants is broken down into Male/Female, From Balance of State, From Contiguous State, and Form Noncontiguous State and further broken down into Urban, Rural-nonfarm, and Rural-farm.

Figure A-1: Proceedings of the 45th Annual Convention of the Massachusetts State Federation of Labor



PROCEEDINGS
of the FORTY-FOURTH
ANNUAL CONVENTION

Massachusetts State Federation of Labor

LIBERTY HALL .·. *Memorial Auditorium* .·. LOWELL

AUGUST 5, 6, 7, 8, 1929

Printed on Union Label Paper.

Exhibit B

STATEMENT OF RECEIPTS AND DISBURSEMENTS
FROM JULY 1, 1929, TO DECEMBER 31, 1929

Receipts

July	$842.71	
August	1,024.04	
September	427.88	
October	1,196.84	
November	275.78	
December	947.66	
Total		$4,714.91

Disbursements

July	$754.63	
August	1,692.82	
September	352.05	
October	886.73	
November	761.08	
December	710.01	
Total		$5,157.32
Excess of disbursements over receipts		$442.41
Cash balance June 30, 1929		825.04
Balance December 31, 1929		$382.63

Exhibit C

ANALYSIS OF EXPENSES
JULY 1, 1929, TO DECEMBER 31, 1929

Payments to Feinberg	$604.35
Office expense	58.82
Postage, stationery and printing	72.00
Secretary and Treasurer's Salary	1,689.18
Assistant Secretary	750.00
Rent and light	380.33
Miscellaneous expense	28.82
Telephone and telegraph	69.82
Legal expense	150.00
Auditing	50.00
Auditing Committee	64.50
Credential Committee	50.00
Convention expense	449.30
Executive Board expenses	710.20
Total	$5,157.32

Exhibit D

LIST OF AFFILIATED ORGANIZATIONS IN ARREARS, SHOWING REPORTED MEMBERSHIP AND AMOUNTS DUE DECEMBER 31, 1929

Name	Membership per last Report	Number of Months in Arrears	Amount Due
Carpenters No. 831	160	3	$7.20
I. A. T. S. E. and Moving Picture Operators No 454	9	6	.81
Asbestos Workers No. 6	150	6	13.50
Bakers No. 7	100	6	9.00
Barbers No. 182	305	6	27.45
Blacksmiths No. 105	100	3	4.50
Bookbinders No. 56	100	3	4.50
Boot & Shoe Workers No. 0	89	3	4.01
Boot & Shoe Workers No 229	1145	6	103.05
Boot & Shoe Workers No. 512	25	18	6.75
Carpenters No. 51	650	1	9.75
Carpenters No. 157	249	1	3.74
Electric Workers No. 103	900	3	40.50
Engineers No. 849	100	6	9.00
Federal Employees No. 25	500	2	15.00
Metal Polishers No. 95	85	3	3.83
Milk Wagon Drivers No. 380	500	6	45.00
News Writers No. 17662	30	6	2.70
Painters No. 11	1000	3	45.00
S. B. A. & O. E. U. No. 14965	50	6	4.50
Structural Iron Workers No. 7	700	6	63.00
Team Drivers No. 25	1000	1	15.00
United Garment Workers No. 1	350	6	31.50
United Garment Workers No. 98	30	6	2.70
Waitresses No. 112	85	3	3.83
Wood-Wire-Metal Lathers No. 72	250	6	22.50
C. L. U., Brockton		3	3.75
Carpenters No. 1550	286	1	4.29
Barbers No. 238	100	3	4.50
Boot & Shoe Workers No. 35	1377	3	61.97
Boot & Shoe Workers No. 36	838	3	37.71
Boot & Shoe Workers No. 100	930	3	41.85
Boot & Shoe Workers No. 118	547	3	24.62
Boot & Shoe Workers No. 256	347	3	15.62
Boot & Shoe Workers No. 357	667	3	30.02
Mixed Union Boot & Shoe No. 38	700	6	63.00
Carpenters No. 624	360	6	32.40
Typographical No. 224	76	3	3.42
Brick and Clay Workers No. 411	48	6	4.32
Bookbinders No. 204	75	3	3.38
Federation of Teachers No. 195	66	3	2.97
A. A. St. E. R. E. of A. No. 240	240	6	21.60
Barbers No. 894	30	5	2.25
Barbers No. 331	50	3	2.25
C. L. U., Fall River		6	7.50
C. L. U., Fitchburg		3	3.75
A. A. St. E. R. E. of A. No. 690	78	3	3.51
Barbers No. 284	40	3	1.80
Electrical Workers No. 256	40	3	1.80
Barbers No. 389	16	4	.96
Plumbers & Steamfitters No. 92	23	6	2.07
Barbers No. 375	50	3	2.25
Barbers No. 391	34	2	1.02
Boot & Shoe Workers No. 1	255	3	11.48
Carpenters No. 82	135	2	4.05
Cooks & Waiters No. 201	172	3	7.74
Federal Employees No. 51	42	3	1.89
C. L. U., Holyoke		3	3.75
Bakery & Conf. Workers No. 96	60	6	5.40
Paper Makers No. 1	100	3	4.50
Full Fashioned Hosiery Workers No. 21	38	6	3.42
Typographical No. 253	52	3	2.34

