

# THE MINNEAPOLIS MINIMUM WAGE INCREASE

## BASELINE REPORT \*

Loukas Karabarbounis      Jeremy Lise      Anusha Nath

September 1, 2018

### **Abstract**

The baseline report describes economic indicators for the city of Minneapolis, the broader metro area, Hennepin county, and the state of Minnesota in years preceding the increase in the Minneapolis minimum wage. We document trends in a variety of local and regional outcomes such as employment, unemployment, wages, number of establishments, worker turnover rates, business sales, and income and consumption. Our analysis also provides estimates of the fraction of workers in Minneapolis who are potentially affected by the minimum wage increase. We disaggregate economic outcomes by industry, occupation, type of firms and workers, and place of residence and work.

---

\*Karabarbounis: University of Minnesota, Federal Reserve Bank of Minneapolis, and NBER; email: loukas@umn.edu. Lise: University of Minnesota and Federal Reserve Bank of Minneapolis; email: jlise@umn.edu. Nath: Federal Reserve Bank of Minneapolis; email: anusha.nath@mpls.frb.org. This report has been commissioned by the City of Minneapolis. Karabarbounis and Lise thank the Opportunity and Inclusive Growth Institute at the Federal Reserve Bank of Minneapolis for hosting them. The views expressed herein are those of the authors and not necessarily those of the Federal Reserve Bank of Minneapolis or the Federal Reserve System.

# Contents

<b>1</b>	<b>Executive Summary</b>	<b>1</b>
<b>2</b>	<b>Trends in Economic Indicators</b>	<b>5</b>
2.1	Employment . . . . .	5
2.2	Unemployment . . . . .	13
2.3	Wages and Earnings . . . . .	14
2.4	Turnover Rates . . . . .	22
2.5	Establishments and Firms . . . . .	25
2.6	Business Sales . . . . .	31
2.7	Income and Consumption . . . . .	33
<b>3</b>	<b>Trends in Restaurant Services</b>	<b>35</b>
<b>4</b>	<b>Workers Affected by the Minimum Wage Increase</b>	<b>37</b>
4.1	Demographics . . . . .	38
4.2	Industries . . . . .	40
4.3	Occupations . . . . .	42
<b>5</b>	<b>Data Requirements for Future Reports</b>	<b>44</b>

# 1 Executive Summary

The minimum wage increased to 10 dollars per hour for large businesses on January 2018. It will increase gradually and reach 15 dollars per hour by July 2022 for larger businesses and by July 2024 for smaller businesses. The City of Minneapolis commissioned a study of the impacts of the increase in the minimum wage on workers, businesses, and consumers. The principal investigators of the study, hosted by the Opportunity and Inclusive Growth Institute at the Federal Reserve Bank of Minneapolis, are providing to the City of Minneapolis a baseline report establishing trends in various economic indicators between 2000 and 2017 for the city of Minneapolis, neighboring areas and counties, and the state of Minnesota. We summarize key results of our analysis.

1. Employment growth has been strong in Minneapolis since the early 2010s and employment has now reached levels higher than in the early 2000s.

(a) Industries with faster employment growth:

- Accommodation and food services.
- Education.
- Health.
- Professional, scientific, and technical services.

(b) Industries with slower employment growth:

- Information.
- Manufacturing.
- Wholesale.

(c) Groups of workers with faster employment growth:

- Low educated workers.
- Older workers.

- Workers who identify as Asian.
  - Workers who identify as Black or African-American.
  - Workers who identify as Latino or Hispanic.
- (d) Groups of workers with slower employment growth:
- Younger workers.
  - Workers who identify as White.
2. Real wage growth has been relatively steady in Minneapolis since the 2000s.
- (a) Industries with faster wage growth:
- Professional, scientific, and technical services.
  - Wholesale.
- (b) Industries with slower wage growth:
- Education.
  - Health.
  - Manufacturing.
  - Retail.
- (c) Groups of workers with faster wage growth:
- Low educated workers.
  - Older workers.
  - Workers who identify as Asian.
  - Workers who identify as White.
- (d) Groups of workers with slower wage growth:
- Younger workers.
  - Workers who identify as Black or African-American.

3. Worker turnover (hires and separations) rates have declined since 2000.

(a) Groups of workers with higher turnover levels:

- Low educated workers.
- Younger workers.
- Workers in the accommodation and food, administrative services, and recreation industries.
- Workers who identify as Black or African-American.
- Workers who identify as Latino or Hispanic.

(b) Groups of workers with lower turnover levels:

- High educated workers.
- Older workers.
- Workers in the manufacturing and utilities industries.
- Workers who identify as White.

4. The number of establishments has declined since 2000.

(a) Industries with significant declines in their number of establishments:

- Finance and insurance.
- Manufacturing.
- Wholesale.

(b) Industries with significant increases in their number of establishments:

- Accommodation and food services.
- Health.

5. Consumers in the Minneapolis, Saint Paul, and Bloomington metro area have shifted their consumption baskets away from apparel, tobacco, and alcohol toward health and education relative to the early 2000s.

6. We estimate that, if nothing else changed, 16 percent of all workers in Minneapolis, or roughly 52,000 workers, would earn a wage below 115 percent of the increased minimum wage in 2018. We estimate that 24 percent of all workers in Minneapolis, or roughly 78,000 workers, would earn a wage below 115 percent of the increased minimum wage by 2023.
  
7. We identify the groups with more than 50 percent of workers who would earn a wage below 115 percent of the increased minimum wage by 2023:
  - Workers with less than high school education.
  - Workers younger than 25 years old.
  - Workers in the administrative services industry.
  - Workers in the restaurant industry.
  - Workers in the occupations of food preparation, serving, and bartending.
  - Workers in retail sales and cashiers.
  - Workers in the occupations of waiting, dishwashing, and hosting.
  
8. Main challenges constraining future analyses of the effects of the minimum wage on the local economy:
  - Lack of access to sales and income data at the business level from sales and corporate tax forms. These data are available from the Minnesota Department of Revenue (DOR), but they have not been made available to us due to ongoing confidentiality concerns raised by the DOR.
  - Lack of quality data on consumption.
  - Lack of quality data on prices.



Figure 1: Employment in Minneapolis, Thousands of Jobs

## 2 Trends in Economic Indicators

In this section we present our analyses of trends in various economic indicators for the city of Minneapolis, neighboring areas and counties, and the state of Minnesota. We draw on a large number of publicly available data sources to document trends in employment, unemployment, wages, number of establishments, worker turnover rates, business sales, personal income, and consumption. We disaggregate these trends by industry, occupation, type of worker, and type of firms.

### 2.1 Employment

We begin our analyses by documenting employment (number of jobs) trends in the city of Minneapolis and neighboring areas. The source data come from the Quarterly Census of Employment and Wages (QCEW). The QCEW is a census of employers. The measure of employment refers to the number of workers who worked during or received pay for a pay period that includes the 12th of the month as reported by establishments covered under the unemployment insurance program. According to the QCEW, these jobs account for roughly

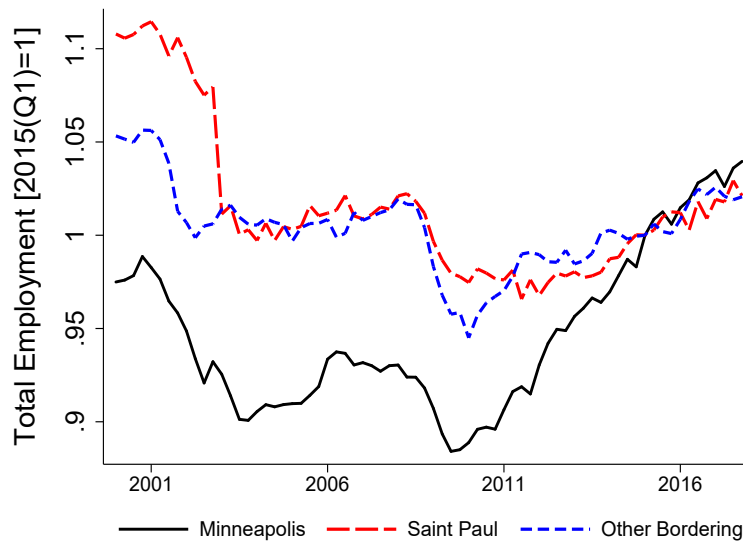


Figure 2: Employment Index, 2015(1) = 1

97 percent of employment in the state of Minnesota. Most of the excluded employment comes from the self-employed. Employment covers all industries, including the public sector.

Figure 1 presents the evolution of employment in Minneapolis between 2000 and 2017. Employment in Minneapolis during the 2000s largely followed national employment, declining during the economic downturns of 2001 and 2007 and recovering in between. Since 2010, Minneapolis has added jobs at an annual rate of roughly 2.5 percent, for a total of roughly 45,000 additional jobs.<sup>1</sup>

In Figure 2 we plot employment in the city of Minneapolis together with employment in the city of Saint Paul and in other neighboring cities excluding Saint Paul.<sup>2</sup> All series in the figure have been normalized to one in the first quarter of 2015 to better visualize employment growth for cities with different employment levels. Figure 2 displays important differences

<sup>1</sup>We seasonally adjust the raw employment series from the QCEW by regressing raw employment on quarterly dummies and then subtracting the estimated coefficient on the quarterly dummy from raw employment. The resulting employment series is then normalized to have the same mean as the raw series over the sample period. Unless otherwise noted, all time series described in this report are seasonally adjusted using the same methodology.

<sup>2</sup>In other neighboring cities we include Brooklyn Center, Columbia Heights, Edina, Falcon Heights, Fort Snelling, Fridley, Golden Valley, Lauderdale, Richfield, Robbinsdale, Roseville, Saint Anthony, and Saint Louis Park.



across the three groups of cities. Between 2000 and 2015, Minneapolis has gained jobs whereas neighboring cities have lost jobs.<sup>3</sup> However, all cities have experienced job growth since 2015, although Minneapolis by a somewhat higher rate.

In Table 1 we present summary statistics of the 2017 composition of employment across industries in the state of Minnesota, Hennepin county, the city of Minneapolis, and the city of Saint Paul.<sup>4</sup> We note the relative similarity of employment shares between Minneapolis and Saint Paul. Notably, in both cities health is the largest industry and educational, financial, and professional services absorb a large share of jobs. A difference between the two cities is in the size of their public sector, which accounts for 13 percent of employment in Saint Paul as opposed to roughly 5 percent in Minneapolis. Importantly, retail, administrative services, and accommodation and food services collectively account between 17 and 18 percent of all jobs in both cities.<sup>5</sup> As we show in Section 4.2 these three are the industries with the largest share of workers earning wages below the projected increase in the minimum wage.

Figure 3 displays employment trends for various industries in Minneapolis alongside with total employment (solid line). We again normalize employment to one in the first quarter of 2015 for each industry to better visualize difference in growth rates across industries. Among the most important trends, we note the prolonged decline in manufacturing employment and the rise of employment in health, education, and accommodation and food services. These trends for Minneapolis accord well with the corresponding employment trends at the national level.<sup>6</sup> On the other hand, the employment declines in wholesale and retail trade contrast with their relative stability at the national level over the same period.

---

<sup>3</sup>Employment in Saint Paul declined by 13,500 jobs in 2003. More than 10,000 jobs were lost only in the management industry (NAICS code 55). We suspect but cannot fully confirm that this decline is related to the merger of the major insurance provider St. Paul Companies Inc. with Travelers Companies.

<sup>4</sup>From all our analyses in this report, we exclude agriculture and mining and, therefore, the shares may sum up to below 100 percent.

<sup>5</sup>Administrative services (NAICS code 56) include office, buildings, and facilities support services, employment agencies services, various business support and temporary help services, and waste management services.

<sup>6</sup>The prolonged decline in U.S. manufacturing employment has been linked to increased import competition from China (Autor, Dorn, and Hanson, 2013) and the automation of production (Acemoglu and Restrepo, 2017).

Table 1: Industry Shares of Employment (2017)

(percent of area total)	Minnesota	Hennepin	Minneapolis	Saint Paul
Utilities	0.5	0.4	0.9	0.5
Construction	4.4	3.2	2.2	2.7
Manufacturing	11.2	8.1	4.1	4.2
Wholesale	4.6	5.0	2.5	3.1
Retail	10.5	8.6	4.8	5.3
Transportation	3.7	3.9	2.4	1.3
Information	1.9	2.2	3.2	2.7
Finance and Insurance	5.0	7.6	9.9	6.8
Real Estate	1.2	1.8	1.4	1.3
Prof., Sc., and Tech.	5.6	10.1	11.6	4.1
Management	2.8	5.1	5.2	2.7
Administrative Services	4.7	6.4	4.4	5.2
Education	8.0	6.8	10.3	9.9
Health	17.1	15.5	18.8	24.9
Arts and Entertainment	1.8	1.8	2.0	2.1
Acc. and Food Services	8.1	7.6	8.6	6.8
Other Services	3.2	3.0	3.1	3.7
Public Administration	4.6	2.9	4.7	12.9

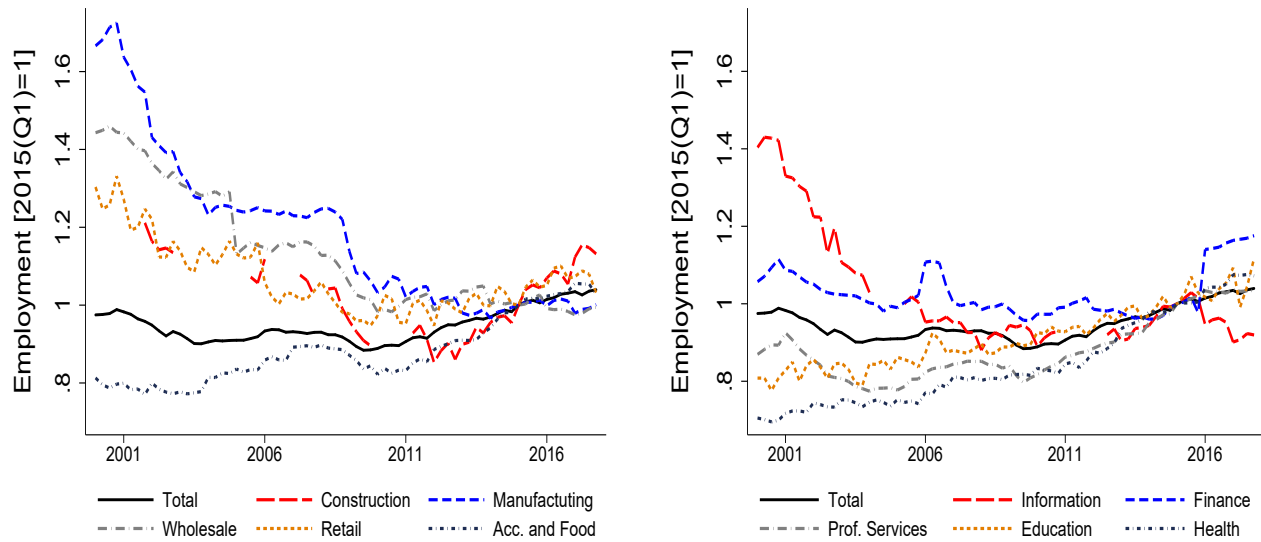
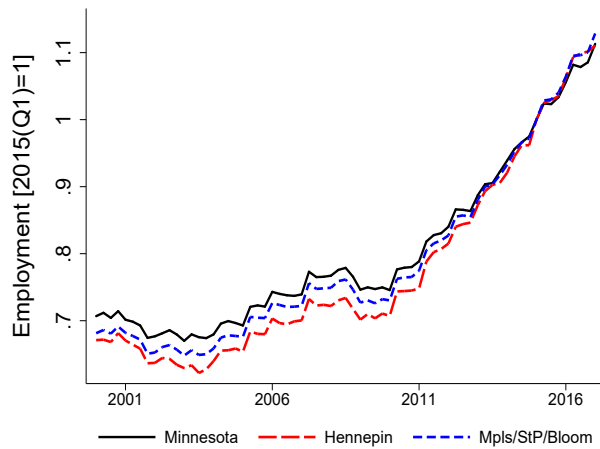
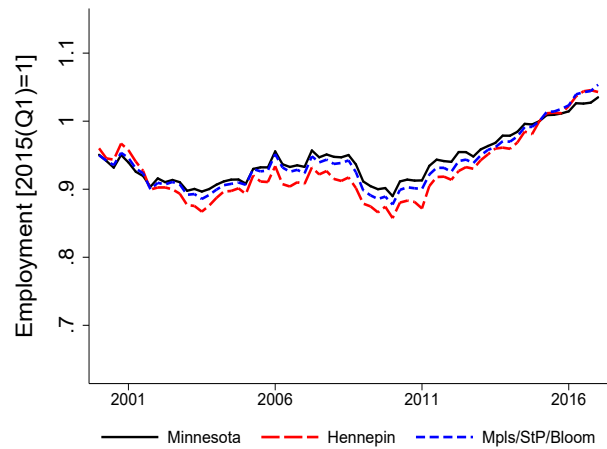


