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Raising the Minimum Wage in Mississippi: An Econometric Analysis

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Executive Summary

Recently, President Obama called for an increase in the Federal minimum wage. Congress had also responded by introducing the Fair Minimum Wage Act of 2013 (S. 460). That legislation if enacted will increase the minimum wage in three steps, from $7.25 to $10.10 per hour. The rate will then be indexed to inflation each year thereafter. In addition, the legislation will increase the required cash wage for tipped workers in annual 85 cent increases, from today's $2.13 per hour until the tip credit reaches 70 percent of the regular minimum wage. Several other US Senate and House bills including S. 1737, H.R. 1010 and 3746, have also been introduced to increase the minimum wage. None have been enacted to date. The President also issued an Executive Order raising the minimum wage for Federal Contractors to $10.10.

Using the Regional Economic Models, Inc. Mississippi model PI+ V1.5.3, it is estimated that initially 1,766 jobs will be lost in the first year, rising to 9,139 by 2028 then beginning a slow increase in jobs over the next 30 years, absent any other economic change in the economy.

Background

A minimum wage is generally considered the lowest hourly wage that employers are legally required to pay to workers. Equivalently, it is the lowest wage at which workers may sell their labor. In the United States, the U.S. Department of Labor is responsible for issues related to Federal minimum wage rules and regulations.

The first effort to legislate wages did not set minimum wages, rather the laws created arbitration boards and councils to resolve labor conflicts before the recourse to strikes. For Example,

- In 1896, the colony of Victoria, Australia established similar boards
- In 1907, the Harvester decision was handed down in Australia. It established a 'living wage' for a man, his wife and two children to "live in frugal comfort"
- In 1909, the Trade Boards Act was enacted in the United Kingdom, establishing four such boards
- In 1912, the state of Massachusetts, United States, set minimum wages for women and children
- In the United States, statutory minimum wages were first introduced nationally in 1938
- In the 1960s, minimum wage laws were introduced into Latin America as part of the Alliance for Progress; however these minimum wages were, and are, low.

The government action from the Victoria Australia miner's revolt of 1856 is generally considered the first minimum wage implemented.

The Fair Labor Standards Act (FLSA) of 1938 established the minimum wage rate at 25 cents per hour for covered workers. It set the maximum hours at 44 and required "time and a half" pay for standard overtime hours of work. It also reformed child labor practices. Since then, minimum wage has been raised 22 separate times, most recently, in July 2009 when it was increased to $7.25 an hour.

Table 1 presents nominal and real values for statutory minimum wage over time. The inflation adjustments to the minimum wage are made using the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). Real values of the minimum wage are expressed in terms of July 2013 dollars. Data on average hourly earnings in nominal and constant (July 2013) dollars are displayed for comparison purposes.

Table 1. The Statutory Minimum Wage, Hourly Earnings, and Inflation
(real values expressed in July 2013 dollars)

Effective Date	Statutory Minimum Wage (Nominal $)	Staturory Minimum Wage (Real $)	Average Hourly Earnings in the Private Sector (a) (Nominal $)	Average Hourly Earnings in the Private Sector (a) (Real $	Minimum Wage as a Percentage of Average Hourly Earnings	CPI-W (1982-1984=100)
Oct. 1938	$0.25	$4.06	n.a.	n.a.	-	14.10
Oct. 1939	$0.30	$4.88	n.a.	n.a.	-	14.10
Oct. 1945	$0.40	$5.04	n.a.	n.a.	-	18.20
Jan. 1950	$0.75	$7.25	n.a.	n.a.	-	23.70
Mar. 1956	$1.00	$8.49	n.a.	n.a.	-	27.00
Sept. 1961	$1.15	$8.73	n.a.	n.a.	-	30.20
Sept. 1963	$1.25	$9.27	n.a.	n.a.	-	30.90
Feb. 1967	$1.40	$9.69	$2.81	$19.53	50	33.10
Feb. 1968	$1.60	$10.69	$2.95	$19.85	54	34.30
May 1974	$2.00	$9.39	$4.39	$20.68	46	48.80
Jan. 1975	$2.10	$9.18	$4.61	$20.23	46	52.40
Jan. 1976	$2.30	$9.41	$4.91	$20.18	47	56.00
Jan. 1978	$2.65	$9.67	$5.68	$20.78	47	62.80
Jan. 1979	$2.90	$9.67	$6.16	$20.64	47	68.70
Jan. 1980	$3.10	$9.07	$6.61	$19.43	47	78.30
Jan. 1981	$3.35	$8.77	$7.22	$18.99	46	87.50
Apr. 1990	$3.80	$6.84	$10.15	$18.37	37	127.30
Apr. 1991	$4.25	$7.31	$10.47	$18.11	41	133.30
Oct. 1996	$4.75	$7.00	$12.18	$18.00	39	155.50
Sept. 1997	$5.15	$7.45	$12.64	$18.32	41	158.30
July 2007	$5.85	$6.58	$17.45	$19.71	34	203.70
July 2008	$6.55	$6.94	$18.02	$19.10	36	216.30
July 2009	$7.25	$7.89	$18.52	$20.19	39	210.53
Nov. 2013 (b)	$7.25	$7.25	$20.31	$20.31	36	229.13