Name	Membership per last Report	Number of Months in Arrears	Amount Due
Stage Hands No. 89	20	5	1.50
Textile Workers No. 1197	120	6	10.80
A. A. St. E. R. E. of A. No. 261	100	6	9.00
Boot & Shoe Workers No. 1190	421	3	18.95
Bottlers & Drivers No. 119	24	3	1.08
Carpenters No. 111	200	6	18.00
Carpenters No. 1092	43	6	3.87
Painters & Decorators No. 44	164	3	7.38
Plumbers and Steamfitters No. 283	67	3	3.02
Moving Picture Operators No. 256	18	3	.81
Trades & Labor Council		3	3.75
A. A. St. E. R. E. of A. No. 280	207	1	3.11
Barbers No. 323	48	2	1.44
Electrical Workers No. 588	60	3	2.70
Carpenters No. 1610	155	3	6.98
Cigarmakers No. 255	20	6	1.80
Iron Moulders No. 85	58	3	2.61
Machinists No. 138	50	5	3.75
Moving Picture Operators No. 546	11	3	.50
Typographical No. 310	110	6	9.90
Barbers No. 347	100	2	3.00
Carpenters No. 595	547	4	32.82
C. L. U., Lynn		3	3.75
Painters, Decorators & Paperhangers No. 111	150	8	18.00
Teamsters No. 42	249	3	11.21
Typographical No. 20	116	3	5.22
Theatrical Stage Emp. No. 73	23	4	1.32
Overpaid 6c to August			
Electrical Workers No. 377	80	3	3.60
Journeymen Plumbers and Steamfitters No. 550	55	6	4.95
Carpenters No. 1271	21	12	3.78
Boot & Shoe Workers No. 20	561	3	25.25
Plumbers & Steamfitters No. 201	126	3	5.67
Barbers No. 447	97	3	4.45
Carpenters No. 1021	109	2	3.27
Musicians No. 214	200	11	33.00
I. A. T. S. E. No. 83	17	6	1.53
A. A. St. E. R. E. of A. No. 549	52	1	.78
Theatrical Stage Emp. No. 232	21	4	1.26
Full Fashioned Hosiery Workers No. 12	150	3	6.75
Carpenters No. 866	112	3	5.04
I. B. Bookbinders No. 176	120	5	9.00
Carpenters No. 1579, Onset	24	1	.36
Carpenters No. 444	238	6	14.52
Carpenters No. 159	47	1	.71
C. L. U., Quincy		6	7.50
A. A. St. E. R. E. of A. No. 253	124	6	11.16
Carpenters No. 762	434	1	6.51
Barbers No. 390	52	2	1.56
C. L. U., Rockland		3	3.75
Boot & Shoe Workers No. 48	810	9	109.35
C. L. U., Salem		3	3.75
A. A. St. E. R. E. of A. No. 246	85	3	3.83
Barbers No. 385	97	3	4.37
Electrical Workers No. 259	65	3	2.93
I. A. T. S. E. No. 196	19	6	1.71
Machinists No. 348	10	6	.90
Carpenters No. 2070	27	6	2.43
United Textile Workers No. 33	2000	3	90.00
Loom Fixers No. 30	82	3	3.69
Boot & Shoe Workers No. 143	516	3	23.22
Barbers No. 30	100	7	10.50
Building Serv. Emp. No. 75	8	2	.24
Carpenters No. 96	340	1	5.10
Carpenters No. 1105	55	3	2.48
Pattern Makers League	45	3	2.03
Moving Picture Operators No. 186	45	3	2.03
Tobacco Strippers No. 519	23	1	.35
Plumbers No. 89	130	3	5.85
Painters No. 257	100	3	4.50
Steamfitters & Helpers No. 603	80	3	3.60
Electrical Workers No. 7	115	3	5.18
A. A. St. E. R. E. of A. No. 243	87	5	6.53
C. L. U., Taunton		4	5.00
Metal Polishers No. 154	30	12	5.40
Bakers No. 54	34	6	3.06
A. A. St. E. R. E. of A. No. 600	260	6	23.40
Barbers No. 711	50	5	3.75
Federal Labor Union	16	6	1.44
Carpenters No. 708	158	1	2.37
Boot & Shoe Workers No. 278	11	3	.50
Boot & Shoe Workers No. 69	100	3	4.50
Carpenters No. 991	55	3	2.48
Carpenters No. 885	70	3	3.15
C. L. U., Worcester		2	2.50
A. A. St. E. R. E. of A. No. 22	600	6	54.00
Barbers No. 186	151	3	6.80
Bottlers & Drivers No. 180	17		.02
June 28th payment short 2c			
Carpenters No. 408	152	3	6.84
Carpenters No. 877	75	3	3.38
Electrical Workers No. 96	100	6	9.00
Moulders No. 5	200	3	9.00
Machinists No. 339	23	7	2.42
I. A. T. S. E. & Moving Picture Operators No. 96	74	3	3.33
Web Pressmen No. 29	28	6	2.52
Typographical No. 165	217	3	9.43
17c overpaid November			
Stationary Firemen & Oilers No. 88	32	3	1.44
Painters No. 253	150	3	6.75
Moving Picture Mach. Oper. No. 245	30	3	1.35
Marine Plumbers No. 829	45	2	1.35
Neckwear Workers No. 15200	60	3	2.70
Telephone Operators No. 1-A	200	6	18.00
C. L. U., Framingham		6	7.50
Carpenters No. 551	146	3	6.57
Steamfitters & Helpers No. 277	55	3	2.48
Plumbers No. 448	60	3	2.70
C. L. U., Northampton		3	3.75
Plumbers & Steamfitters No. 138	125	2	3.75
Total	30418		$1,785.34

Exhibit E

LIST OF AFFILIATED ORGANIZATIONS IN GOOD STANDING OR PAID IN ADVANCE, SHOWING LAST REPORTED MEMBERSHIP DECEMBER 31, 1929

Name	Membership per last Report
Barbers No 250	10
C. L. U., Boston	—
A. A. St. E. R. E. of A. No. 589	6000
Bartenders No. 77	17
Bottlers & Drivers No. 122	100
Brewery Workers No. 14	50
Brewery Workers No. 29	16
Bridge Tenders No. 12333	40
Carpenters No. 40	900
Cement & Asphalt Finishers No. 534	200
Cigarmakers No. 97	700
City Men No. 149	150
Cooks and Pastry Cooks Association No. 186	300
Delivery Drivers and Chauffeurs No. 394	50
Electric Workers No. 104	200
Electrotypers No. 11	150
Elevator Construction No. 4	306
Firemen No. 3	400
Gas Distributors No. 15268	100
Gas Fitters and Fixture Hangers No. 175	28
Hoisting & Portable Engineers No. 4	300
Hotel & Restaurant Employees No. 34	800
Machinists No. 264	334
Mailers No. 1	230
Moving Picture Operators No. 182	114
Municipal Women Employees No. 15906	15
Paid in advance 3c	
Musicians No. 9	2315
News Wagon Drivers No. 259	426
Newspaper Web Pressmen No. 3	500
Photo Engravers No. 3	100
Plumbers No. 12	200
Printing Pressmen No. 67	200
Press Assistants' No. 18	200
Sheet Metal Workers Int. Ass'n No. 17	500
Steamfitters No. 537	500
Stereotypers No. 2	174
Typographical No. 13	1793
Theatrical Stage Employees No. 11	411
Team Drivers No. 379	60
United Garment Workers No. 163	170
United Hatters No. 6	50
Paid in advance $2.25	
Carpenters No. 878	210
A. A. St. E. R. E. of A. No. 235	133
Bakery & Confectionery Workers No. 180	80
C. L. U., Cambridge	—
Paid in advance $3.75	
A. A. St. E. R. E. of A. No. 174	152
Moving Picture Operators No. 424	14
Fish Splitters & Handlers No. 14270	8
Bill Posters No. 64	9
I. A. T. S. E. No. 381	14
A. A. St. E. R. E. of A No. 537	213
Electrical Workers No. 707	40
Stationary Fireman, Helpers and Oilers No. 4	150
C. L. U., Lawrence	—
Printing Pressmen No. 89	29
A. A. St. E. R. E. of A. No. 238	180
Electrical Workers No. 622	20
Plumbers and Steamfitters No. 145	115
United Textile Workers of A. No. 771	340
Boot & Shoe Workers No. 40	20
Spinners No. 1651	110
Paid in advance $3.30	
United Garment Workers No. 124	35
Printing Pressmen No. 35	96
C. L. U., Pittsfield	—
Paid in advance $1.25	
Moving Picture Operators No. 452	16
C. L. U., Somerville	—
C. L. U., Springfield	—
A. A. St. E. R. E. of A. No. 448	534
Bakery & Confectionery Workers No. 32	81
Bill Posters No. 15	14
Cigarmakers No. 49	80
Cigarmakers No. 326	12
Moving Picture Operators No. 505	29
Moulders No. 102	34
Paperhangers No. 483	42
Quarryworkers No. 81	60
Paid in advance 90c	
Cotton Weavers No. 26	10
Stage Employees No. 131	21
Total	22010

CERTIFIED PUBLIC ACCOUNTANT'S REPORT — to June 30, 1930

Massachusetts State Federation of Labor,
11 Beacon Street,
Boston, Mass.