Figure 3: Employment Index in Minneapolis Across Industries,  $2015(1) = 1$

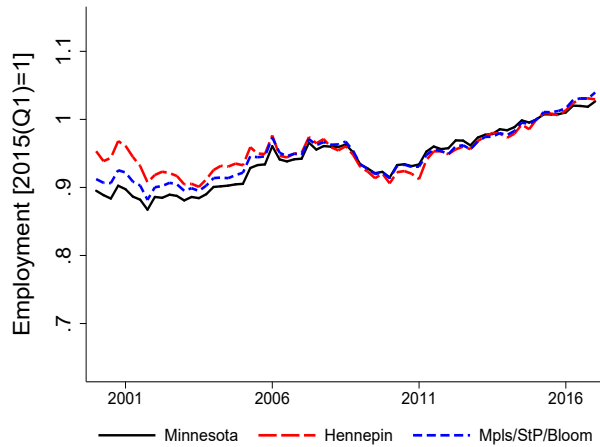
We next analyze employment trends across different groups of workers. For these analyses, we use data from the Quarterly Workforce Indicators (QWI). Unlike the QCEW that uses establishment records, the advantage of the QWI is that the source data are job-level data that link workers to their employers. This makes an analysis of employment of workers with different characteristics feasible. The disadvantage of the QWI is that publicly available labor market statistics come at a level that is more aggregated than the city of Minneapolis. For these analyses, therefore, we look at the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington. To confirm that these data are useful for our purposes, we have compared Minneapolis employment levels and changes from the QCEW at both the aggregate and the industry level to their analogs for the three regions in the QWI. While differences may exist, the general trends we have documented before in the QCEW for Minneapolis are not significantly different in the QWI for the broader geographical regions that include Minneapolis. This makes us confident that the worker-level analysis we perform with the QWI for this baseline report can be informative for worker-level labor outcomes in



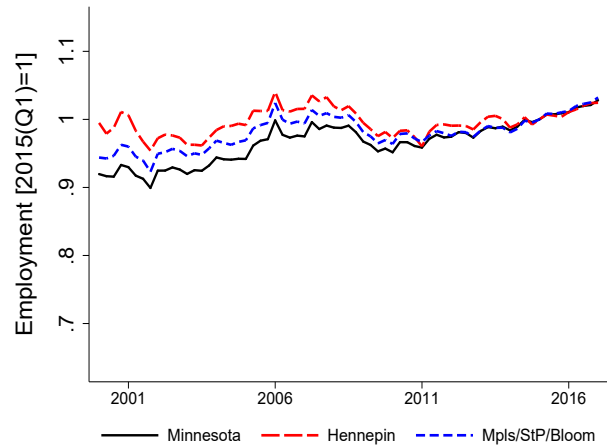
(a) Less than high school



(b) High school



(c) Some college

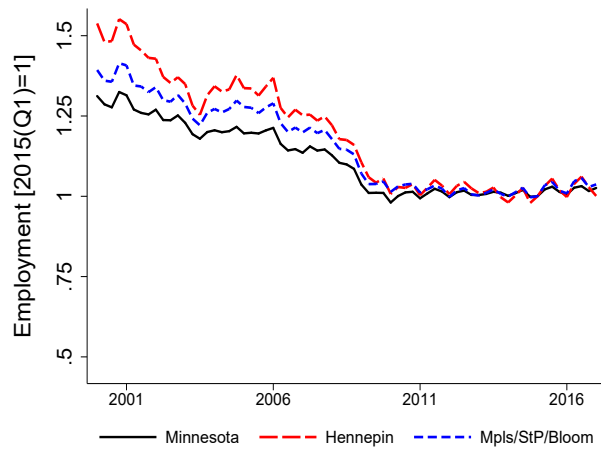


(d) College or more

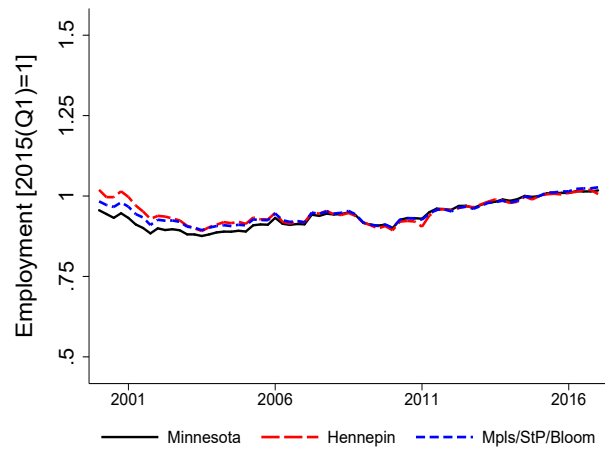
Figure 4: Employment Index Across Education Groups, 2015(1) = 1

Minneapolis.

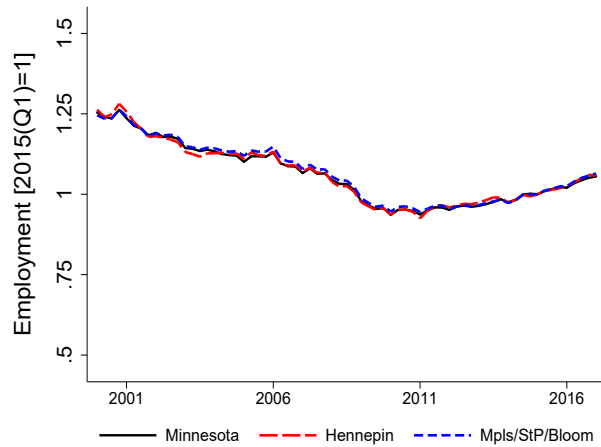
In Figure 4 we present employment trends for the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington across workers with different education levels. While employment levels by education generally move in the same direction, we observe that workers with less than high school (in the upper left panel) have experienced significantly higher employment growth both during the 2000s and especially after 2011.



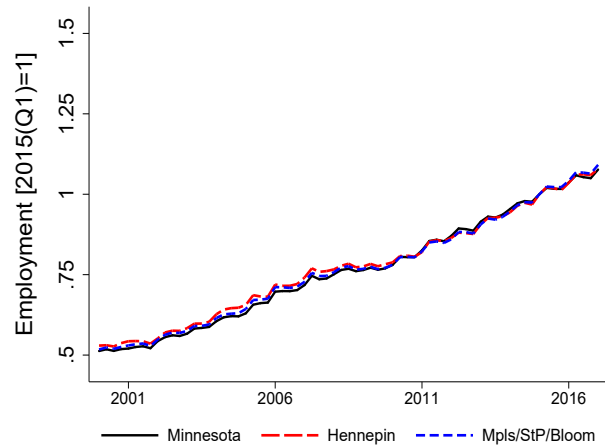
(a) Workers age 19-21



(b) Workers age 25-34



(c) Workers age 35-44



(d) Workers age 55-64

Figure 5: Employment Index Across Age Groups, 2015(1) = 1

In Figure 5 we present employment trends for the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington across workers that belong to different age groups.<sup>7</sup> Unlike our analysis based on education, here we observe some more striking differences across groups. First, groups of younger workers have experienced declines in their employment over time. At the same time, older workers (in the bottom right

<sup>7</sup>We omit from the presentation of our results workers with age between 45 and 54. The employment of these workers increased in the 2000s and remained relatively stable in the 2010s. The real wage of these workers increased over time, similarly to the real wage of workers in the 55-64 age group.

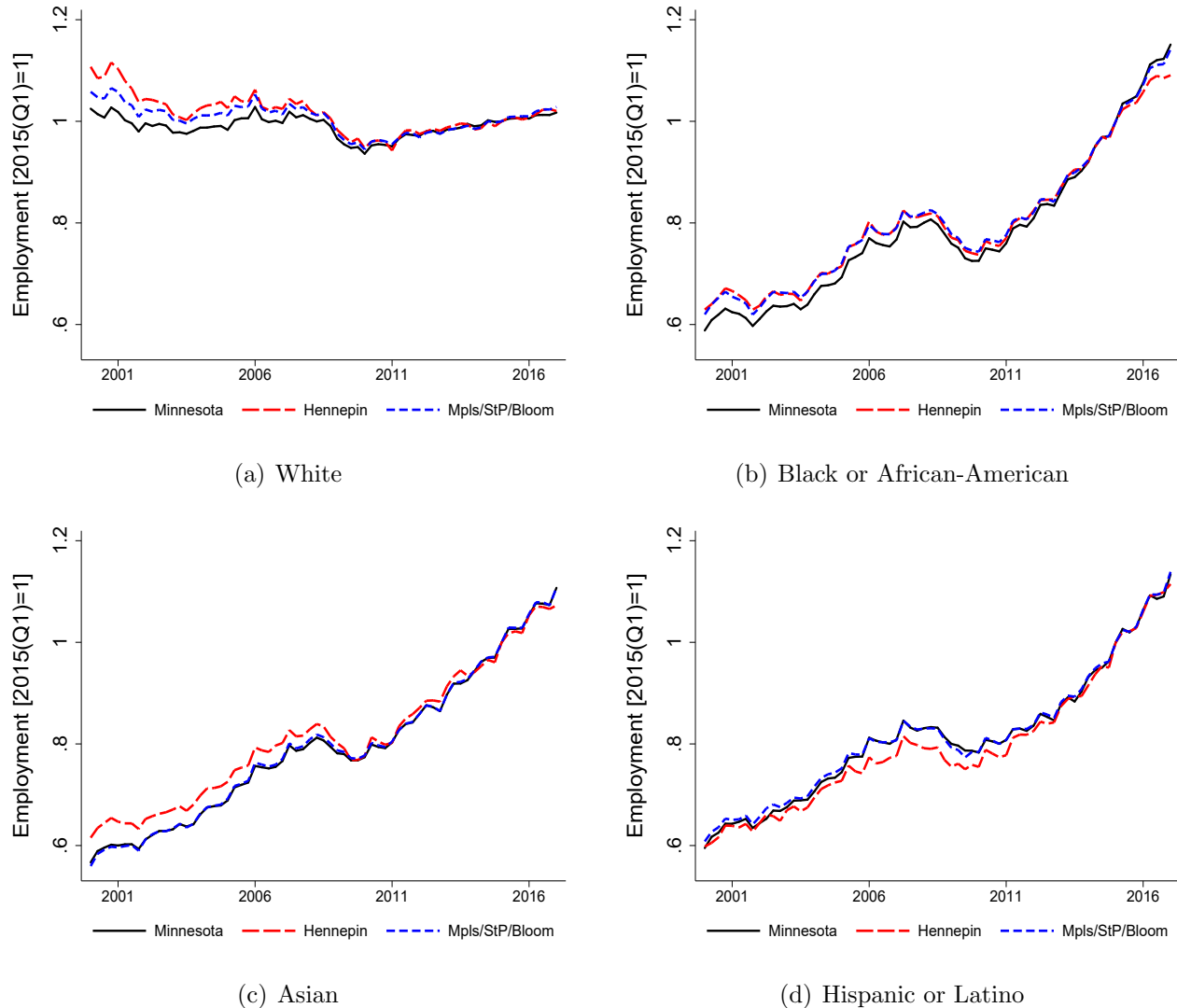


Figure 6: Employment Index Across Racial and Ethnic Groups, 2015(1) = 1

panel) have increased their employment over time. These findings for the state, the county, and the metro area are consistent with the trends documented elsewhere at the national level.<sup>8</sup> Second, most age groups have experienced employment gains after the Great Recession, with the important exception of the youngest age group (displayed in the upper left panel).

In Figure 6 we present employment trends for the state of Minnesota, Hennepin county, and

<sup>8</sup>While some of these trends reflect the demographic transition towards older populations, Aguiar, Bills, Charles, and Hurst (2017) have shown that the employment rate of younger workers is lower in the 2010s than it was in the 2000s.

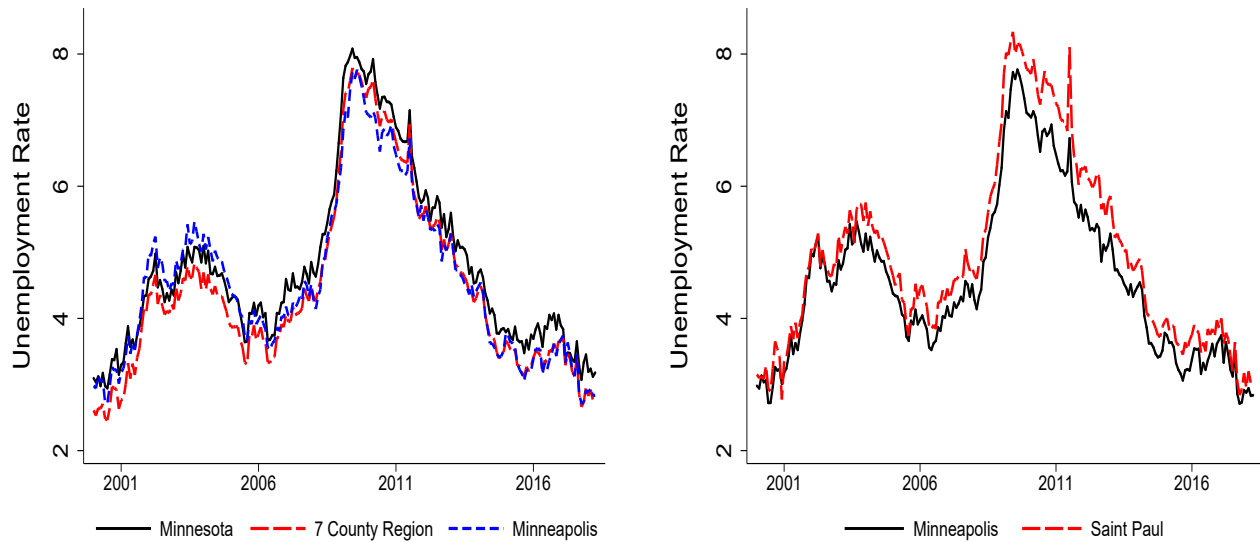


Figure 7: Unemployment Rate, Percent

the combined metro of Minneapolis, Saint Paul, and Bloomington for workers of different race and ethnicity. We find significant employment gains throughout the sample period and for all regions for workers who identify as Black or African-American, Asian, and Latino or Hispanic. By contrast, workers who identify as White experienced declining employment during the 2000s followed by a modest recovery in the 2010s.