Source: Minimum wage levels in nominal dollars from the U.S. Department of Labor. Nominal earnings and the CPI from the U.S. Bureau of Labor Statistics. Real minimum wage and earnings levels calculated by CRS.

Notes: n.a. = not available.

a. The not seasonally adjusted earnings data cover production and nonsupervisory employees in the private sector of the nonfarm economy who in recent years have made up about 82% of all private nonfarm employees. Earnings data for all private sector employees in the nonfarm economy were not calculated until 2006.

b. Latest earnings and price data available at the time of the fact sheet's preparation.

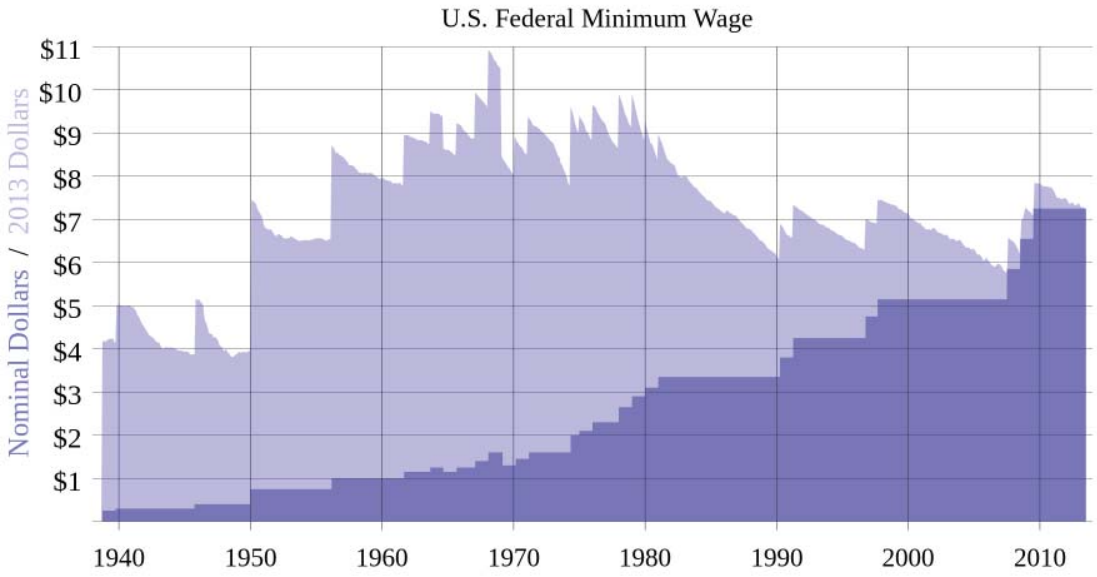
Congressional Research Office, Inflation and the Real Minimum Wage: A Fact Sheet, January 8, 2014

Note that the peak value of the real minimum wage was reached in 1968. To equal the purchasing power of the minimum wage in February 1968 ($10.69), the current minimum wage's real value would have to increase by 47% ($3.44). Although the nominal value of the minimum wage was increased from $1.60 to $7.25 ($5.65 increase) between 1968 and 2009, these legislated adjustments did not enable the minimum wage to keep pace with the increase in consumer prices, thus real minimum wages fell.

In addition the level of the minimum wage also has been compared with the average hourly earnings of most workers in the private nonfarm economy. That ratio also peaked in 1968 at 54%. In no other year did the minimum wage exceed half of average hourly earnings.