Gentlemen: We have completed our examination of your books and records for the six-month period ending June 30, 1930, which date coincides with the close of your fiscal year.

The following financial statements have been prepared as a result of this examination and are attached hereto:—

Exhibit A—Statement of Financial Condition as at June 30, 1930.

Exhibit B—Statement of Receipts and Disbursements from January 1, 1930, to June 30, 1930.

Exhibit C—Analysis of Expenses, January 1, 1930, to June 30, 1930.

Exhibit D—List of Affiliated Organizations in Arrears, showing reported membership and amounts due, June 30, 1930.

Exhibit E—List of Affiliated Organizations in Good Standing or Paid in Advance, showing last reported membership, June 30, 1930.

Exhibit F—Statement of Receipts and Disbursements for Fiscal Year ended June 30, 1930.

Exhibit G—Analysis of Expenses for Fiscal Year ended June 30, 1930.

During the six months just completed receipts from dues were $4,463.53, as compared with $5,303.01 for the same six months of 1929—a shrinkage in receipts from dues of $840.00.

The disbursements for the six months just closed are $3,762.25, as compared with disbursements of $5,072.46 for the same six months one year ago.

Additional income for this period has been received from the Poster Account, totalling $787.40, against which expenses of $669.40 have been paid.

The excess of receipts over disbursements is $819.28, which, added to the balance at the beginning of the year, leaves a cash balance now in the treasury of $1,201.91. At the end of the fiscal year June 30, 1929, your cash balance was $825.04.

There is now due from affiliated organizations $1,974.24, which, with the cash on hand, gives total assets at full realizable value of $3,176.15. From this should be deducted unpaid officers' salaries of $1,562.40, and unpaid bills of $431.76, which, with dues paid in advance of $141.34, makes a total liability against your organization of $2,135.50.

Your equity in the assets is, therefore, $1,040.65. On June 30, 1929, the Massachusetts State Federation equity in the assets was $2,037.63.

The expenses of operation for the six months under examination were $4,431.65. The details are furnished in Exhibit C.

In Exhibit F we are showing receipts and disbursements for the twelve months, July 1, 1929, to June 30, 1930. The receipts for that period were $9,965.84, and the expenses of operation $9,588.97. An analysis of expenditures for the year is given in Exhibit G.

At the close of this fiscal year one hundred twenty-four organizations were in arrears, one hundred six in good standing, and twenty-one paid in advance, which makes total affiliated organizations of two hundred fifty-one, representing a total membership of 50,076. The organizations in arrears represent a membership of 20,520, and the organizations paid in advance and in good standing 29,556.

Included in the organizations in good standing is the Fish Splitters and Handlers No. 14270. The charter of this unit was discontinued on the date of last payment.

We have made a detailed check of the disposition of all income received, vouched the cancelled checks against the entries in the records, saw duplicate receipts for all dues received from affiliated organizations, saw receipted bills for all payments made, and reconciled the cash balance appearing on the books with the balance reported by the depository bank.

Our check of the poster account was confined to a scrutiny of the receipts from that source as listed in the Federation books. All money so received has been properly accounted for. Confirmation of the income has been requested from the Springfield representative of the organization through the Secretary-Treasurer, as there is no information in the office files to verify that income.

We are pleased to report to the officers that the books and records of the organization are being well and carefully maintained.

Yours very truly,

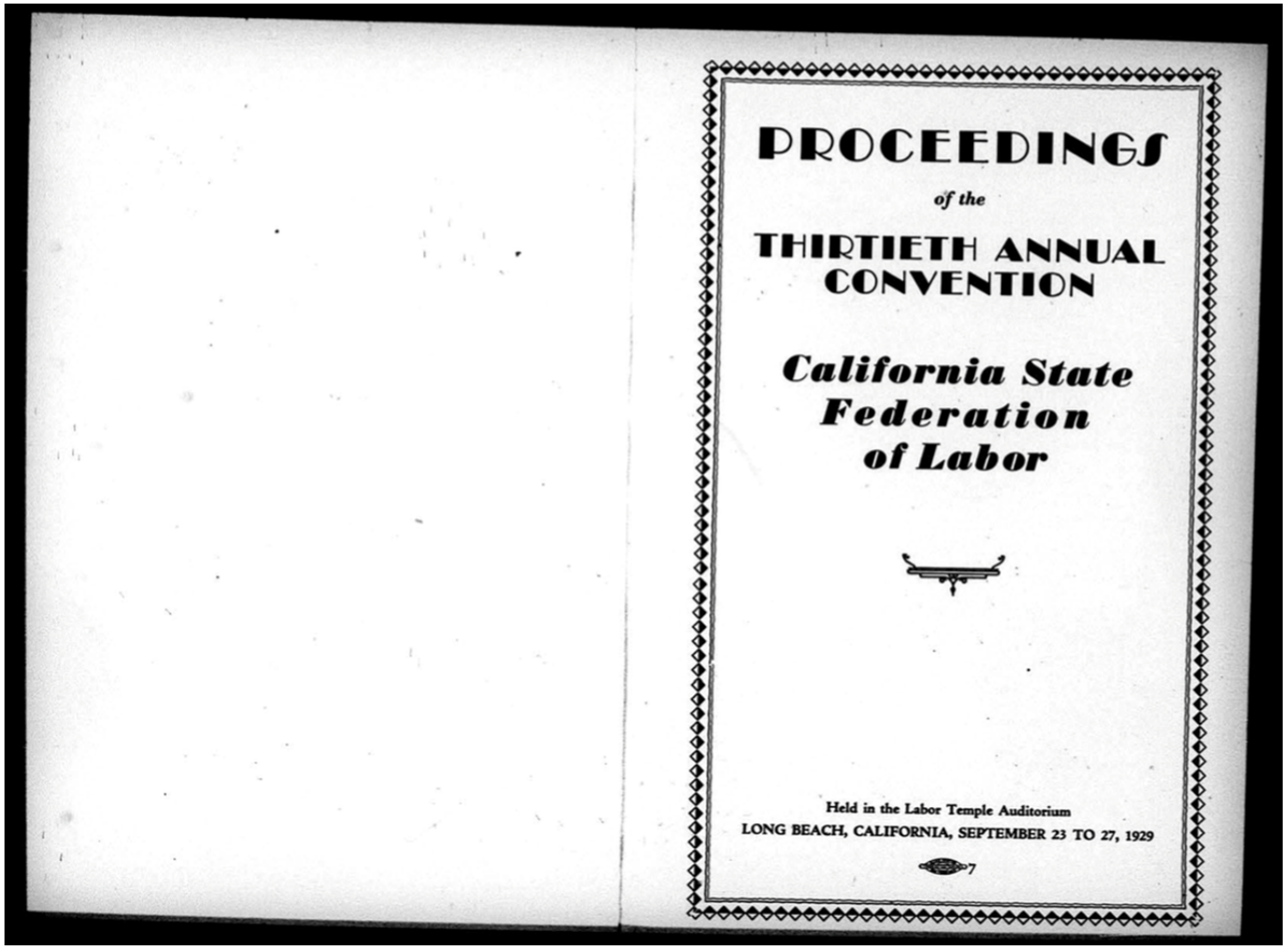
P. J. MOYNIHAN & COMPANY,
Certified Public Accountants.
By P. J. Moynihan, C. P. A.