## 2.2 Unemployment

Figure 7 presents the (seasonally-adjusted) unemployment rate for selected regions between 2000 and 2018. The source data come from the Local Unemployment Area Statistics (LAUS), a federal-state cooperative program between the U.S. Bureau of Labor Statistics (BLS) and state agencies.<sup>9</sup> The unemployment rate is calculated as the ratio of the unemployed to labor

<sup>9</sup>Monthly estimates of unemployment and employment at the state level are developed based on a state space model that uses data from the Current Population Survey, the Current Employment Statistics, and the Unemployment Insurance Statistics. The state unemployment rate determines eligibility for unemployment insurance benefits. See Chodorow-Reich and Karabarbounis (2016) for more details on the state space models and the noise that this model may introduce in determining eligibility into benefits at the state level. We note that the LAUS program imputes unemployment at the local level using state-level information and, therefore, some of the comovement between local unemployment rates may be mechanical.

force participants. Unemployed refers to persons on temporary layoff, waiting to report for a new job, or not employed but available for work and actively looking during the last four weeks, whereas labor force participants refers to the sum of the employed and unemployed. The left panel plots the unemployment rate for the state of Minnesota, the 7 county region, and the city of Minneapolis.<sup>10</sup> The right panel displays the unemployment rate for the city of Minneapolis and the city of Saint Paul. The unemployment rates comove closely across all regions during both economic expansions and downturns.

### 2.3 Wages and Earnings

We begin our analysis of wages using data from the QCEW. Average weekly wages in QCEW equal quarterly total payroll divided by 13 times the average of the three monthly employment levels. Included in the quarterly payroll data are non-wage cash payments such as bonuses, the cash value of meals and lodging when supplied, tips and other gratuities, and employer contributions to certain deferred compensation plans such as 401(k) plans and stock options. Wages measured by the QCEW are subject to large fluctuations due to calendar effects resulting from some quarters having more pay dates than others. For this reason we remove wage seasonality and smooth the series by constructing a four-quarter moving average.

In Figure 8 we plot the real wage in the city of Minneapolis, the city of Saint Paul, and other neighboring cities excluding Saint Paul. Wages are deflated using the semi-annual consumer price index for all urban consumers and all items in the Minneapolis, Saint Paul, and Bloomington metro area from the BLS. Similar to our analyses of employment across cities, all series in the figure have been normalized to one in the first quarter of 2015 to better visualize differences in the wage growth across areas. Figure 8 shows important differences in the evolution of the real wage across the three areas early in the sample. However, all areas have experienced similar real wage growth since 2005.<sup>11</sup>

---

<sup>10</sup>The 7 county region includes the counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington and covers a population of roughly 3 million.

<sup>11</sup>The notable drop in wages in Saint Paul in the early 2000s coincides with the drop in employment that we



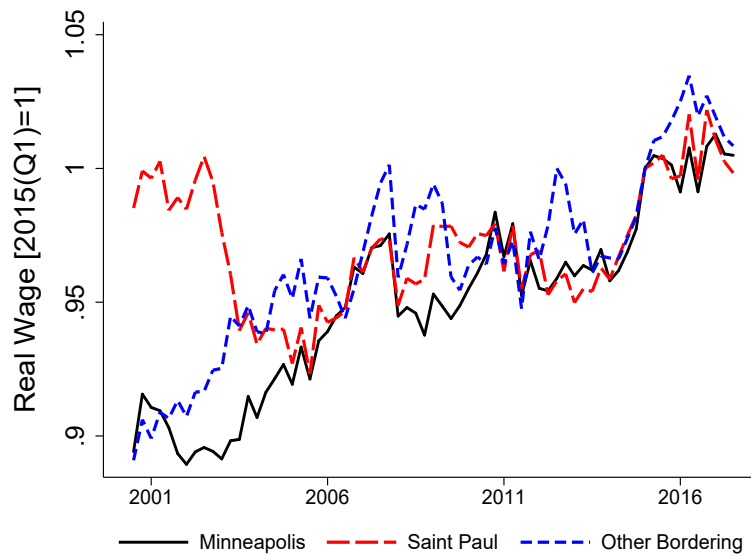


Figure 8: Real Wage Index, 2015(1) = 1

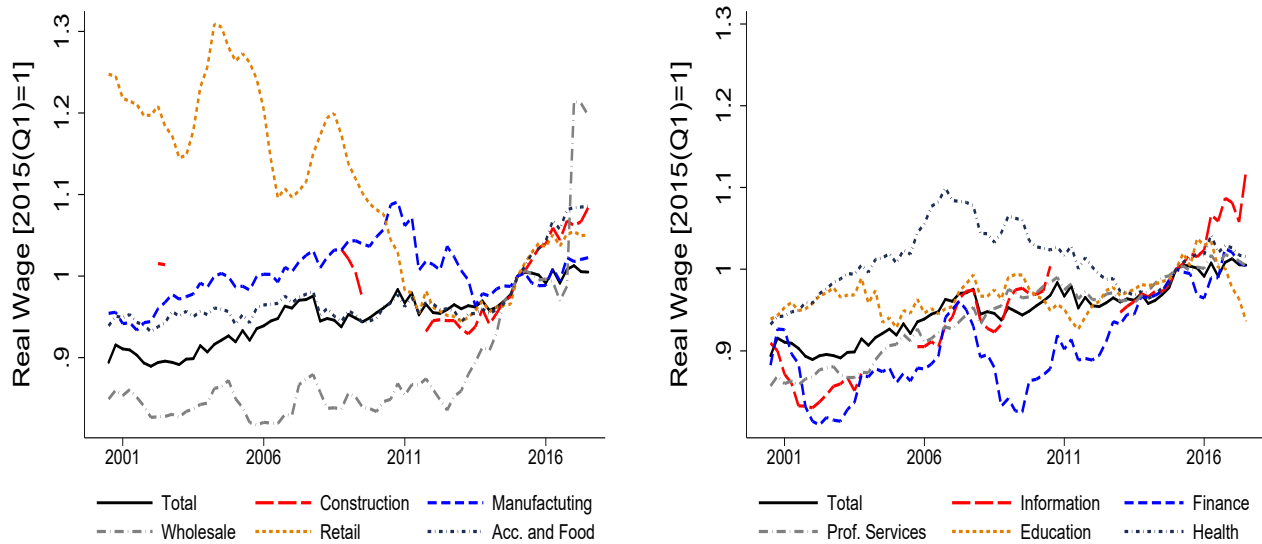


Figure 9: Real Wage Index in Minneapolis Across Industries, 2015(1) = 1

Figure 9 displays trends in wages in Minneapolis for various industries between 2000 and 2017. The solid lines display a relative steady increase of wages over time for the city as a whole. However, not all industries experienced similar trends. Most notably, the retail industry noted previously in footnote 3.

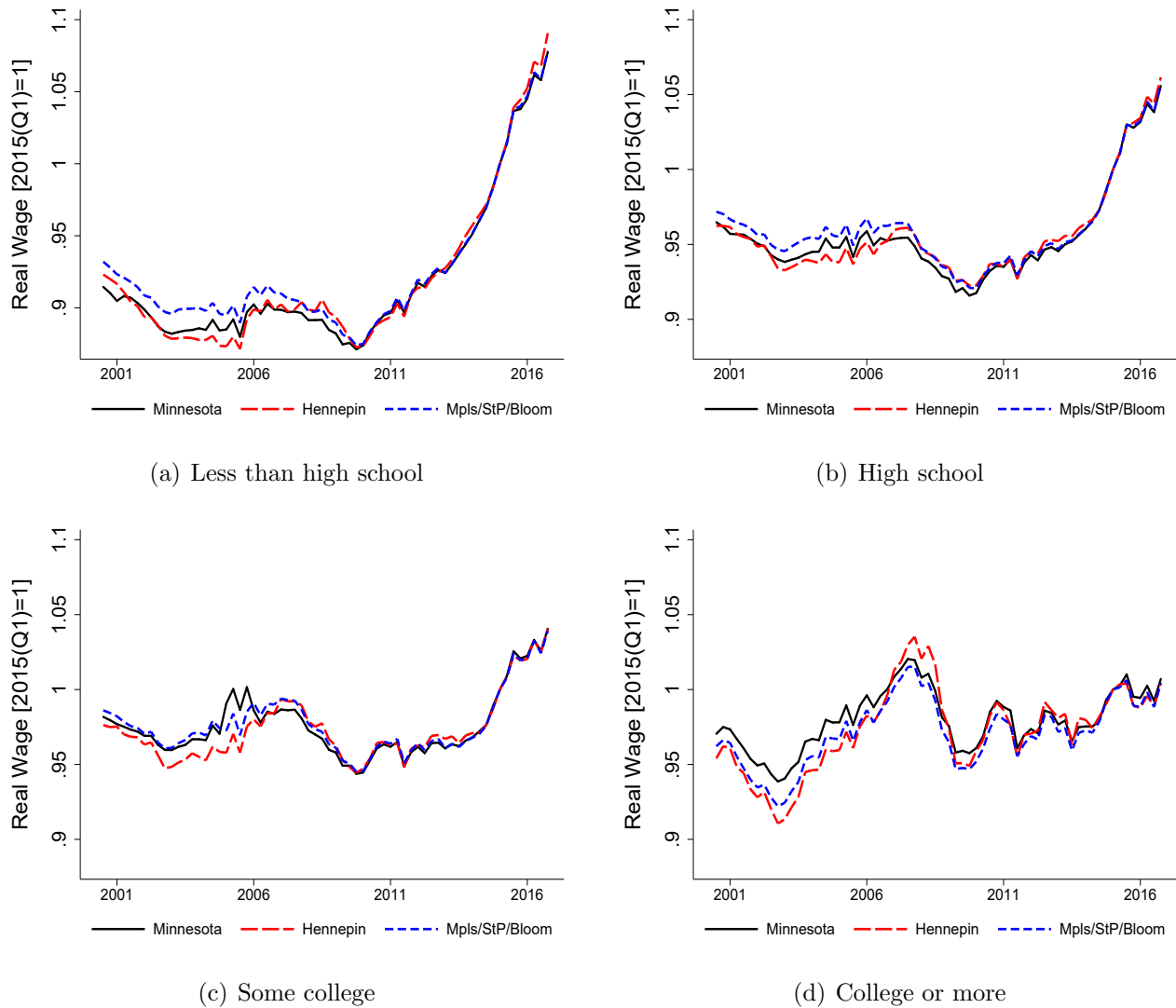
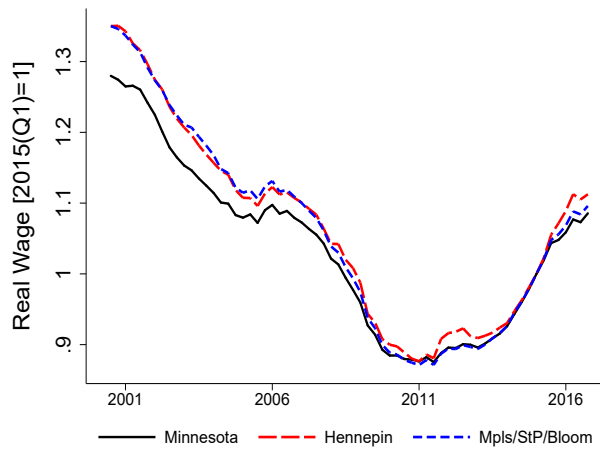


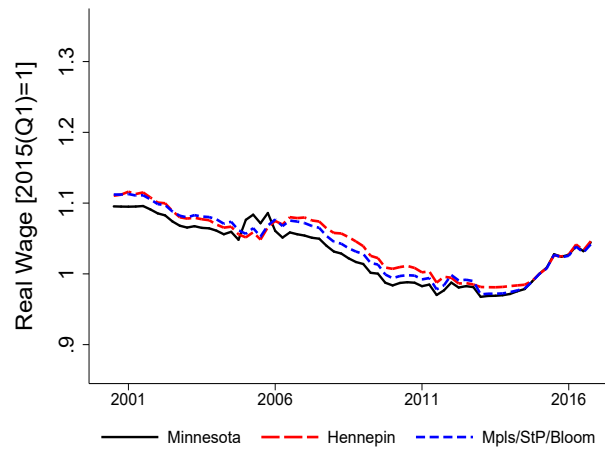
Figure 10: Real Wage Index Across Education Groups, 2015(1) = 1

in the left panel has exhibited a large prolonged decline in wages over the 2000s before slightly recovering in the 2010s. On the other hand, wholesale (in the left panel) and finance (in the right panel) have experienced significant wage growth during the 2010s.

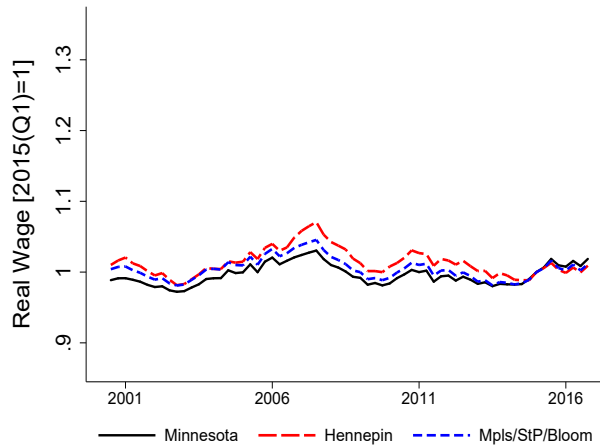
We now analyze real wage trends across different groups of workers. Similar to our analyses of employment trends by group of workers, for this analysis we use data from the QWI that link workers to their employers and allow us to document wage trends for workers with different characteristics. In Figure 10 we present wage trends for the state of Minnesota, Hennepin



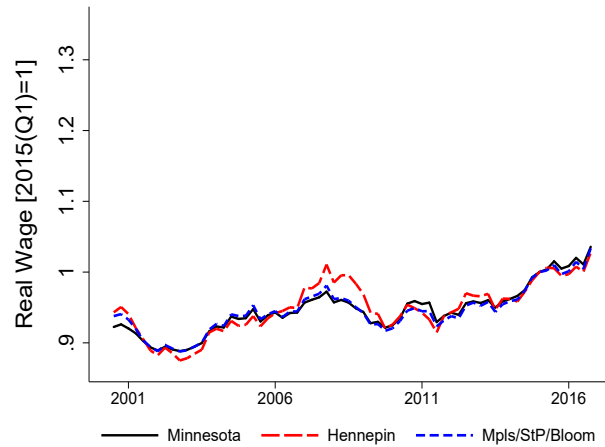
(a) Workers age 19-21



(b) Workers age 25-34



(c) Workers age 35-44



(d) Workers age 55-64

Figure 11: Real Wage Index Across Age Groups, 2015(1) = 1

county, and the combined metro of Minneapolis, Saint Paul, and Bloomington across workers with different education levels. After a decade of stable or declining real wage, non-college educated workers have experienced the highest wage growth in the 2010s. Workers with a college degree have experienced more modest gains.