The Department of Labor has specified dozens of exemptions to minimum wage law including certain jobs, including farm workers, seasonal workers, newspaper deliverers, "informal" workers (babysitters, etc.). Any worker who earns regular tips (specified as earning at least $30 in tips a month by the FLSA) is eligible for a special minimum wage rate. "Youth Minimum Wage Program" allow young workers under the age of 20 to be paid a special minimum wage of $4.25 per hour for the first 90 days of employment with any employer. Certain employers, including retail or service stores, agriculture, or colleges and universities, are permitted to pay

full time students as little as 85% of the minimum wage as long as they are registered students. Any employer can pay sub-minimum wage to any worker with a physical or mental disability that affects the amount and/or quality of their work. Also, certain nonprofit and educational organizations can apply for a certificate from the Department of Labor allowing them to hire workers for as little as 85% of the applicable minimum wage.

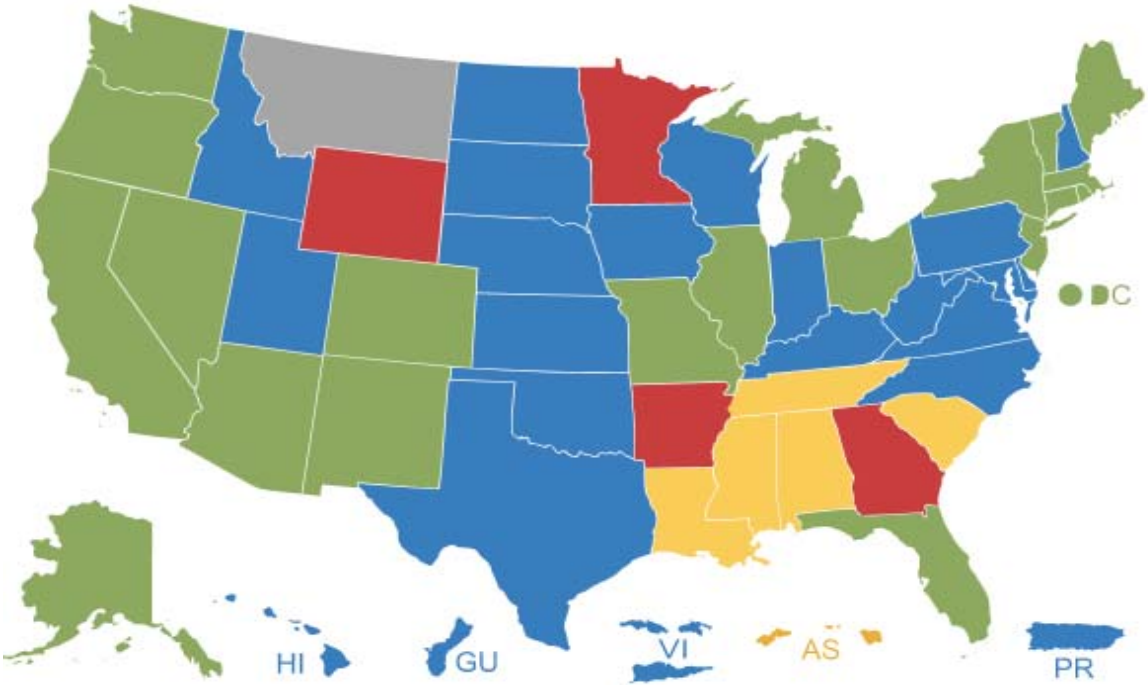


This chart is a history of minimum wage increases under the 1938 FLSA act. The data is current as of July 2013, with the inflation adjustment based on July 2013 CPI.

Minimum wage rates vary by state. According to the U.S. Department of Labor,

- As of Jan. 1, 2014, 21 states and the District of Columbia have minimum wages above the federal minimum wage.
- 19 states have minimum wages the same as the federal minimum wage of $7.25.
- 4 states have minimum wages below the federal minimum wage (the federal minimum thus applies).
- 1 state, New Hampshire, repealed their state minimum wage in 2011, but left the reference to the federal minimum wage.
- 5 states including Mississippi have not established a state minimum wage.

Minimum Wage Laws in the States - January 1, 2014



	States with minimum wage rates higher than the Federal		States with no minimum wage law
	States with minimum wage rates the same as the Federal		States with minimum wage rates lower than the Federal
	American Samoa has special minimum wage rates		

Minimum Wage and Overtime Premium Pay Standards Applicable to Nonsupervisory NONFARM *Private Sector* Employment Under State and Federal Laws January 1, 2014

(source: US Department of Labor Wage and Hour Division)

Research Review of Minimum Wage

The employment effect of the minimum wage is one of the most studied topics in all of economics.