Exhibit A

STATEMENT OF FINANCIAL CONDITION AS AT JUNE 30, 1930

Assets	
Cash on hand and in bank	$1,201.91
Due from affiliated organizations	1,974.24
Total Assets	$3,176.15
Liabilities	
Accounts payable	$431.76
Salaries payable to officers	1,562.40
Dues paid in advance	141.34
Total Liabilities	$2,135.50
Excess of Assets over Liabilities	$1,040.65

Figure A-2: Proceedings of the 30th Annual Convention of the California State Federation of Labor



PROCEEDINGS

of the

THIRTIETH ANNUAL CONVENTION

California State Federation of Labor

Held in the Labor Temple Auditorium

LONG BEACH, CALIFORNIA, SEPTEMBER 23 TO 27, 1929

7

ating the Mooney Defense Committee for the Northwest. This particular committe had up to that time collected $9,673.07. The committee had expended $8,872.20 to carry on its work. There was a balance on hand of only $800.87. Not one dollar had been forwarded to the Mooney Defense at San Francisco.

At about this time there was organized the Tom Mooney Molders' Defense Committee. This committee was not appointed by the Molders' Union but it proceeded at once with the collection of funds.

On May 10, 1920, E. D. Nolan, Secretary of the International Workers Defense League (and one of the most active men in the Mooney defense), notified the Executive Council of the California State Federation of Labor that the League at a regular meeting on May 8, 1920, had decided to terminate its active connection with the defense in the Mooney case.

No financial statement was ever issued by the Molders' Committee and when attention was called to this fact at the Portland convention of the American Federation of Labor, Rena Mooney supplied Secretary Morrison with the following statement which was designated as an "audit":

"To Whom It May Concern: This will certify that the undersigned committee from Local 164, International Molders' Union of North America, has audited the books of the Tom Mooney Molders' Defense Committee from November 1, 1920 to December 31, 1923, and found them to be thoroughly satisfactory in every respect; all moneys received and disbursed having been duly accounted for. (Signed) B. Seebaum, F. M. Gorman, Martin Eagan, L. P. Warner."

If there has been any subsequent "audit" of funds collected by the Molders' Defense Committee it has not been brought to the knowledge of the California State Federation of Labor.

MEASURES ON NOVEMBER BALLOT

A total of twenty-one measures, comprising twenty Constitutional Amendments and the Veteran's Bond Act, will be submitted to the people of California at the General Election in November, 1930. It is likely that one or more Initiatives will also qualify for the ballot. At this time definite action is recommended on six measures, as follows:

Description of Measure on Ballot	Recommendation
S. C. A. 6—Exempting non-profit hospitals from taxation.	Yes
S. C. A. 27—Providing that not to exceed one-half the State taxes on fire insurance company premiums shall go to firemen's pension funds.	Yes
A. C. A. 17—Prohibiting judges of courts of record, including municipal courts, from practicing law either "in or out of court."	Yes
A. C. A. 37—Authorizing the Legislature to set up retirement salary system for State employees.	Yes
Twenty Million Dollar Veteran's Bond Act.	Yes
S. C. A. 28—Ten million dollar bond issue for San Francisco Harbor improvements.	Yes

STATE FEDERATION MEMBERSHIP STATISTICS

	Local Unions Affiliated	Labor Councils Affiliated	Total Affiliations	Total Membership
October 1, 1909	151	11	162	25,000
October 1, 1910	244	12	256	45,000
October 1, 1911	362	12	374	56,000
October 1, 1912	429	15	444	62,000
October 1, 1913	502	15	517	67,000
October 1, 1914	512	18	530	69,000
October 1, 1915	498	18	516	66,500
October 1, 1916	481	21	502	68,000
October 1, 1917	498	21	519	71,500
October 1, 1918	486	21	507	78,000
October 1, 1919	515	24	539	94,900
October 1, 1920	549	27	576	104,200
October 1, 1921	568	27	595	100,100
October 1, 1922	664	27	691	91,000
September 1, 1923	626	25	651	87,500
September 1, 1924	633	25	658	92,000
September 1, 1925	607	25	652	95,400
September 1, 1926	662	27	689	96,600
September 1, 1927	648	28	676	95,200
September 1, 1928	647	30	677	96,100
September 1, 1929	623	32	655	99,000*

***Explanatory Note.**—The recorded membership is based on the per capita tax paid to this Federation. Local unions pay per capita tax only on members in good standing. It is estimated that an average of 15 per cent of the members of local unions are usually in bad standing. Again, it is regrettable, but true, that a few local unions do not even pay per capita tax on the full membership in good standing.

It should also be noted that a number of local unions are not affiliated with this Federation, although the constitution of the A. F. of L. makes such affiliation a duty! In my estimation of the total trade-union membership in California the foregoing facts should be duly considered. Conservatively speaking, it is believed that the A. F. of L. trade-union membership in California is in excess of 125,000. If we add the membership of the four Railroad Brotherhoods, who are not in affiliation with the A. F. of L., the minimum total California trade-union membership must be placed at about 150,000.

Report of Membership, 1928-1929

Labor Councils in good standing, September 1, 1928	30	
Local Unions in good standing, September 1, 1928	647	
		677
Labor Councils affiliated during the year	2	
Local Unions affiliated during the year	10	
		12
		689
Amalgamated with other unions	3	
Charters surrendered	4	
Suspended for nonpayment of per capita tax	27	
		34
Organizations in good standing, September 1, 1929		655
Approximate membership of newly affiliated unions plus increase in membership of unions already affiliated		7300
Approximate decrease in membership of affiliated unions plus loss of membership in unions listed as suspended, etc.		4400
Net increase in membership		2900

New Affiliations

LONG BEACH
Cleaners, Dyers and Pressers No. 17965.