In Figure 11 we present real wage trends for the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington across workers that belong to different age groups. Mirroring their employment trends, younger groups of workers (in

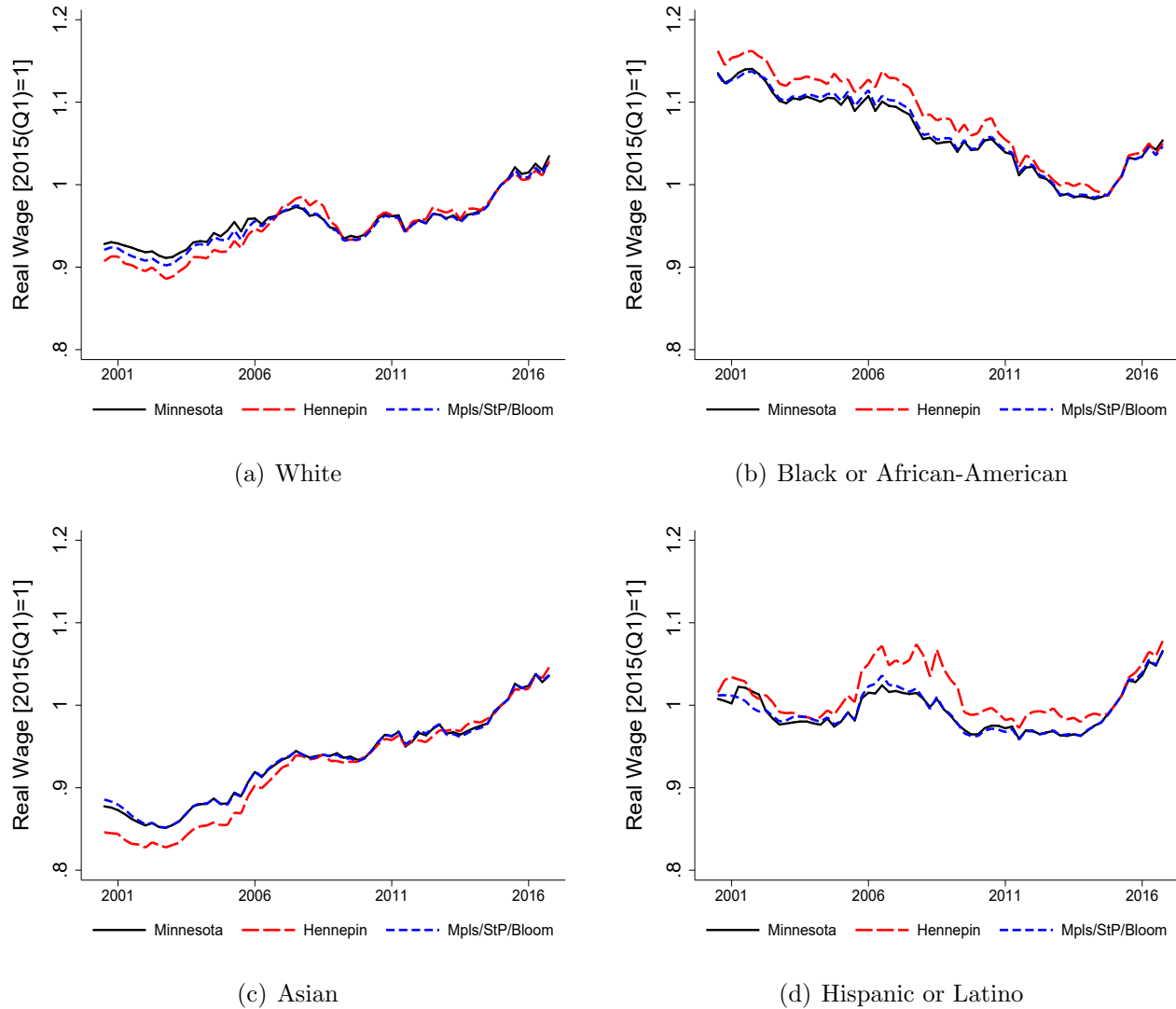


Figure 12: Real Wage Index Across Racial and Ethnic Groups, 2015(1) = 1

the upper panels) experienced significant declines in their wages in the 2000s. At the same time, older workers (in the bottom right panel) have experienced increasing real wages over the entire sample period.

In Figure 12 we present real wage trends for the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington for workers of different race and ethnicity. We find striking differences across groups. Workers who identify as Black or African-American experienced a roughly 15 percent decline in their real wage during the 2000s

and the early 2010s, followed by a modest recovery in the last few years of the sample.<sup>12</sup> The evolution of their wages contrast sharply with the significant employment gains of these workers (previously shown in Figure 6). Workers who identify as Latino or Hispanic experienced relatively stable real wages over time. By contrast, workers who identify as White experienced a roughly 10 percent increase in their real wage and workers who identify as Asian experienced a roughly 15 percent increase in their real wage over our sample period.

We conclude this section by providing further distributional analyses of wages and earnings using data from the American Community Survey (ACS) between 2010 and 2016. The ACS is a large nationally representative survey of households conducted by the U.S. Census Bureau. It contains information on household demographics, employment outcomes, and other socio-economic outcomes. The ACS data after 2012 allows us to identify some of the Minneapolis residents. However, the data do not allow us to identify Minneapolis workers because individuals working in Minneapolis in the 2012-2016 surveys are categorized together with individuals working in other areas of Hennepin county. To handle this issue, we use data from the 2010 and 2011 Census that allow us to identify individuals working in Minneapolis. We associate the incidence of working in Minneapolis as opposed to other areas in Hennepin county with several variables and then use these same variables to predict working in Minneapolis for the 2012 to 2016 period.<sup>13</sup>

In Table 2 we present summary statistics of wages and earnings for workers in Minnesota, the 7 county region, and the city of Minneapolis. To set a benchmark against the 2018 minimum wage increase, we present statistics for wages in 2018 dollars by inflating wages

---

<sup>12</sup>Daly, Hobijn, and Pedtke (2017) document the increase of the wage gap between Black and White workers in the United States between 1979 and 2016. They also document that this gap persists even after conditioning on age, education, industry and occupation, state of residence, and part-time job status. Wilson and Rodgers (2016) reach broadly similar conclusions and discuss the roles of declining unionization, incarceration rates, and anti-discrimination laws.

<sup>13</sup>For our prediction we use place of residence (Hennepin county, Saint Paul, or neighboring areas to Saint Paul), industry and occupation, demographic variables (age, sex, race, marital status, education, and family size), and information on the commuting patterns of the respondents (such as travel time, means of travel, and arriving at work during rush hour). Our process leads us to classify correctly roughly 70 percent of individuals in the 2010-2011 sample.

Table 2: Summary Statistics of Wages (2018 dollars) and Earnings (2018 thousands of dollars)

Region	Measure	Employment	Mean	10 per.	25 per.	50 per.	90 per.
Minnesota	Wages (per hour)	All	26.2	8.1	12.9	20.6	46.5
		Covered by UI	25.7	8.2	13.0	20.6	46.3
		Self-employed	31.7	6.7	11.5	20.3	67.8
	Earnings (per year)	All	51.6	7.2	20.0	39.1	100.0
		Covered by UI	50.5	7.0	20.0	39.4	97.7
		Self-employed	63.0	9.0	19.0	37.8	132.1
7 Counties	Wages (per hour)	All	29.2	9.0	14.6	22.9	52.3
		Covered by UI	28.7	9.2	14.7	22.9	51.5
		Self-employed	35.8	7.8	13.1	22.6	77.8
	Earnings (per year)	All	59.3	9.8	23.8	44.9	111.9
		Covered by UI	58.3	9.7	24.3	45.4	110.8
		Self-employed	70.9	10.4	21.0	42.2	155.6
Minneapolis	Wages (per hour)	All	32.0	9.5	15.5	24.8	57.4
		Covered by UI	31.6	9.6	15.5	24.8	56.5
		Self-employed	33.5	9.4	15.8	24.9	62.1
	Earnings (per year)	All	65.5	11.1	26.7	48.8	121.5
		Covered by UI	64.6	11.0	26.7	48.8	119.4
		Self-employed	68.6	11.5	26.4	48.0	132.4

between 2010 and 2016 with the consumer price index in the Minneapolis, Saint Paul, and Bloomington metro area from the BLS and then assuming a 2 percent increase in each of 2017 and 2018. Our analysis splits all workers between those covered under the unemployment insurance program and those who are not. We define workers covered under the unemployment insurance program as those workers who are classified in the ACS as employees of private companies or individuals and employees of the local, state, and federal government. Our measure of wages for covered workers is wages or salary income in the past 12 months divided by usual hours worked per week in the past 12 months times weeks worked during the past 12 months.<sup>14</sup> For the purposes of these statistics, we define workers uncovered under the unemployment insurance program as those workers who are classified in the ACS as self-employed. To calculate their wage, we use personal earnings instead of wages and salaries.

We summarize important takeaways from the statistics in Table 2. In all regions, mean wages and earnings for covered employees are lower than mean wages and earnings of the self-employed. However, the wages and earnings of the self-employed are more dispersed. For example, while the 10 percentile of the wage distribution in Minneapolis is roughly 9.5 dollars for both types of workers, the 90 percentile is roughly 62 dollars for the self-employed and 57 dollars for covered employees. Comparing across regions, we see that Minneapolis wages for covered employees are on average higher than wages for the 7 counties and the state of Minnesota as a whole. Finally, these statistics show that the minimum wage increase from below 10 dollars in 2017 to roughly 15 dollars by 2024 is expected to affect between 10 and 25 percent of workers in Minneapolis. In Section 4 we provide precise tabulations of the fraction of workers in Minneapolis affected by the minimum wage increase together with their demographic characteristics, their industries, and their occupations.

---

<sup>14</sup>The weeks worked variable in the ACS comes only at bins (e.g. 50 to 52 weeks). We use the (rounded) midpoint of each bin to construct wages. While measurement error from assigning the midpoint could be concerning, we note the similarity of our conclusions using either the distribution of wages or the distribution of earnings.

## 2.4 Turnover Rates

In this section we analyze turnover rates at the industry and worker level using data from the QWI. Turnover is the rate at which stable jobs begin and end. It is calculated by summing the number of stable hires in the reference quarter and stable separations in the next quarter and then dividing this sum by the average full-quarter employment. The QWI defines stable hires as the workers that started a job that lasted at least one full quarter with a given employer. It defines stable separations as the workers who had a job for at least a full quarter and then were separated from the job.

In Figure 13 we plot the (seasonally-adjusted) turnover rate for the state of Minnesota, Hennepin county, and the combined metro areas of Minneapolis, Saint Paul, and Bloomington. The upper left panel presents the turnover rate for all private sector industries. The upper right panel shows the turnover rate for health, which is the largest industry in the state and the various areas. The lower panels display the turnover rates for accommodation and food and retail, industries which according to our analysis in Section 4.2 have a significantly higher fraction of workers earning wages below the minimum wage. Two important findings arise. First, all turnover rates have declined significantly during the 2000s and only slightly recovered since then. These trends in Minnesota parallel the decline in turnover at the national level.<sup>15</sup> Second, industries affected significantly by the minimum wage, such as accommodation and food and retail, have significantly higher turnover rates than the rest of the economy.

Figure 14 shows trends in turnover rates across workers with different educational attainment. We note that all groups have experienced declines in their turnover rate during the

---

<sup>15</sup>See, for example, Davis and Haltiwanger (2014) who document the decline in worker reallocation (hires and separations) and job reallocation (job creation and destruction) in the United States since 2000. The authors highlight that this decline is generally observed within different industries, employer size and age, and worker age, gender, and education groups. Reduced labor market fluidity may result from technological progress that benefits workers by increasing job stability and reducing displacement. According to Davis and Haltiwanger (2014), however, slower turnover may be concerning if it reflects forces such as government regulation and licensing restrictions that result in lower arrival of job opportunities, increased risk for the unemployed of jobless spells, and reduced ability of the employed to move up the job ladder. The authors also associate the secular decline in labor market fluidity with lower employment rates in the cross-section of U.S. states.



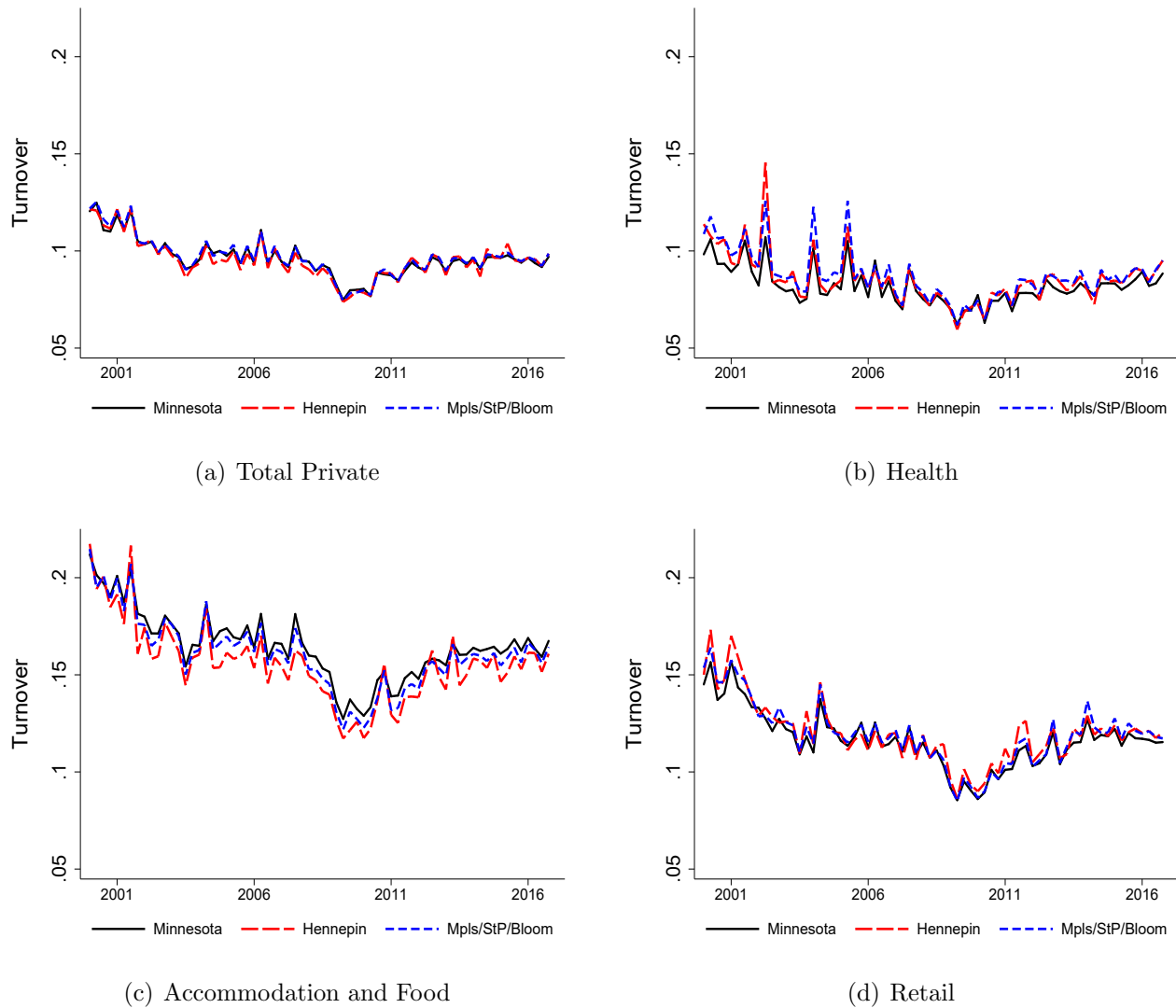


Figure 13: Turnover Rate

2000s that mirror the decline found for the aggregate economy. In terms of differences across groups, Figure 14 shows that workers with less than high school have higher turnover rate levels than all other groups. Our analysis in Section 4.1 shows that this group has the highest fraction of workers earning wages below the increased minimum wage.