In 1977, the Minimum Wage Study Commission (MWSC) undertook a review of the existing research on the minimum wage in the United States (and Canada).

The three economist involved in the MWSC study, Brown, Gilroy, and Kohen, distinguished between employment effects on: teenagers (ages 16-19), where they concluded that a 10 percent increase in the minimum wage reduced teen employment, most plausibly, from between zero and 1.5 percent; young adults (ages 20-24), where they believed the employment impact is "negative and smaller than that for teenagers"; and adults, where the "direction of the effect...is uncertain in the empirical work as it is in the theory." Their summary of the theoretical and empirical research through the late 1970s suggested that any "dis-employment" effects of the minimum wage were small and almost exclusively limited to teenagers and possibly other younger workers.

In the late 1990s a new round of minimum wage effects research began. The most influential of the studies using a natural experiment was David Card and Alan Krueger's (1994) paper on the impact on fast-food employ-

ment of the 1992 increase in the New Jersey state minimum wage. In advance of the 1992 increase in the New Jersey state minimum wage, Card and Krueger conducted their own telephone survey of fast-food restaurants in New Jersey and neighboring Pennsylvania. They repeated the survey after the increase had gone into effect and then compared the change in employment in New Jersey's restaurants (the minimum wage treatment group) with what happened in Pennsylvania (the control group). They found "no evidence that the rise in New Jersey's minimum wage reduced employment at fast-food restaurants in the state."

The new minimum wage research methods were based on important differences in the "bite" of the federal minimum across the states. Any given increase in the federal minimum, the thinking went, should have more impact in low-wage states, where many workers would be eligible for an increase, than it would in high-wage states, where a smaller share of the workforce would be affected. Card, for example, divided the U.S. states into three groups – low-impact, medium-impact, and high-impact – according to the share of their teenage workforce that would be affected by the 1990 and 1991 increases in the federal minimum wage. His analysis concluded: "Comparisons of grouped and individual state data confirm that the rise in the minimum wage raised average teenage wages... On the other hand, there is no evidence that the rise in the minimum wage significantly lowered teenage employment rates..."

In 1996 and 1997, the federal minimum wage was increased from $4.25 to $5.15, thereby increasing the minimum wage by $0.90 in Pennsylvania but by just $0.10 in New Jersey. Saul D Hoffman and Diane M Trace in their 2009 study *NJ and PA Once Again: What Happened to Employment When the PA–NJ Minimum Wage Differential Disappeared?* They concluded that consistent evidence from employment of "at-risk" groups was negatively affected in Pennsylvania relative to other groups in Pennsylvania and to comparable groups in New Jersey.

Arindrajit Dube, T. William Lester, and Michael Reich in their 2010 study *Minimum wage effects across state borders: Estimates using contiguous counties found* "For cross-state contiguous counties, we find strong earnings effects and no employment effects of minimum wage increases."

Other "meta studies" drew similar varied conclusions including little effect on employment, consistent negative employment effects, and strong dis-employment effects on least skilled groups of workers. In summary, the voluminous literature by many respected researchers over several decades on minimum wages offers little consensus on the extent to which a wage floor impacts employment.

Jonathan Meer and Jeremy West in their December 2013 study entitled *Effects of the Minimum Wage on Employment Dynamics* argue that the effect of the minimum wage should be more apparent in new employment growth than in employment levels. They found that the minimum wage reduces net job growth, primarily through its effect on job creation by expanding establishments. These effects are most pronounced for younger workers and in industries with a higher proportion of low-wage workers. In effect they conclude that increasing the minimum wage allows for job growth but at some reduced level of job growth without a minimum wage increase.

Finally, the U.S. Congressional Budget Office (CBO) recently released a report entitled *The Effects of a Minimum-Wage Increase on Employment and Family Income*. The CBO estimated that a fully implemented minimum wage increase to $10.10 would reduce total U.S. employment by about 500,000 workers. The CBO report also concluded that "Increasing the minimum wage would have two principal effects on low-wage workers. Most of them would receive higher pay that would increase their family's income, and some of those families would see their income rise above the federal poverty threshold. But some jobs for low-wage workers would probably be eliminated, the income of most workers who became jobless would fall substantially, and the share of low-wage workers who were employed would probably fall slightly."