MARTINEZ
Oil Workers No. 5.

PITTSBURG
Sacramento River Fishermen.

SALINAS
Central Labor Union.

SANTA BARBARA
Sheet Metal Workers No. 364.

SAN FRANCISCO
Chauffeurs No. 265.
Cleaners, Dyers, Pressers No. 17960.
Longshore Lumbermen's Assn.
Masters, Mates and Pilots No. 89.
Masters, Mates and Pilots of the Pacific.

SAN LUIS OBISPO
Central Labor Union.
Culinary Workers No. 98.

Amalgamated With Other Unions

Elementary School Teachers No. 44 with High School Teachers of Sacramento.
Shipwrights No. 759, Carpenters No. 449, San Francisco, with Shipwrights No. 875, Oakland.

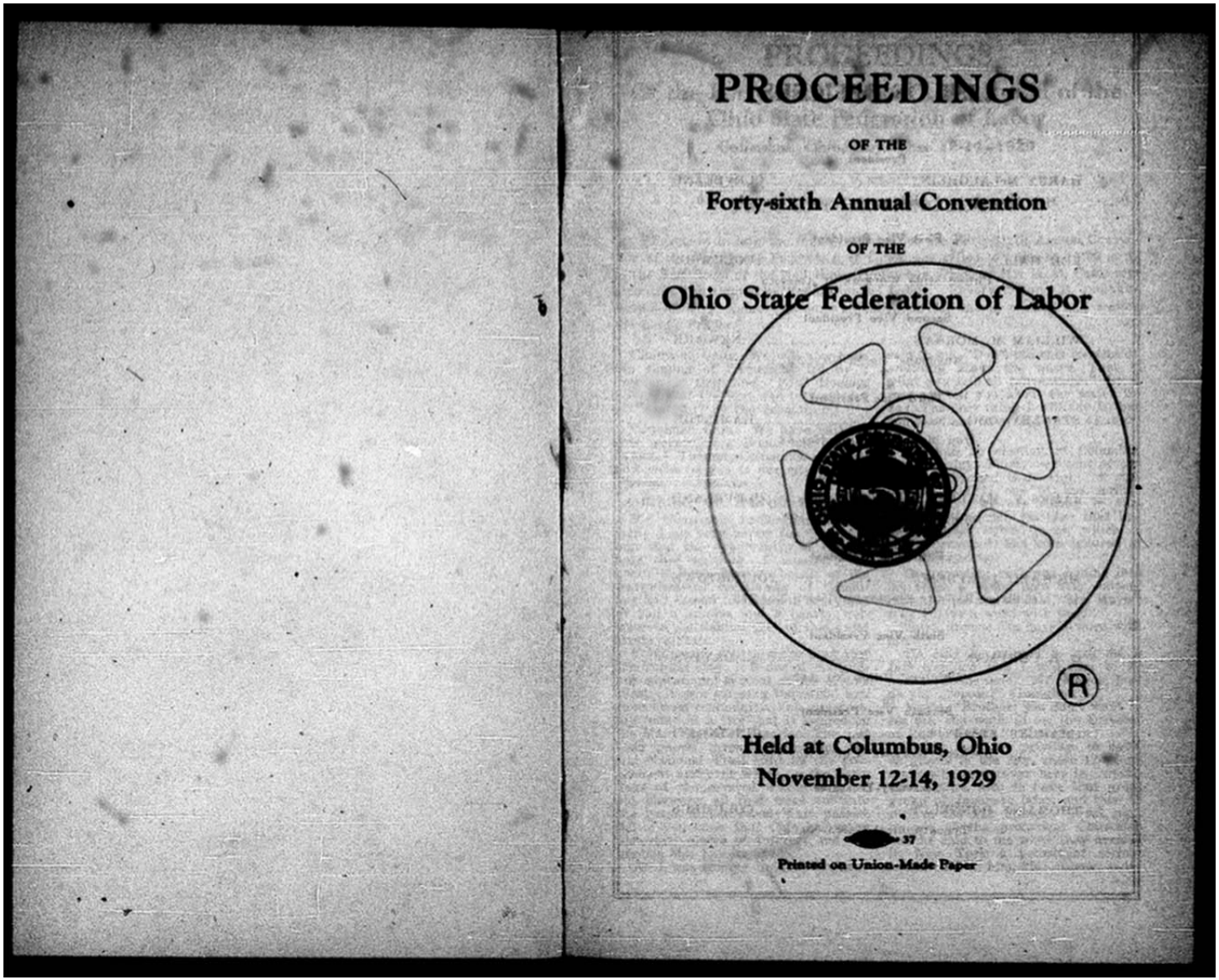
Charters Surrendered

Building Service Employees No. 64, Los Angeles.
Hoisting and Portable Engineers No. 391, Los Angeles.
Cleaners and Dyers No. 17967, Oakland.
Fire Fighters No. 230, San Jose.

Suspended for Non-Payment of Per Capita Tax

Carpenters No. 1481, Colusa.
Carpenters No. 1963, Crescent City.
Printing Pressmen No. 279, Eureka.
Stage Employees No. 430, Eureka.
Mailers No. 59, Fresno.
Railroad Signalmen No. 100, Los Angeles.
Retail Clerks No. 406, Los Angeles.
Steamfitters No. 95, Los Angeles.
Street and Highway Engrs. No. 941, Los Angeles.
Barbers No. 863, Merced.
Musicians No. 652, Modesto.
Plumbers No. 62, Monterey.
Stage Employees No. 327, Napa.
Oil Workers No. 12, Orcutt.
Tailors No. 272, Pasadena.
Barbers No. 253, San Bernardino.
Electrical Workers No. 477, San Bernardino.
Retail Clerks No. 769, San Diego.
Pavers No. 18, San Francisco.
Post Office Laborers No. 17831, San Francisco.
Lathers No. 278, San Mateo.
Painters No. 83, San Rafael.
R. R. and Steamship Clerks No. 751, Santa Barbara.
Painters No. 821, Santa Monica.
Lathers No. 98, Stockton.
Painters No. 1115, Stockton.
Post Office Clerks No. 45, Vallejo.