Figure 15 shows trends in turnover rates across workers of different age. We again note that all groups have experienced declines in their turnover rate during the 2000s. However, by 2017 the turnover rate for the younger workers has recover to levels observed early in the 2000s.

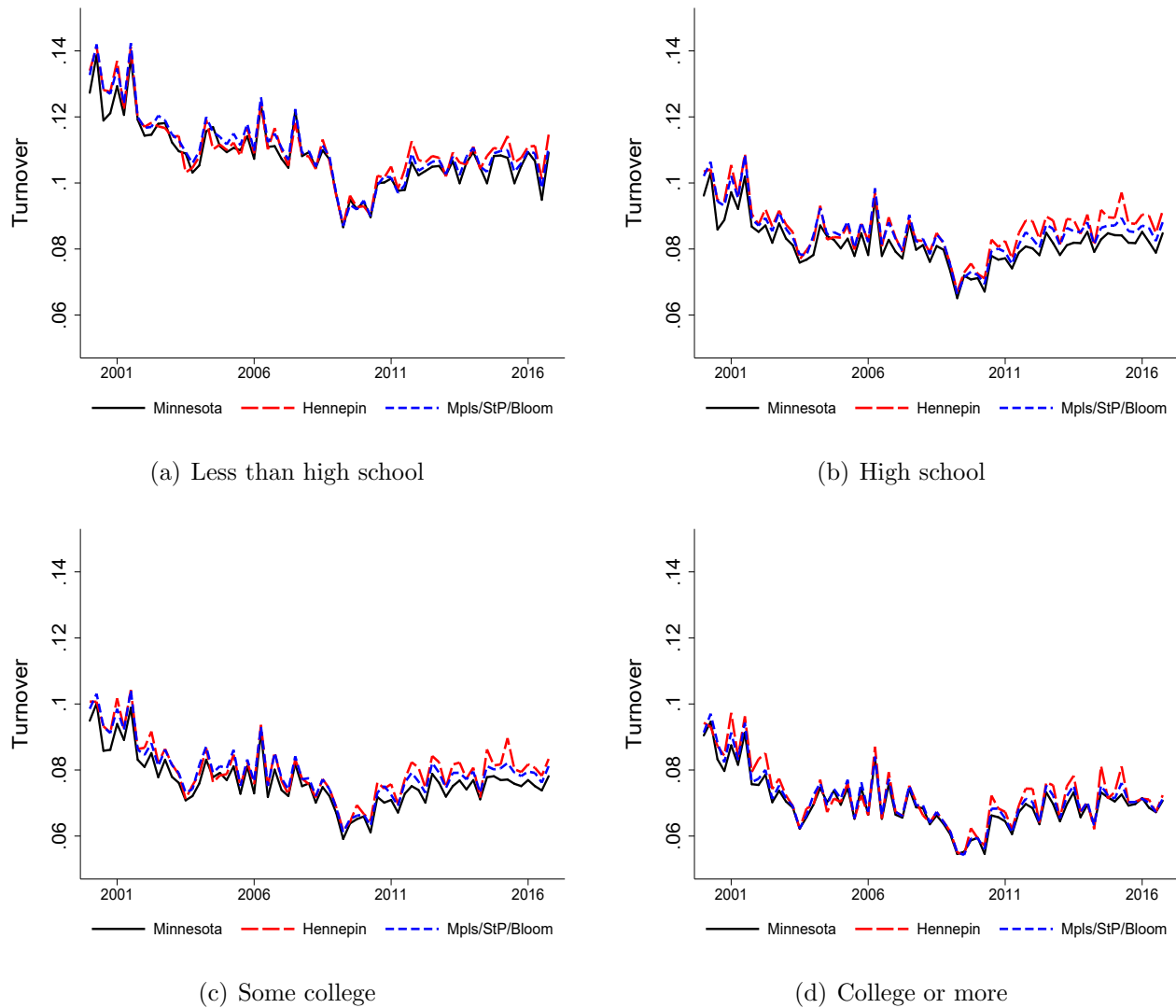
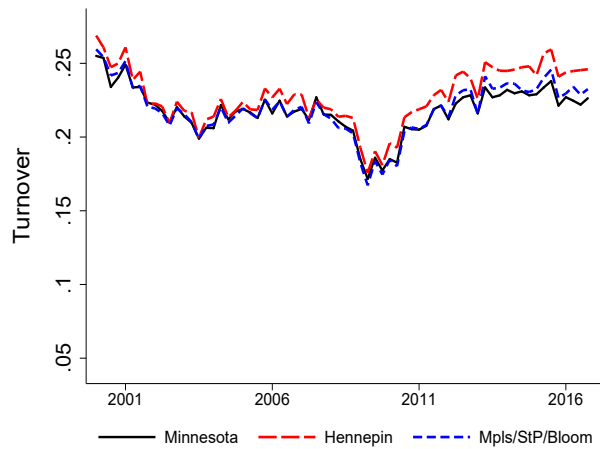


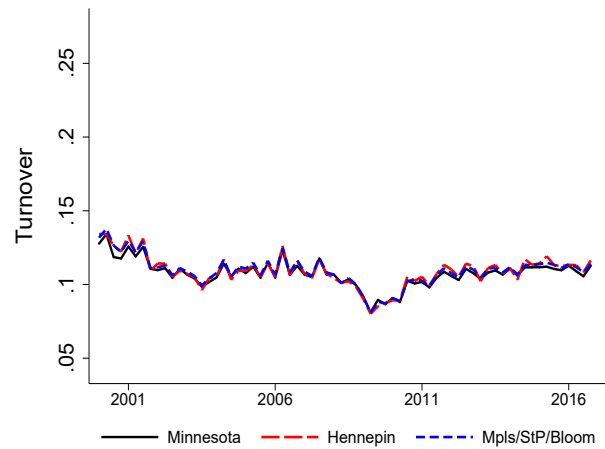
Figure 14: Turnover Rate Across Education Groups

In terms of differences across groups, Figure 15 shows that younger workers have significantly higher turnover rate levels than all other groups. Our analysis in Section 4.1 shows that this group has the highest fraction of workers earning wages below the increased minimum wage.

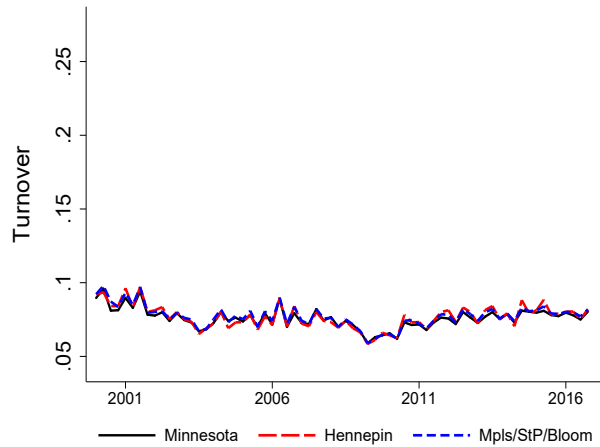
Finally, Figure 16 shows turnover rates for workers of different race and ethnicity. Workers who identify as Black or African-American and Latino or Hispanic have higher turnover rates than workers who identify as White or Asian. Our analysis in Section 4.1 also shows that the former groups have a significantly higher fraction of workers earning wages below the increased



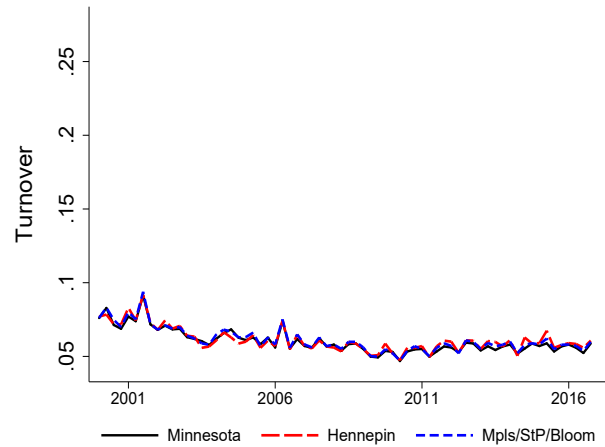
(a) Worker age 19-21



(b) Worker age 25-34



(c) Worker age 35-44



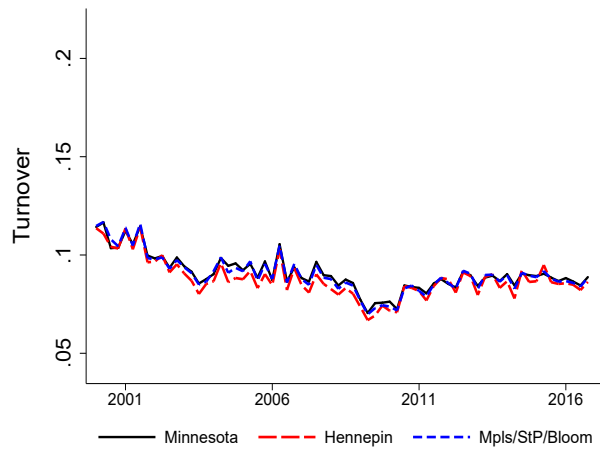
(d) Worker age 55-64

Figure 15: Turnover Rate Across Age Groups

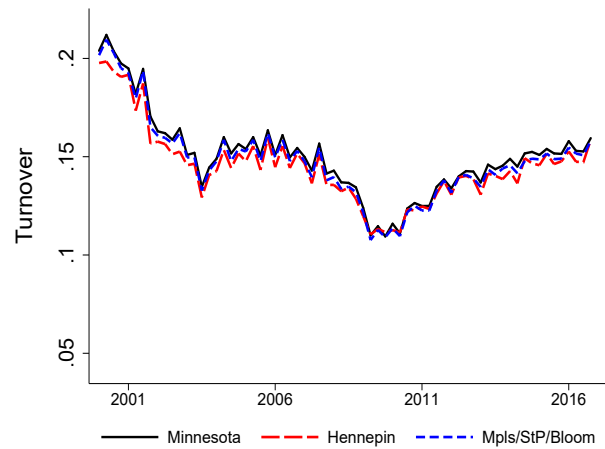
minimum wage relative to other demographic groups.

## 2.5 Establishments and Firms

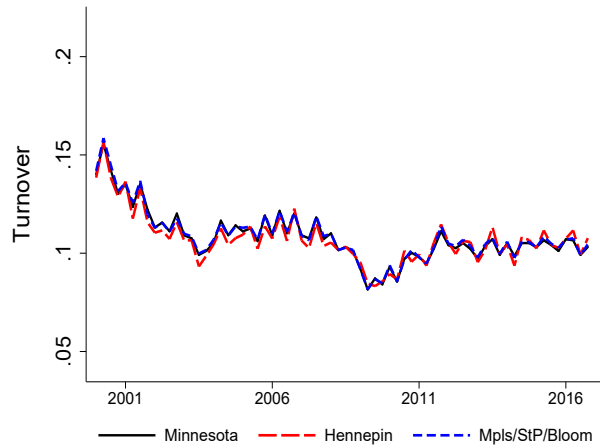
The source data for our analysis of trends in the number of establishments in Minneapolis come from the QCEW and include all establishments covered under the unemployment insurance program. According to the QCEW, an establishment is a single economic unit producing goods or services, located in one physical location, and engaged in one, or predominantly one, type of



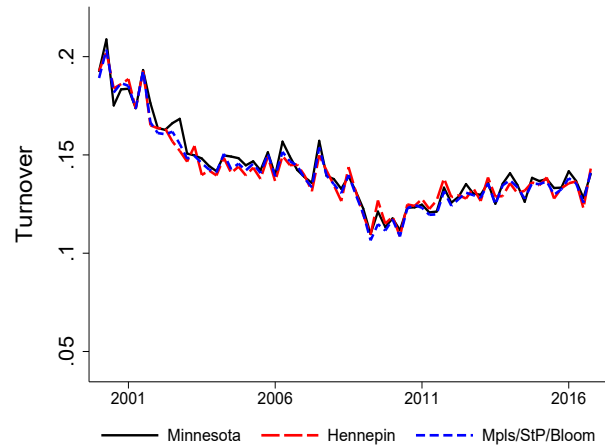
(a) White



(b) Black or African-American



(c) Asian



(d) Hispanic or Latino

Figure 16: Turnover Rate Across Racial and Ethnic Groups

economic activity. This definition contrasts with the definition of a firm or a company which may consist of one or more establishments, with each establishment potentially engaged in different types of economic activity. The QCEW aims to increase the amount of data reported at the establishment level and only reports the predominant economic activity in classifying the industry of an establishment.

Figure 17 presents the (seasonally-adjusted) number of establishments in Minneapolis between 2000 and 2017. It documents a significant decline in the number of establishments



Figure 17: Establishments in Minneapolis

between 2000 and roughly 2015. This decline contrasts with the increase in the number of establishments for both the state of Minnesota and the United States.<sup>16</sup> Mirroring its strong employment growth since 2015, Minneapolis has added roughly 1,000 new establishments since then.

Figure 18 displays trends in the number of establishments for various industries in Minneapolis alongside with total establishments (solid line). To better visualize trends, all number of establishments have been normalized to one in the first quarter of 2015. The figure shows that most industries in Minneapolis have experienced a decline in their number of establishments. Notable exceptions include accommodation and food (in the left panel) and health (in the right panel).<sup>17</sup>

<sup>16</sup>From the QCEW we calculate that the number of U.S. establishments increased from roughly 8 million to roughly 9.5 million over this period. In Minnesota the corresponding numbers are roughly 150 and 160 thousand. The number of establishments is also declining over time in Saint Paul, other neighboring cities to Minneapolis, Hennepin county, and Ramsey county.