Minimum Wage Estimates for Mississippi

The U.S. Bureau of Labor Statistics (BLS) estimated that there were 700,000 employed wage and salary workers paid hourly rates in 2012 or 51.6% of the estimated 1,357,166 full and part-time workers 16 years old and older (not including self-employed workers). In that estimate, 21,000 hourly workers were paid minimum wage of $7.25 and 24,000 were paid less than minimum wage. Mississippi workers being paid at or below the minimum wage comprise about 6.4% of workers being paid hourly rates.

At the national level, BLS estimated that 24.1% of hourly workers paid at or below the minimum wage were 16 to 19 years of age, suggesting that most of these workers are either in school or have dropped out of school. Mississippi has a significant number of high school dropouts implying that perhaps its percentage of workers 16-19 years of age is higher than the national estimate. In addition, 26.5% of hourly workers paid at or below the minimum wage were 20 to 24 years of age. Many 20 to 24 year olds are likely to still be in school and/or working part-time. Thus, more than half of all hourly workers paid at or below the minimum wage level a young and in school or young and have dropped out of the educational process. Generally, age of the worker impacts hourly wage rates and a worker's age correlates with part-time/full- time employment status, educational attainment and skills level, industry or sector of employment, and status in a household.

BLS also estimated the percentage of workers being paid at or below the minimum wage by educational attainment – 27.9% had less than a high school diploma and 29.5% held only a high school diploma. Low educational attainment is strongly associated with lower hourly wage rates.

Methodology for Analysis of Increasing Mississippi's Minimum Wage

The economic impact analysis for changes in Mississippi's minimum wage levels from $7.25 to $10.10 beginning in 2014 utilizes a robust, comprehensive model constructed by Regional Economy Models, Inc. - REMI PI+ V1.5.3. PI+ is a dynamic economic and demographic simulation model of the Mississippi economy consisting of 160 economic sectors (5 digit NAICS codes).

The REMI model builds from historic data for Mississippi that estimate its place in the national and international economies as well as reflect the evolving structure of employment and relative productivity across the state's economic sectors as the minimum wage is increased. Changes to the model in the manner of cost of labor and cost of business production increases create a disequilibrium in the state's existing economic relationships and as the economic model moves to regaining its general equilibrium, computes and measures the resultant changes that have taken place to re-establish its equilibrium (increases or decreases in employment, changes in personal consumption, changes in prices, changes in productivity, etc.). The policy variables to be changed in the model are Production Costs due to higher labor costs and Wage Bill due to higher earnings by employees, each by equal amounts.