Figure A-3: Proceedings of the 46th[th] Annual Convention of the Ohio State Federation of Labor



PROCEEDINGS

OF THE

Forty-sixth Annual Convention

OF THE

Ohio State Federation of Labor

Held at Columbus, Ohio
November 12-14, 1929

37

Printed on Union-Made Paper

Painters 643	5.00
Plumbers 510	5.00
Sheet Metal Workers 95	2.00
Stage Employes 282	2.00

NEWARK

Barbers 172	2.00
Boilermakers 99	2.00
Bricklayers 27	2.00
Carpenters 136	3.00
Central Labor Union	15.00
Flint Glass Workers 4	5.00
Flint Glass Workers 30	5.00
Glass Bottle Blowers 24	5.00
Machinists 463	2.00
Maintenance of Way 838	5.00
Painters 356	2.00
Retail Clerks 178	2.00
Stage Employes 71	5.00
Street Railway Employes 839	5.00
Teamsters 263	5.00

NILES

Central Body	3.00
Iron and Steel Workers 66	20.00

NORWALK

Barbers 320	2.00
Central Body	2.00

PIQUA

Fire Fighters 252	2.00
Iron Molders 94	3.00

PORTSMOUTH

Bartenders 429	5.00
Carpenters 437	10.00
Central Labor Union	10.00
Electrical Workers 575	2.00
Machinists 349	2.00
Painters 555	5.00
Plumbers 577	10.00
Sheet Metal Workers 323	5.00
Typographical 637	10.00

SANDUSKY

Barbers 263	3.00
Bricklayers 37	5.00
Carpenters 940	5.00
Central Body	5.00
Painters 788	2.00
Plumbers 224	2.00

SPRINGFIELD

Bricklayers 25	2.00
Brewery Workers 45	2.00
Carpenters 660	5.00
Central Labor Union	10.00
Musicians 160	5.00
Musicians 782	2.00
Painters 533	2.00
Photo Engravers 29	2.00
Plasterers 441	5.00
Plumbers 97	2.00
Stage Employes 34	5.00
Stereotypers and Electrotypers 55	10.00
Street Railway Employes 845	2.00
Street Railway Employes 851	10.00
Typographical 117	10.00

STEUBENVILLE

Bricklayers 14	3.18
Carpenters 186	25.00
Central Labor Union	10.00
Electrical Workers 246	5.00
Fire Fighters 228	2.00
Potters 20	5.00
Stage Employes 315	2.00
Typographical 238	10.00

TIFFIN

Barbers 558	5.00
Carpenters 243	2.00

TOLEDO

Electrical Workers 245	5.00
Engineers 10	5.00
Federal Employes 142	2.00
Firemen and Oilers 2	10.00
Flint Glass Workers 19	2.00
Garment Workers 186	2.50
Iron Molders 425	2.00
Letter Carriers 100	10.00
Machinists 105	5.00
Machinists 1210	3.00
Musicians 15	5.00
Plumbers 50	3.00
Stage Employes 24	10.00
Stage Employes 228	10.00
Stereotypers and Electrotypers 39	5.00
Typographical 63	25.00
Waitresses 335	5.00

WARREN

Barbers 525	2.00
Bricklayers 43	3.00
Carpenters 1438	3.00
Electrical Workers 411	2.00
Iron and Steel Workers 73	10.00
Iron and Steel Workers 91	3.00
Plumbers 225	2.00
Sheet Metal Workers 255	2.00
Stage Employes 132	5.00

WOOSTER

Barbers 546	2.00
Bricklayers 51	2.00

YOUNGSTOWN

Bakers 177	25.00
Barbers 84	5.00
Building Laborers 125	15.00
Carpenters 171	25.00
Central Body	100.00
Electrical Workers 64	8.00

Engineers 674	2.00
Letter Carriers 385	2.00
Meat Cutters 200	3.00
Painters 476	3.00
Photo Engravers 63	2.00
Plumbers 87	10.00
Printing Pressmen 205	10.00
Sheet Metal Workers 5	5.00
Stage Employes 70	5.00
Street Railway Employes 114	2.00
Street Railway Employes 272	25.00
Structural Iron Workers 207	10.00
Typographical 200	10.00

ZANESVILLE

Bricklayers 17	5.00
Carpenters 716	3.00
Fire Fighters 88	4.00
Hod Carriers 530	2.00
Plumbers 148	2.00
Street Railway Employes 809	5.00
Typographical 199	2.00

MISCELLANEOUS

Bellaire—Flint Glass Workers 34	2.00
Bridgeport—Central Body	50.00
Bryan—Bricklayers 15	5.00
Chagrin Falls — Carpenters 1643	25.00
Coshocton—Barbers 155	2.00
Crooksville—Potters 66	2.00
Dennison—Barbers 793	2.00
Fostoria—Barbers 500	2.00
Fremont—Carpenters 1166	5.00
Galion—Iron Molders 169	2.00
Geneva—Carpenters 1090	5.00
Ironton—Carpenters 1111	2.00
Lancaster—Typographical 548	2.00
Logan—Railway Carmen 629	2.00
Martins Ferry—Engineers 172	2.00
Minerva—Potters 70	5.00
New Philadelphia — Carpenters 1802	10.00
Painesville—Carpenters 404	5.00
Salem—Machinists 565	2.00
Salineville—Potters 71	2.00
Sebring—Potters 44	5.00
Shawnee—Bricklayers 258	5.00
Toronto — Iron and Steel Workers 142	10.00
Wellsville—Carpenters 405	4.00
Wellsville—Potters 24	2.00
Wapakoneta—Street Railway Employes 939	5.00
Willard—Painters 593	2.00
Willoughby—Carpenters 1174	5.00
Wheeling, W. Va. — Street Railway Employes 103	5.00
Total amount received	**$2841.45**

The financial report for the year ended June 30, 1929, follows:

Receipts

(Year July 1, 1928—June 30, 1929)

Per capita tax	$10,726.62
Annual dues	1,457.00
Affiliations	68.00
Total	$12,251.62
*Donations in response to appeal for additional funds	2,851.45
Interest from certificate of deposit	142.50
Addressing envelopes for International Glove Workers Union	5.00
Donation for Slatmyer compensation case	25.00
Reimbursement from Old Age Pension account for taxes	266.67
Reimbursement for one-half of bond premium for Year Book advertising solicitor	5.00
Total	$15,547.24
Year Book receipts	4,511.32
Gross receipts	$20,058.56

*While the amount received is stated to be $2,851.45, the actual amount received was $2,841.45. This apparent discrepancy is caused by the fact that a $10.00 check issued by Painters Union 181 was returned to us marked "signature incomplete". When the check was returned to the Union and its attention called to it, another check for $10.00 was forwarded which was accepted by the bank. As a bookkeeping proposition it was necessary to list $2,851.45 as the amount received, in view of the fact that both checks were banked and the returned check for $10.00 was charged against the Federation by the bank.

Disbursements

Convention expenses, 1928:		
Printing and mailing Proceedings	$726.24	
Printing daily proceedings	310.00	
Printing officers' reports	130.00	
Printing credentials, convention calls and attendance cards	54.00	
Credential committee	75.00	

mination to remove the departments to a safer building, but the matter dragged until the Cleveland Clinic Disaster, caused by inflammable X-ray films. As a very large number of similar films were in the files of the Industrial Commission, the hazards existing in the Hartman Hotel Building to the records of the Commission and the employees of the Labor Departments made such an impression upon the Governor that he acted almost at once. As a result, the State Labor Departments have been removed to the Pure Oil Building, which is practically fire-proof, provides more working space, and gives to the employees a large degree of comfort and safety.