<sup>17</sup>The visible decline in the education industry at the end of 2009 reflects almost entirely the decline in the number of establishments in public elementary and secondary schools. This appears to be related to the reorganization and permanent closings of public schools associated with the Changing Schools Options program. Even though schools closed, the decline appears unreasonable both in percent terms and in absolute numbers (decline from roughly 500 to 300 establishments). In private correspondence, the Minnesota Department of Employment and Economic Development (DEED) suggested that school districts are very old and may have changed their

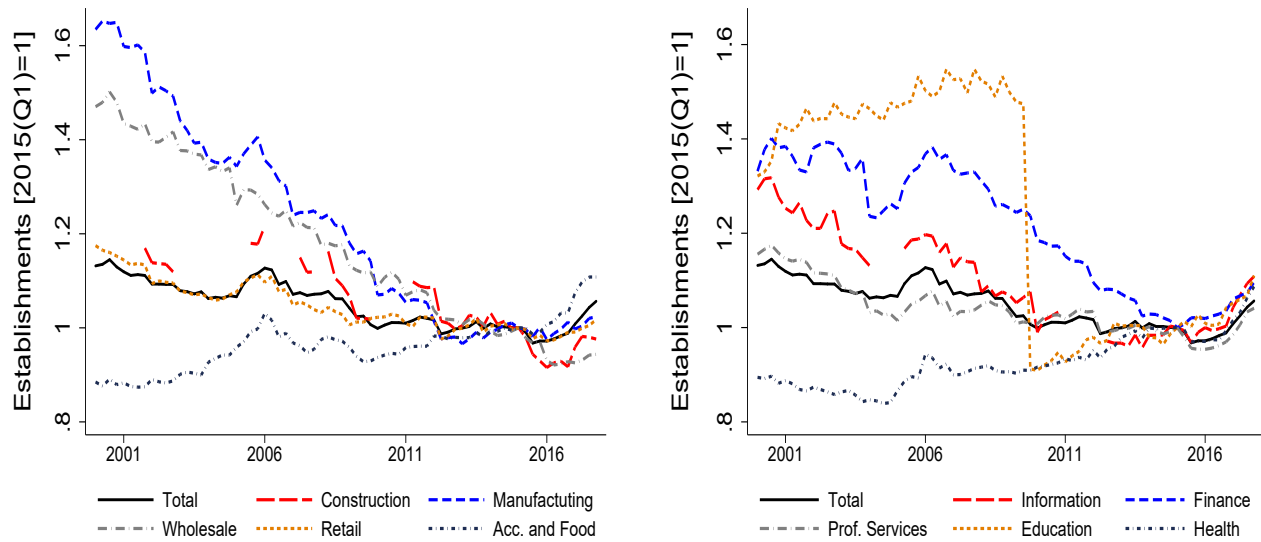
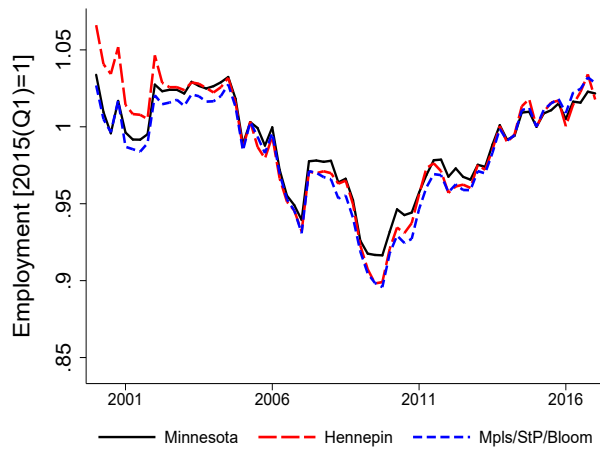
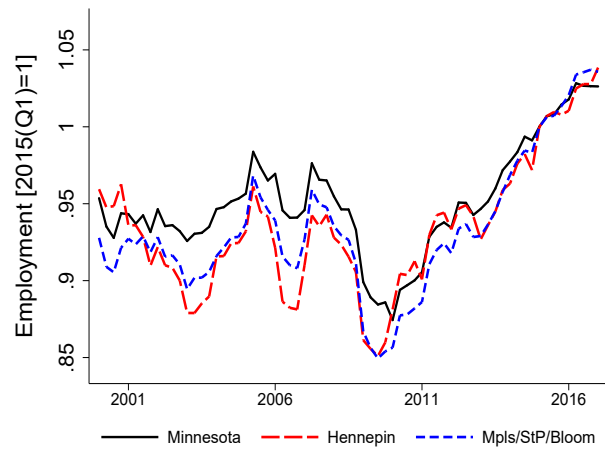


Figure 18: Establishments Index in Minneapolis Across Industries, 2015(1) = 1

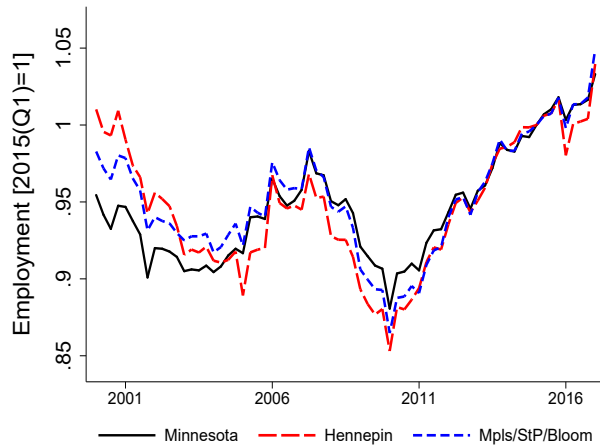
We next turn to QWI data to explore employment and wage trends for firms that belong to different size groups in the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington. For these analyses we focus only on the private sector, since size is reported only for private sector firms. Firm size is defined using employment in March 12 of the previous year at the national level rather than the state level and, therefore, a national firm often is larger than the part of that firm found in the state. We note that the firm size categories defined in QWI's publicly available data do not allow us to examine firm outcomes right around the threshold that determines the timing of the minimum wage increase (100 employees). Rather, the firm size category of 50-249 employees includes both types of affected firms. Nonetheless, the QWI data allow us to compare outcomes for firms that are differentially impacted by the increase in the minimum wage since the data is reported for physical locations without keeping the Unemployment Insurance system updated. Given that employment did not change substantially around that time, it is possible that at that time Minneapolis public schools also reorganized their records and eliminated some dated Unemployment Insurance accounts with zero employees. We note that the elimination of establishments with zero employees by the DEED may also affect the evolution of the recorded number of establishments in other industries.



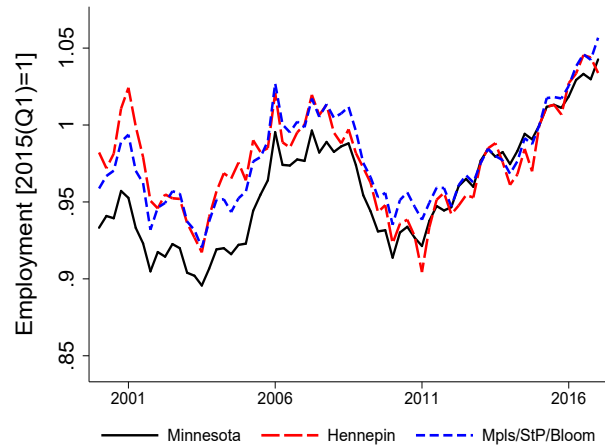
(a) Size 0-19 employees



(b) Size 20-49 employees



(c) Size 50-249 employees



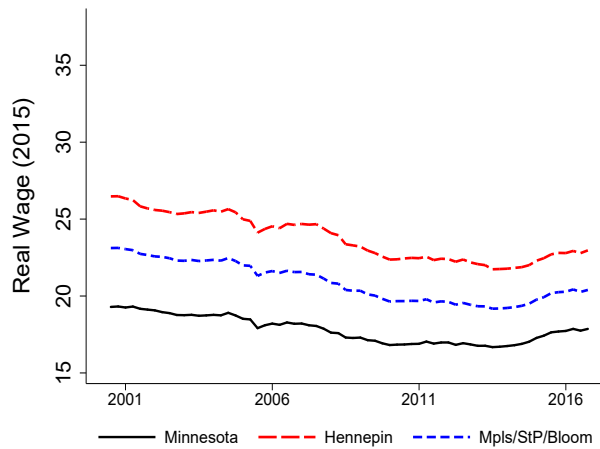
(d) Size 500+ employees

Figure 19: Employment Index Across Firm Size Groups, 2015(1) = 1

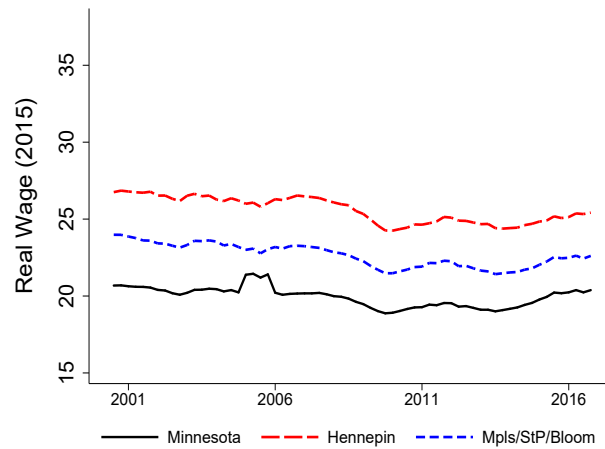
smaller firms (below 20 or 50 employees) and larger firms (above 500 employees).<sup>18</sup>

In Figure 19 we present employment trends for the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington for firms that belong to different size groups. Comparing small firms in the upper left panel to larger firms in the lower panels, we find that small firms' employment declined significantly between 2000 and 2010.

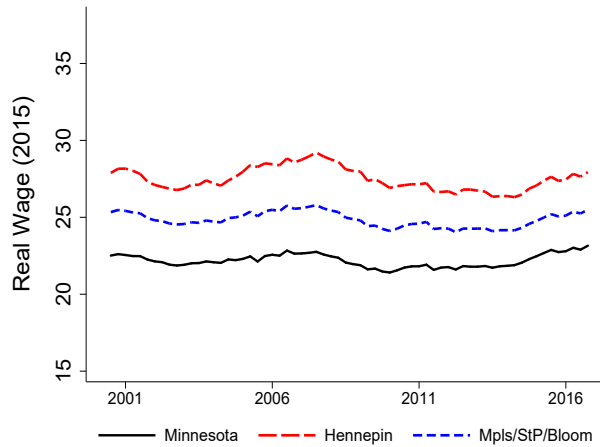
<sup>18</sup>To better visualize differences across firm sizes, we omit from the presentation of our results firms with size between 250 and 499 employees. Employment and real wage growth for these firms is not significantly different from the reported employment and real wage growth for firms with more than 500 employees.



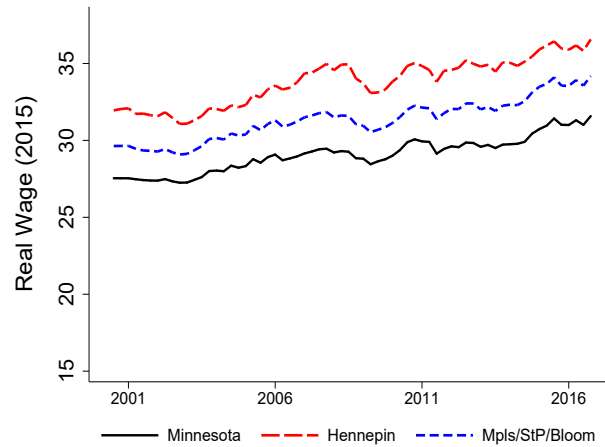
(a) Size 0-19 employees



(b) Size 20-49 employees



(c) Size 50-249 employees



(d) Size 500+ employees

Figure 20: Real Wage (2015 dollars) Across Firm Size Groups

Beginning in 2010, however, all types of firms have experienced roughly similar employment growth rates.

In Figure 20 we present real wage trends for the state of Minnesota, Hennepin county, and the combined metro of Minneapolis, Saint Paul, and Bloomington for firms that belong to different size groups. We first note the significant difference in terms of real wage trends between smaller and larger firms. Smaller firms experienced large declines in their real wages until roughly 2013, with a modest recovery since then. By contrast, larger firms have experienced



relatively stable growth of real wages over time. Second, we find important differences in the levels of wages across firms. We expect a given increase in the minimum wage to affect smaller firms more because they have lower wages on average.

## 2.6 Business Sales

In this section we present the industry composition of sales in Minneapolis and contrast it with Saint Paul. For these analyses, we use sales tax data between 2008 and 2016 collected and digitized by the Minnesota Department of Revenue (DOR). The DOR data includes sales, taxable sales, and sales and use taxes from tax returns and business registration information received from tax filers. Sales tax on motor vehicle sales is not included in the DOR statistics. Businesses not required to file sales or use tax returns or filing zero amounts are not included in the statistics. While most businesses with more than one location file a consolidated return, they list their sales and taxes for each of their locations separately. Therefore, each location counts separately in the statistics and the data are available at the city level.

In Table 3 we present summary statistics of the fraction of gross sales, taxable sales, and employment across industries in Minneapolis and Saint Paul. The gross sales variable is more relevant when thinking about the size of economic activity captured by each sector. However, gross sales is not directly used to calculate any of the sales taxes that businesses pay and, therefore, may be subject to inaccuracies. For this reason we present statistics using both gross sales and taxable sales that businesses report.<sup>19</sup>

We noted previously the similarity of Minneapolis and Saint Paul in terms of employment shares of the industries affected the most by the minimum wage increase. One of the most notable findings of Table 3 is that this similarity extends when we look at measures of sales. In particular, accommodation and food services, administrative services, and, to a smaller extent,

---

<sup>19</sup>As an example where data quality issues arise, the DOR reports that educational services in Minneapolis (NAICS code 611) declared gross sales of 117 million dollars in 2008 which increased to 962 million dollars in 2009. By contrast, taxable sales only increased from 8 to 9 million dollars. In general, the tax data at the region-industry level is subject to large year to year fluctuations which makes an analysis of trends in sales by region and industry less conclusive relative to the other variables we have presented.

Table 3: Industry Composition of Gross Sales, Taxable Sales, and Employment (2008-2016)

(percent of city total)	Gross Sales		Taxable Sales		Employment	
	Minneapolis	St. Paul	Minneapolis	St. Paul	Minneapolis	St. Paul
Utilities	23.1	0.3	35.6	0.4	1.0	0.5
Construction	1.7	4.9	0.3	1.1	2.0	2.9
Manufacturing	9.9	9.0	1.8	4.9	4.8	4.7
Wholesale	11.1	15.5	10.7	7.7	2.9	3.1
Retail	11.8	20.3	14.8	31.2	5.0	5.7
Transportation	0.9	0.7	1.2	0.3	2.4	2.1
Information	2.1	5.6	2.1	11.8	3.7	3.1
Finance and Insurance	1.5	2.2	0.9	0.1	9.4	7.6
Real Estate	0.8	0.7	1.0	1.0	2.4	1.5
Prof., Sc., and Tech.	14.1	5.5	2.0	1.7	11.2	4.2
Management	0.5	0.7	0.1	0.1	6.1	2.7
Administrative Services	2.5	2.8	2.6	4.2	5.1	5.9
Education	3.3	0.7	0.2	0.4	10.3	10.2
Health	6.9	16.8	0.3	0.5	17.5	23.5
Arts and Entertainment	1.1	1.2	2.9	4.2	1.9	2.4
Acc. and Food Services	6.2	4.7	19.8	19.5	8.3	6.6
Other Services	1.9	2.8	3.1	5.8	3.3	4.0
Public Administration	0.3	4.4	0.3	2.0	4.3	13.1

retail are roughly equally important in terms of gross and taxable sales in both cities.<sup>20</sup>

## 2.7 Income and Consumption

In this section we present some baseline measures of income and consumption expenditures. For these analyses we draw on data from the Consumer Expenditure (CE) Survey. CE data are collected by the Census Bureau for BLS and provide information on detailed expenditures, income, and demographic characteristics of households in the United States. The CE provides tabulations of consumption expenditures for metropolitan statistical areas with population above 2.5 million people. The CE sample is relatively small even at the national level and does not include information that would allow us to analyze consumption patterns for households that live or work in Minneapolis. Given these data limitations, our analysis is limited to households that live in the Minneapolis, Saint Paul, and Bloomington metro area.

Figure 21 presents the evolution of income and consumption expenditures over time. All household-level series are deflated with the consumer price index for the Minneapolis, Saint Paul, and Bloomington metro area and transformed into per person levels by adjusting for household size and composition using equivalence scales from the Organisation for Economic Cooperation and Development. The top left panel of the figure shows that pre-tax income per person declined significantly during and after the Great Recession. Since then income has recovered and has reached roughly 50 thousand dollars by 2016. The evolution of consumption expenditures per person parallels that of income, reaching roughly 37 thousand dollars in 2016.

The upper right panel of Figure 21 disaggregates consumption expenditures between spending on non-durables and spending on housing and vehicles. To better visualize their relative growth over time, expenditures are normalized to one in 2015. We note that the evolution of non-durables and durables is similar over time. The bottom left panel separates expenditures in health and education from other non-durable expenditures. We find that health

---

<sup>20</sup>We note the large difference between Minneapolis and Saint Paul in terms of the share of sales accounted for by utilities. That relative employment shares diverge so much from relative sales shares is not surprising given that utilities is an extremely capital intensive industry.

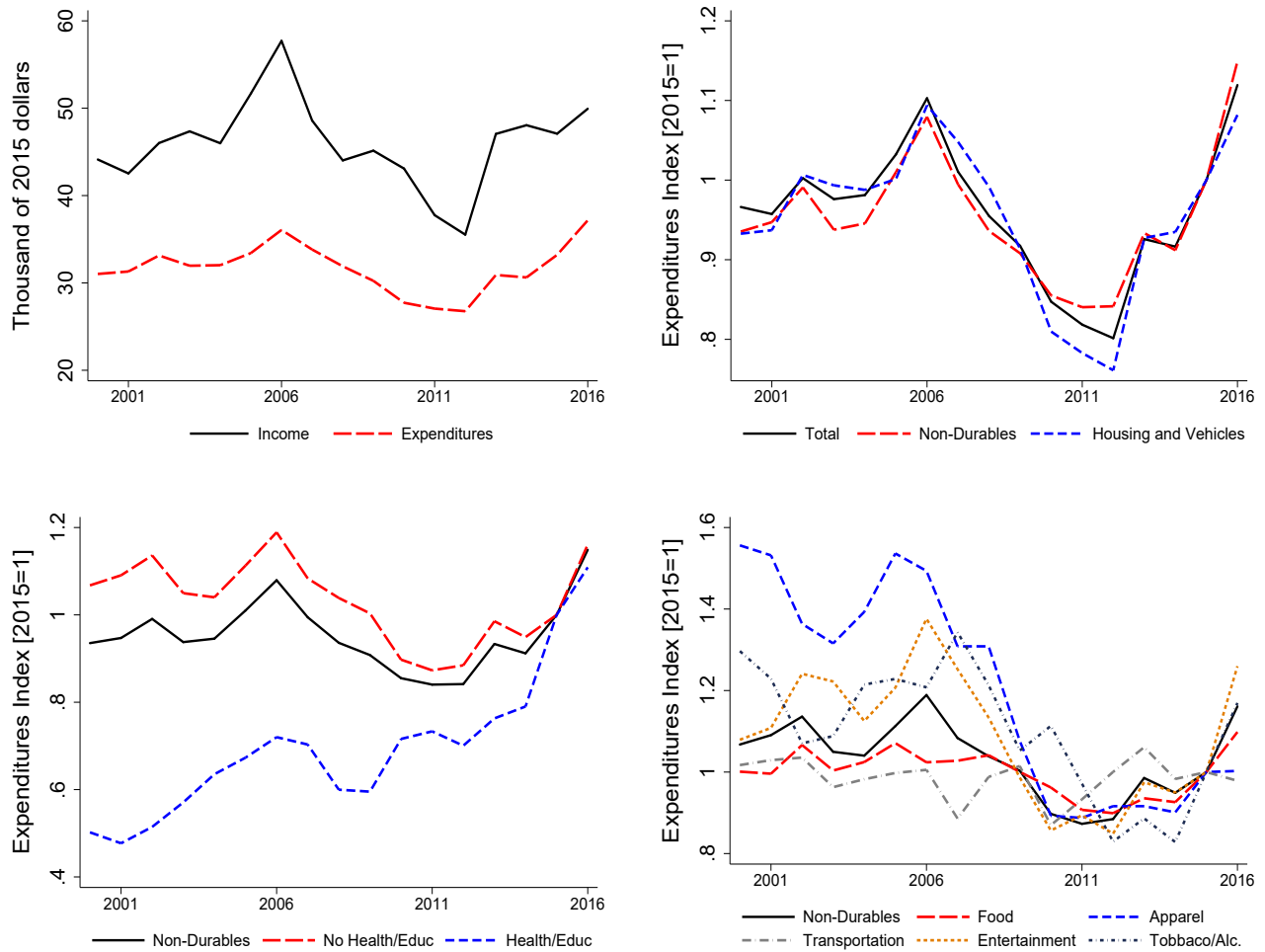


Figure 21: Income and Spending (2015 dollars) in Minneapolis - St. Paul - Bloomington

and educational expenditures have risen significantly over time, mirroring the rising employment importance of these sectors for both the local and the national economy. Finally, the bottom right panel disaggregates the remaining non-durable expenditures into various subcategories. Over time, residents of the metro area have shifted their consumption basket away from apparel, tobacco, and alcohol.

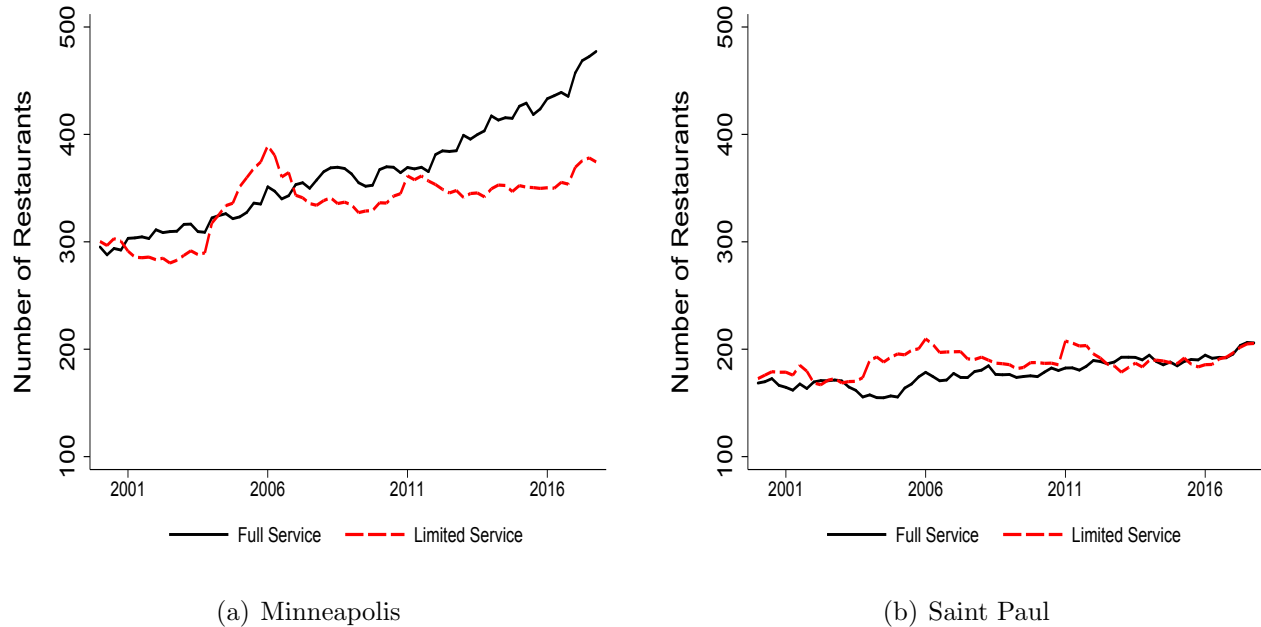


Figure 22: Restaurants in Minneapolis and Saint Paul

### 3 Trends in Restaurant Services

In this section we report trends in selected variables for the restaurant services industry. The data source is the QCEW, which differentiates between full-service restaurants (NAICS code 722511) and limited-service restaurants (NAICS code 722513).<sup>21</sup> We focus on restaurants because, as our analysis in Section 4 demonstrates, the majority of workers in this industry earns wages below the increased level of the minimum wage.

Figure 22 presents the (seasonally-adjusted) number of establishments in the restaurant industry. Beginning in the left panel with Minneapolis, in 2000 there were roughly 300 establishments of full service and a similar number of limited service. By 2017, the number of full-service restaurants has grown to roughly 470, whereas the number of limited service restaurants has grown to roughly 370. Turning to Saint Paul in the right panel, we do not observe this differential growth. Namely, the number of both full-service establishments and

<sup>21</sup>We omit from our analyses cafeterias and snack and nonalcoholic beverage bars as they account for roughly 5 percent of total employment in restaurant services in 2017 in Minneapolis.

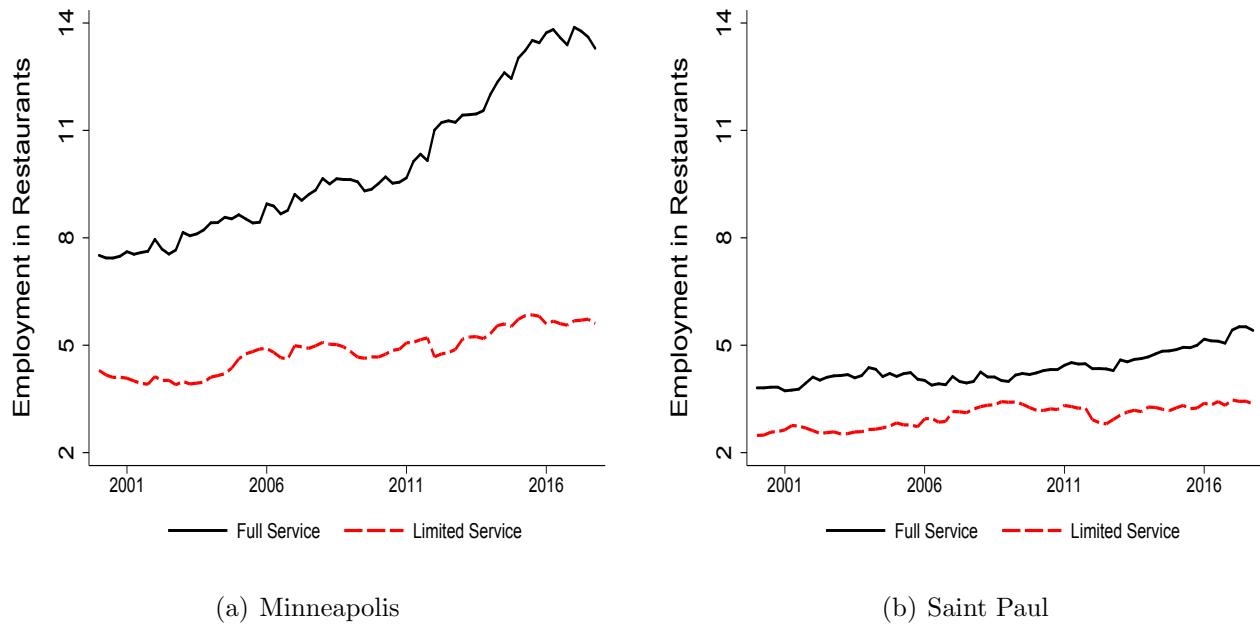


Figure 23: Employment (thousands of jobs) in Minneapolis and Saint Paul Restaurants

the number of limited-service establishments has grown from roughly 170 to roughly 200 over the sample period.

Figure 23 presents the (seasonally-adjusted) number of jobs in the restaurant industry. Mirroring the trends in the number of establishments, employment in full-service restaurants in Minneapolis has grown faster than employment in limited-service restaurants over time. In Saint Paul, employment has grown at a roughly similar rate for the two types of establishments.

In Figure 24 we present the (four-quarter moving-average) of real wages in the restaurant industry. We first note that, assuming a moderate growth of 2 percent per year, average wages will be below the projected level of the minimum wage in both full-service and limited-service establishments (for both cities). This finding is consistent with our results in Section 4.2 that demonstrate that the majority of workers in the restaurant industry will be earning a lower wage than the increased level of the minimum wage in Minneapolis.<sup>22</sup> Wages in full-service

<sup>22</sup>The QCEW aims to include non-wage cash payments such as bonuses and tips in its measure of wages. However, for workers in the restaurant industry these components are likely to be underreported. Federal law allows employers to count tips in applying the full minimum wage. Minnesota, however, prohibits employers from counting tips for purposes of either the state or federal minimum. The minimum wage increase in the city of

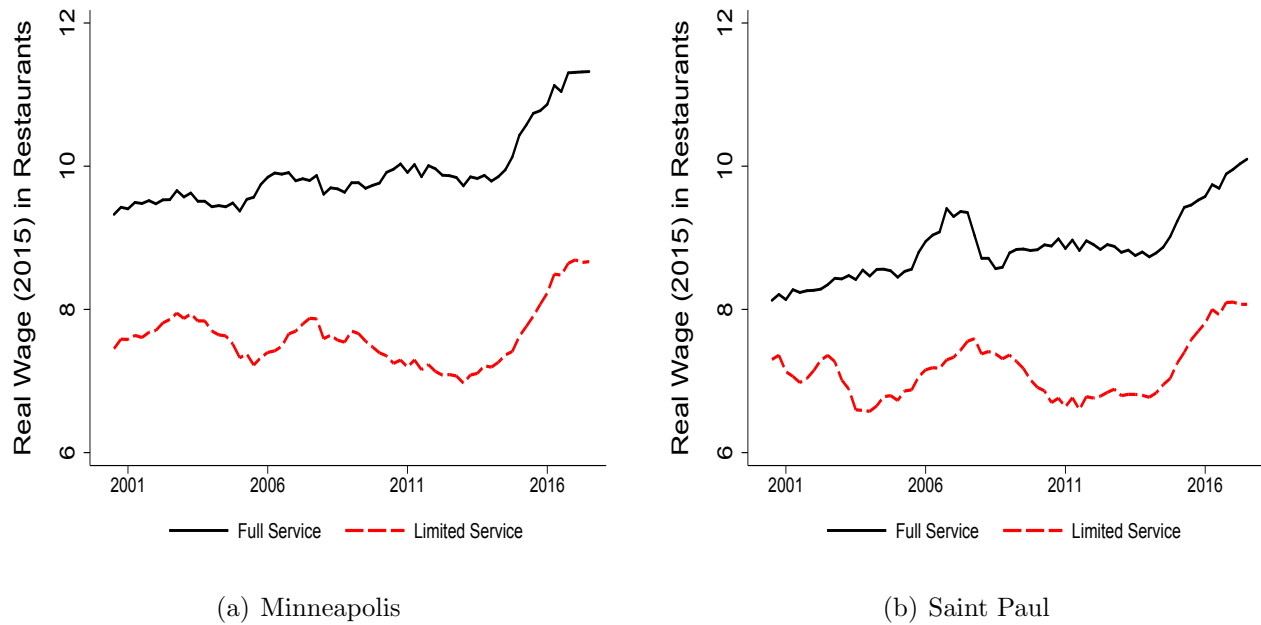


Figure 24: Real Wage (2015 dollars) in Minneapolis and Saint Paul Restaurants

restaurants are roughly 1 to 1.5 dollars higher than wages in limited-service restaurants, so we expect the minimum wage to affect more the latter type of establishments. We also note, wages in Minneapolis exceed wages in Saint Paul, for both types of establishments. Finally, wages in both cities and types of establishments have increased substantially since 2014.<sup>23</sup>

## 4 Workers Affected by the Minimum Wage Increase

In this section we use data from the American Community Survey (ACS) between 2010 and 2016 to document the characteristics of workers affected by the minimum wage increase.<sup>24</sup> We identify as “affected workers” the fraction of workers in Minneapolis who will be earning wages below 115 percent of the increased level of the minimum wage.<sup>25</sup> In these comparisons, we

<sup>23</sup>Minneapolis refers to the wage excluding tips.