Workmen's Compensation

The Legislative Report gives a detailed account of the efforts of your Secretary and President to secure improvements in the terms of the Workmen's Compensation Law and defeat objectionable amendments proposed. The strenuous campaign conducted by your Legislative Agent, other officers of the Federation and the representatives of some of the State Labor Organizations, brought little results aside from the defeat of objectionable proposals. The situation confronted by Labor during the session of the Legislature on compensation legislation was brought about largely by the inability of the joint committee of representatives of employers and labor to agree upon amendments to the Workmen's Compensation Law, and this was caused, more than anything else, by the insistent demand of the representatives of the employers that Labor agree to an amendment of Section 1465-90 of the law, whereby the right of appeal to the courts would be eliminated. As I think you know, the representatives of Labor refused to agree to such an amendment. The disagreement of the joint committee was the first to take place since such committees have been functioning over a period of years. Perhaps, in the long run, the disagreement may not be altogether without its benefits. It may be possible because of the situation created by the disagreement, in the future to meet with the representatives of the employers and agree upon other amendments which will improve the workability of the law and benefit the injured workers and dependents of killed workers in Ohio.

The members of Organized Labor in Ohio should continue to be guardians of the Ohio State Plan of Workmen's Compensation. It should also be kept in mind that it is our duty to cooperate with all real friends of the plan, while guarding the interests of Labor. Attention at this time should be called to the fact that several organizations which have not been friendly to Labor and the Ohio Plan served notice last winter that they intend to take a hand in advocating amendments to our law. There can be no doubt that our law under the State Plan will be improved from time to time, that many of Labor's complaints will be met, both as to the terms of the law and its administration, if we will all apply ourselves to the work of bringing about the desired improvements.

In passing on, it should be added, that your Legislative Agent made a serious effort to have the occupational disease terms of the law changed so as to make it inclusive of all occupational diseases and disabilities. In this he was not successful, but the effort resulted in the adding of three occupational diseases and disabilities to be compensated for. Your Legislative Agent is convinced that, if Labor persists, our compensation law will undoubtedly compensate for all occupational diseases and disabilities caused by and arising out of industry.

The Finances of the Federation

This convention will be called upon to consider the finances of the Federation by reason of the recommendation of your Executive Board, in its report to this convention, that the per capita tax be increased from one per cent per month per member to two cents per month. Your Executive Board, when considering the subject, felt that something must be done by this convention to provide the Federation with more adequate funds. Your Secretary-Treasurer was instructed to communicate with the affiliated organizations on the subject and request them to notify our headquarters as to whether they favored such increase in the per capita tax. They were further requested to instruct their delegates to this convention on the proposition. Few replies have been received. It is sincerely hoped that this convention will receive such information, and that the subject will receive the best attention and thought of the delegates, and that they will keep in mind, when considering the subject, the ability and willingness of the affiliated organizations generally to pay increased dues. Further, they should consider that it is important that whatever is done in respect to increasing the dues, should be done with the thought in mind of retaining our present membership and adding to it. If the increasing of the dues should result in any considerable loss in membership, or make it harder to add to it, wisdom would dictate that no increase take place and that the Federation continue to operate on the revenues now being received. Your Secretary is reporting to you in this manner because he is well aware that delegates to such conventions as ours, are inclined to become too optimistic and enthusiastic as to the willingness of Local Unions to pay increased dues. This should be guarded against. Finally, if the convention decides to increase the dues, such increase, in the judgment of your Secretary-Treasurer, should not go into effect until the beginning of the fiscal year July 1, 1930, and that nothing should be done which will add to the fixed overhead of our Federation until it is known what increase in our funds will take place and what the effect of such increase will be upon the membership of the Federation.

New Member of the Industrial Commission

Governor Cooper appointed, on April 6, Brother L. E. Nysewander as the Labor member of the Industrial Commission of Ohio, to succeed Brother P. F. Casey, whose term expired on June 30, 1929.

The appointment of Brother Nysewander should be pleasing to Labor, as he has been a member of Carpenter's Union No. 104, of Dayton, for a number of years, an officer of the State Council of Carpenters, and possesses the ability to fill the position acceptably to all. His experience in the Trade Union Movement and with the handling of compensation claims while an officer of his Local Union for members of the Union are assets which will be of much benefit to him and the workers in his new position, is the belief of your Secretary-Treasurer.

The Grim Reaper

During the past year several active Trade Unionists known to the delegates attending the conventions of the Ohio State Federation of Labor have passed away. Among this number was Brother Henry Ott, of Cincinnati. Brother Ott passed away on May 7 in St. Mary's Hospital, Cincinnati, following a heart attack. He was 62 years of age. Brother Ott was one of the best known Trade Unionists in Ohio, having attended the conventions of our Federation for a number of years as a delegate and serving the Federation as President from 1905 to 1907. In addition to this, he was one of the charter members of the present Federation, following the revocation of the charter of the Ohio Federation of Labor during the 1909 convention thereof. Brother Ott had been a member of Organized Labor for 38 years. Your Secretary attended the funeral of Brother Ott and a suitable floral piece was provided by the Federation.

Donations in Response to Appeals for Funds

Ohio State Conference of Bricklayers	$ 25.00
Boot and Shoe Workers' Joint Council No. 16, Cincinnati	5.00
Joint Board of Ladies' Garment Workers of Cleveland	15.00
Youngstown Building Trades Council	25.00
AKRON	
Bricklayers 7	10.00
Carpenters 212	10.00
Central Body	25.00
Electrical Workers 306	2.00
Engineers 561	2.00
Iron Molders 30	3.00
Machinists 203	2.00
Musicians 24	10.00
Plumbers 219	3.00
Stage Employees 48	5.00
ALLIANCE	
Carpenters 1023	5.00
Central Body	5.00
Iron Molders 307	3.00
Machinists 22	5.00
Plasterers 499	2.00
Plumbers 427	10.00
Stage Employes 48	5.00