<sup>24</sup>The state of Minnesota increased its minimum wage above the federal level in 2014. We also observe an increase in restaurant wages around that period for the state as a whole.

<sup>24</sup>As discussed in Section 2.3, we use information from the ACS surveys in 2010 and 2011 to predict the respondents who are working in Minneapolis in the 2012 to 2016 surveys.

<sup>25</sup>We choose 115 percent following Dube, Giuliano, and Leonard (2015) who document that a large U.S. retailer in the late 1990s implemented raises to workers earning as much as 15 percent above the new minimum wage.

have adjusted workers' wages over time by applying a 2 percent growth rate per year.

Before we present our results, we wish to emphasize that this analysis does not aim to provide an account of the effects of the minimum wage increase on workers' actual wages, earnings, and welfare. Our statistics simply show the fraction of workers that will be earning a wage below the minimum wage in future years, *assuming that nothing else has changed*. Therefore, these calculations do not take into account feedback effects from the minimum wage to economic outcomes potentially arising from a reallocation of economic activity toward other industries or other regions, a substitution across different types of workers, a substitution of labor with other factors or production, changes in relative prices of goods, an increased supply of workers to Minneapolis, or an increase in the income of these workers. Additionally, our analyses do not account for other changes in national or local economic conditions that could affect the structure of wages and employment opportunities in Minneapolis or for particular demographic groups.

## 4.1 Demographics

Table 4 presents the fraction of workers who would earn wages below 115 percent of the minimum wage in 2018, 2020, and 2023.<sup>26</sup> Using data from the 2010 to 2016 ACS, we find that 16 percent of workers earn wages below the 2018 threshold, 20 percent earn wages below the 2020 threshold, and 24 percent earn wages below the 2023 threshold.<sup>27</sup> Multiplying these fractions with the estimate of 326,189 workers in Minneapolis, we estimate that roughly 52,000 workers earn wages below 115 percent of the minimum wage in 2018, roughly 65,000 workers earn wages below 115 percent of the minimum wage in 2020, and roughly 78,000 workers earn

---

Wage spillovers are likely to be different in Minneapolis businesses given differences in the time period, business policies of smaller firms, industrial and occupational composition of affected firms, and the size of the minimum wage increase. We aim to quantify wage spillovers in future reports.

<sup>26</sup>For the minimum wage we use 10.75, 12.50, and 14.75 dollars per hour, which equals the average of the minimum wage applied to businesses that employ above 100 workers and the minimum wage applied to businesses below 100 workers.

<sup>27</sup>Our estimates accord well with independent earlier estimates by the Economic Policy Institute, presented in the Roy Wilkins Center Evaluation (2016), concluding that 23 percent of Minneapolis workers will be affected by an increase of the minimum wage to 15 dollars.



Table 4: Minneapolis Workers Earning Below 115 Percent of Minimum Wage by Demographics

(Employment 2017: 326,189)		2018	2020	2023
Wage Threshold		12.36	14.38	16.96
		Percent Below Threshold		
All		16	20	24
Sex	Men	16	20	24
	Women	16	20	24
Marital Status	Married	8	10	12
	Singles	24	29	34
Education	Less than high school	52	59	67
	High school	33	41	47
	Some college	24	29	33
	College	8	10	14
	More than college	4	5	8
Age	Younger than 20	72	77	81
	20-24	52	60	66
	25-29	19	25	32
	30-34	14	17	22
	35-39	11	12	16
	40-44	10	12	15
	45-49	10	11	14
	50-54	9	11	14
	55-59	9	11	14
	Older than 60	8	11	14
Race	White	13	16	19
	Black or African-American	29	35	42
	All other	25	29	33

wages below 115 percent of the minimum wage in 2023.

Table 4 splits the fractions of affected workers by various demographic characteristics. Given that the bottom of the wage distribution is relatively similar between men and women, we find no differences across sexes in their fractions affected. By 2023, 34 percent of single workers will be affected by the minimum wage increase as opposed to only 12 percent of married workers. The table shows that 52 percent of workers who have not completed high school will be affected by the minimum wage increase in 2018 and that this fraction will increase to 67 percent by 2023. Further, almost half of workers with a high school degree will also be affected by 2023. A smaller, but not negligible, fraction of workers with college degree or more will be affected by the increase in the minimum wage.

Our analysis shows that roughly 80 percent of workers younger than 20 years old will be affected by the minimum wage increase. This fraction remains high for workers below 25 years old. As wages increase with age, a smaller fraction of workers is affected for older groups. For workers older than 40 years old, roughly 10 percent will be affected by the 2018 increase and roughly 14 percent by the 2023 increase.

Finally, the table highlights differences across racial and ethnic groups in their fraction of workers earning below the threshold. Among those who identify as Black or African-American, 29 percent earn a wage below the 2018 threshold and 42 percent earn a wage below the 2023 threshold. These fractions are also high for workers who identify as neither Black or African-American nor as White. Among those who identify as White, 13 percent earn a wage below the 2018 threshold and 19 percent earn a wage below the 2023 threshold.

## 4.2 Industries

Table 5 presents the fraction of workers earning below 115 percent of the minimum wage in 2018, 2020, and 2023 by industry. The first column presents the share of employment in the

Table 5: Minneapolis Workers Earning Below 115 Percent of Minimum Wage by Industry

(Employment 2017: 326,189)		2018	2020	2023
Wage Threshold		12.36	14.38	16.96
Percent of Workers		Percent Below Threshold		
All	100	16	20	24
Utilities	1.4	1	3	3
Construction	2.7	18	22	25
Manufacturing	3.3	17	20	28
Wholesale	1.1	15	17	19
Retail	6.8	31	35	41
Transportation	1.5	21	26	28
Information	1.9	10	13	21
Finance and Insurance	10.4	3	5	6
Real Estate	1.1	22	25	31
Prof., Sc., and Tech.	12.7	6	7	9
Management	0.3	2	2	2
Administrative Services	3.0	37	46	55
Education	15.3	17	20	26
Health	21.1	11	15	18
Arts and Entertainment	2.6	24	30	37
Acc. and Food Services	6.4	52	59	65
Restaurants	5.1	55	62	68
Other Services	3.5	23	28	32
Public Administration	4.8	5	5	8

ACS accounted for by each industry.<sup>28</sup> Accommodation and food is the industry with the largest fraction of workers affected by the minimum wage. Along with accommodation and food, we present estimates for workers in the restaurant industry. We find that 55 percent of workers earn a wage below the 2018 threshold and 68 percent of workers earn a wage below the 2023 threshold.

Other industries with significant fraction of workers affected by the minimum wage increase include administrative services, retail, other services, and arts and entertainment.<sup>29</sup> In education and health, the two largest industries in Minneapolis, roughly 14 percent of workers earn a wage below the 2018 threshold and roughly 22 percent of workers earn a wage below the 2023 threshold. Industries that will not be significantly affected by the minimum wage increase include utilities, management, finance and insurance, professional services, and public administration.

### 4.3 Occupations

Table 5 presents the fraction of workers earning below 115 percent of the minimum wage in 2018, 2020, and 2023 by occupation (defined at the 3 digits). The first column presents the share of employment in the ACS accounted for by each occupation. For the purposes of this analysis, we focus on occupations that account for at least 1.6 percent of total employment in Minneapolis. This leads us to select 22 occupations.

Workers preparing and serving food, bartenders, waiters, laborers, and packers are occupations in which more than 50 percent of workers will be affected by the minimum wage increase in the next couple of years. In some of these occupations, a fraction close to 70 percent will be affected by 2023. Additionally, more than 50 percent of sales workers in retail and cashiers and close to 50 percent of janitors, maids, and ground maintenance workers will be affected

---

<sup>28</sup>These shares differ slightly from the employment shares using the QCEW data in Table 1 mainly because the ACS is a household survey whereas the QCEW is an establishment survey.

<sup>29</sup>Other services (NAICS code 81) includes repair and maintenance, personal and laundry services, various religious and civic organizations, and services employed directly by households such as cooking, gardening, and caretaking.

Table 6: Minneapolis Workers Earning Below 115 Percent of Minimum Wage by Occupation

(Employment 2017: 326,189)		2018	2020	2023
	Wage Threshold	12.36	14.38	16.96
	Percent of Workers	Percent Below Threshold		
All	100	16	20	24
Nurses, Therapists, Veterinarians	6.3	2	3	4
Social Workers, Health Educ., Community Serv.	4.5	11	15	19
Computer, Information, Developers, Analysts	4.5	3	4	5
Animal Care, Supervisors Service	4.0	2	3	6
Food Preparation, Serving, Bartenders	3.7	55	61	68
Postsecondary Teachers	3.7	15	18	21
Janitors, Maids, Ground Maintenance	3.6	34	41	46
Secondary and Less Teachers	3.5	12	15	20
Retail Sales, Cashiers	3.5	43	50	55
Lawyers, Judges, Judicial, Paralegal	3.4	3	4	8
Machinists, Operators, Tenders	3.1	2	5	6
Secretaries, Administrative Assistants	2.8	13	18	22
Sales Advertising, Insurance, Finance, Travel	2.5	5	8	10
Clerks, Customer Srv., Eligibility Interviewers	2.5	18	23	30
Drivers, Bus, Taxi, Other	2.1	18	23	27
Industrial Operators, Laborers, Packers	1.9	45	50	57
Waiters, Dishwashers, Hosts	1.7	50	58	65
Artists and Related Workers, Designers	1.7	12	14	19
Supervisors Office, Telephone Operators	1.6	7	7	9
Computer Architects, Administrators	1.6	3	3	6
Dentists, Nutritionists, Pharm., Physicians	1.6	5	5	7
Architects, Engineers	1.6	2	4	13

by the minimum wage increase by 2023. Other occupations affected by the minimum wage increase include social workers, health educators, and community service workers, teachers, secretaries and administrative assistants, drivers of buses and taxis, artists, and designers.

## 5 Data Requirements for Future Reports

In this section we describe data requirements for assessing the effects of the increase in the minimum wage on a broad set of economic outcomes in future reports submitted to the City of Minneapolis. The key issue we wish to highlight is that a comprehensive analysis of these effects requires knowledge of who is affected and by how much from the increase in the minimum wage. This information can be accessed with confidence using more detailed data sources available at the firm, establishment, worker, and household level.

1. **Labor Markets.** We are grateful to the Department of Employment and Economic Development (DEED) for agreeing to share with us data at the establishment level.
2. **Firm Production.** We are unable at this time to provide an analysis of gross sales at the firm level. Such data are available through the Minnesota Department of Revenue (DOR). We have further requested information available on corporate tax forms M4 and M8 that will allow us to associate sales with compensation and other production variables at the firm level. The DOR has raised confidentiality concerns and has not agreed to provide to us any data at this moment, even in de-identified form.
3. **Consumer Behavior.** The measures of consumption described in Section 2.7 are at a more aggregated level than necessary for an analysis of the consumer effects of the minimum wage. We are not currently optimistic about high quality data sources that will allow us to examine such effects at the consumer-city level.
4. **Goods Prices.** We do not currently have access to sufficiently rich data on prices of goods. For future analyses, we are exploring three options:

- (a) If granted access to DOR data, the labor share at the firm level can be used to indirectly infer the pricing decisions of firms.
  - (b) Nielsen data that mostly covers grocery stores.
  - (c) Online scrapping of restaurant prices.
5. **Worker Benefits.** For future reports, we will be working with the Department of Human Services to analyze data on individuals receiving economic assistance through programs such as Minnesota Family Investment Program, Diversionary Work Program, and Supplemental Nutrition Assistance Program.

## References

- ACEMOGLU, D., AND P. RESTREPO (2017): “Robots and Jobs: Evidence from U.S. Labor Markets,” National Bureau of Economic Research Working Paper.
- AGUIAR, M., M. BILS, K. CHARLES, AND E. HURST (2017): “Leisure Luxuries and the Labor Supply of Young Men,” National Bureau of Economic Research Working Paper.
- AUTOR, D., D. DORN, AND G. HANSON (2013): “The China Syndrome: Local Labor Market Effects of Import Competition in the United States,” *American Economic Review*, 103(6), 2121–2168.
- CHODOROW-REICH, G., AND L. KARABARBOUNIS (2016): “The Limited Macroeconomic Effects of Unemployment Benefit Extensions,” National Bureau of Economic Research Working Paper.
- DALY, M., B. HOBIJN, AND J. PEDTKE (2017): “Disappointing Facts about the Black-White Wage Gap,” Federal Reserve Bank of San Francisco Economic Letter.
- DAVIS, S., AND J. HALTIWANGER (2014): “Labor Market Fluidity and Economic Performance,” National Bureau of Economic Research Working Paper.
- DUBE, A., L. GIULIANO, AND J. LEONARD (2015): “Fairness and Frictions: The Impact of Unequal Raises on Quit Behavior,” Institute for the Study of Labor Working Paper.
- ROY WILKINS CENTER EVALUATION (2016): “Evaluation of a Minimum Wage Increase in Minneapolis and Hennepin/Ramsey County,” The Roy Wilkins Center for Human Relations and Social Justice Humphrey School of Public Affairs Technical Report.
- WILSON, V., AND W. RODGERS (2016): “Black-White Wage Gaps Expand With Rising Wage Inequality,” Economic Policy Institute Report.