Figure A-4: The Climate Divisions of the U.S. and the Buffer Zone around Dallas

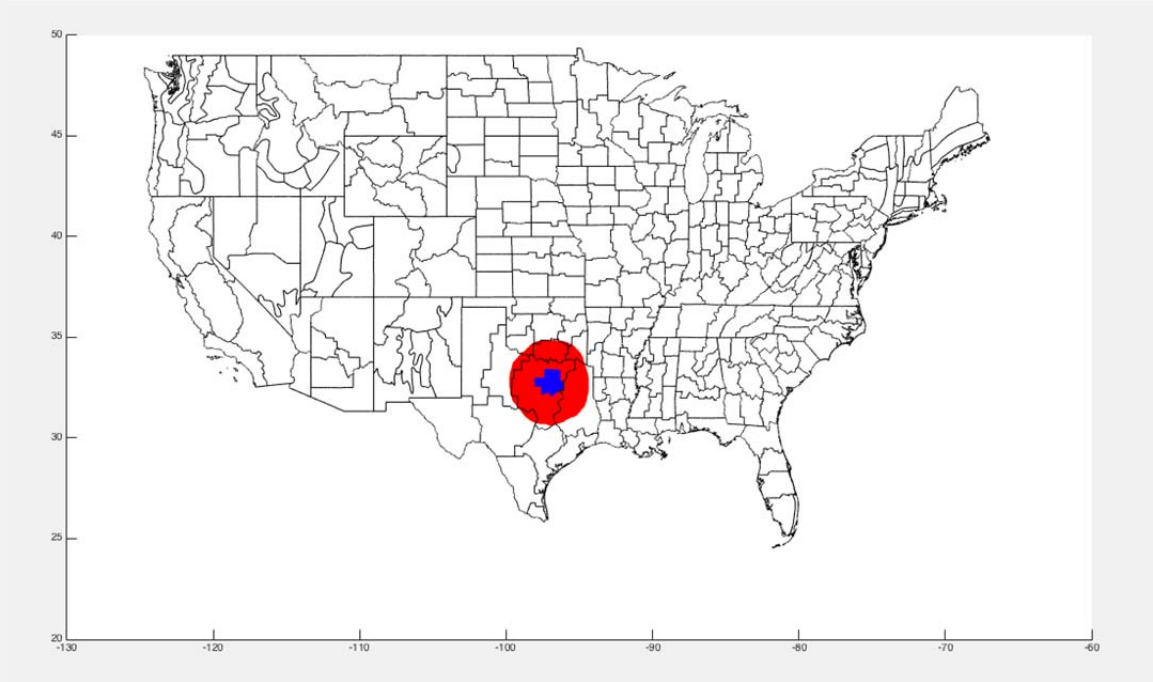


Figure A-5: Internal Migration From 1935 to 1940 for Boston

Table 18.—MIGRATION CHARACTERISTICS OF THE 1940 POPULATION AND OUT-MIGRANTS, 1935 TO 1940, BY AGE AND SEX, FOR CITIES OF 500,000 OR MORE (WITH NONWHITE FOR SELECTED CITIES)—Continued

(Figures for nonwhite shown separately for cities having 5,000 or more nonwhite in-migrants or out-migrants)

AREA, MIGRATION CHARACTERISTICS, COLOR, AND SEX	Total	Under 5 years	5 to 13 years	14 to 17 years	18 and 19 years	20 to 24 years	25 to 29 years	30 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65 years and over
BOSTON—MALE												
1940 Population												
The city, 1940	573,147	25,261	52,104	25,525	13,192	31,945	30,995	28,855	54,738	50,174	34,121	28,457
Nonmigrants	547,933	25,261	49,511	24,581	12,400	28,826	27,192	25,469	49,839	47,104	32,453	25,490
In-migrants	20,689	-	2,198	766	635	2,854	3,229	2,677	4,011	2,452	1,263	828
Urban, 1935	17,712	-	1,941	679	498	2,095	2,781	2,363	3,497	2,106	1,085	667
Rural-nonfarm, 1935	1,604	-	147	51	83	312	236	153	264	183	115	80
Rural-farm, 1935	290	-	12	15	22	75	54	26	40	32	18	16
Rural, no report on farm or nonfarm, 1935	684	-	75	18	24	103	110	79	116	75	45	41
No report on urban-rural, 1935	399	-	25	5	8	49	68	54	94	56	20	22
From balance of State	11,735	-	1,524	538	342	1,311	1,655	1,466	2,135	1,398	797	589
Urban, 1935	10,539	-	1,392	489	286	1,143	1,616	1,341	1,941	1,233	698	502
Rural-nonfarm, 1935	753	-	84	31	36	115	84	75	117	107	68	36
Rural-farm, 1935	72	-	5	5	5	17	5	4	10	10	6	5
Rural, no report on farm or nonfarm, 1935	340	-	42	13	14	53	49	43	59	38	24	25
No report on urban-rural, 1935	31	-	1	-	1	3	1	3	8	10	3	1
From contiguous States	4,220	-	345	109	128	547	655	603	941	514	285	157
Urban, 1935	3,504	-	298	88	103	426	518	517	805	457	210	102
Rural-nonfarm, 1935	339	-	23	14	14	64	51	33	87	36	26	11
Rural-farm, 1935	67	-	1	3	4	13	11	8	10	8	5	4
Rural, no report on farm or nonfarm, 1935	157	-	9	1	4	27	26	15	17	16	14	8
No report on urban-rural, 1935	173	-	14	3	1	17	27	30	42	17	10	12
From noncontiguous States	4,754	-	327	119	167	776	941	808	935	540	201	130
Urban, 1935	3,669	-	251	102	109	526	747	505	751	436	159	83
Rural-nonfarm, 1935	512	-	40	6	33	133	101	45	80	40	21	13
Rural-farm, 1935	151	-	8	5	13	45	16	16	20	14	7	7
Rural, no report on farm or nonfarm, 1935	207	-	22	4	8	45	55	21	40	21	7	8
No report on urban-rural, 1935	195	-	8	2	6	29	40	21	44	29	7	9
Immigrants	1,565	-	151	96	84	216	234	190	298	165	88	43
Migration status not reported	2,992	-	246	82	73	270	340	319	590	455	317	270
Out-migrants to Other Areas, 1935 to 1940												
Resident in the city, 1935	43,720	-	5,575	1,868	1,079	3,633	6,524	6,814	9,147	4,915	2,443	1,722
Urban, 1940	35,920	-	4,560	1,581	833	2,854	5,503	5,768	7,742	3,984	1,940	1,355
Rural-nonfarm, 1940	6,589	-	787	314	217	688	900	920	1,247	786	424	306
Rural-farm, 1940	1,211	-	228	163	29	91	121	126	158	145	79	71
To balance of State	26,710	-	4,052	1,567	885	1,854	3,318	4,088	5,682	3,106	1,522	1,106
Urban, 1940	22,869	-	3,577	1,008	552	1,533	2,928	3,550	4,976	2,598	1,248	903
Rural-nonfarm, 1940	3,441	-	499	225	99	295	357	463	638	442	243	180
Rural-farm, 1940	400	-	156	124	12	26	35	55	68	68	31	25
To contiguous States	7,124	-	649	208	184	740	1,331	1,172	1,479	774	358	229
Urban, 1940	5,574	-	481	139	159	561	1,089	960	1,187	595	289	154
Rural-nonfarm, 1940	1,250	-	131	49	17	144	204	185	247	135	64	44
Rural-farm, 1940	300	-	37	20	8	35	38	27	45	44	25	21
To noncontiguous States	9,886	-	894	293	232	1,039	1,875	1,574	1,986	1,035	563	395
Urban, 1940	7,477	-	702	234	142	780	1,486	1,258	1,579	793	443	298
Rural-nonfarm, 1940	1,898	-	157	40	81	249	339	272	362	209	117	74
Rural-farm, 1940	311	-	35	19	9	30	48	44	45	33	23	23