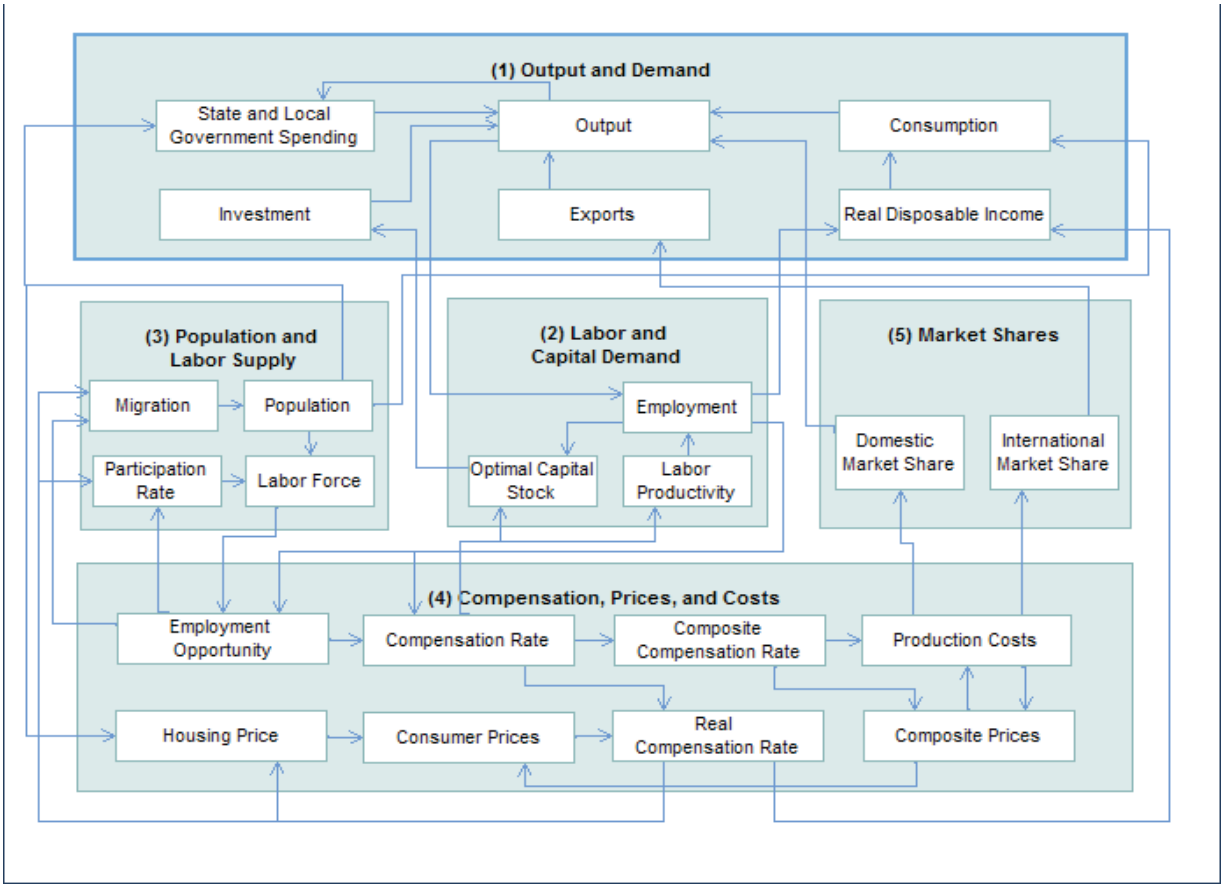
Increases in business production costs will decrease the relative competitiveness of a regional industry through reduced market share, resulting in lower output and less employment demand. Each industry attempts to pass on the higher costs of production. No factor substitution is implied in this analysis, that is, no new products, automation of work, etc. will be estimated or accounted for. The analysis is conducted for the state of Mississippi without consideration that other states might increase minimum wage or that a national minimum wage increase is implemented. Additionally, no estimates for inflation in future years are included in the analysis.

Increases in the wage bill, that is, the total dollar amount paid in wages to employees within the state by industry, by year increases the nominal income in households. Household consumption then increases for example in retail, food, housing, etc. Overall increase in income thus affects in-migration and other economic factors.

Production cost increases are balanced with wage bill increases and the model then computes the various increases/decreases in economic variables. While there is little consensus on the microeconomic (individuals and households) effects of whether there are few jobs, better pay, and less people in poverty, the macroeconomic (state) effects of increase in household spending versus decreased industry competitiveness due to higher production costs are seldom analyzed.

A general view of the REMI PI+ model and its interdependence is illustrated in the diagram below. The lines with arrows on either end represent the interaction of parts of the economy and the director of flow of those interactions.

REMI Model Structure



Methodology to Estimate Hourly Wage Rate Distribution by Industry Sector

The fundamental estimate needed to conduct an analysis of the impact of an increase in minimum wage is number of jobs in each economic sector by wage distribution. For example, the retail sector employed an estimated 165,434 full and part-time, hourly and salaried workers in 2012. Estimating the number of full-time hourly workers by wage range (below minimum wage, at minimum wage, $7.26 to $9.25 per hour, $9.26 to $11.49 per hour, etc.) is the basis for then determining the increase in total wages (and total production cost increase for the retail sector) necessary to conduct the analysis.

The U.S. Bureau of labor Statistics (BLS) estimated Mississippi had 700,000 full-time hourly wage earners in 2012. Full time hourly workers comprise about 46.2% of the state's total employment excluding any self-employed workers. In 2012 the BLS estimated that 45,000 Mississippi workers were paid $7.25 per hour or less, of which 21,000 or 3% were paid minimum wage and 24,000 or 3.4% were paid below minimum wage.

The first step estimating the number of hourly workers by wage rate and industry is estimating the number of workers by wage distribution. Using the U.S. Census American Community Survey 3-year Mississippi estimates (2010-2012) of percent of full-time wage earners by income distribution, the number of hourly wage earners (700,000 by BLS estimates in 2012) in each wage range is estimated as follows:

Below $7.25/hour	At $7.25/hour	From $7.26 to $9.25	From $9.26 to $11.49	From $11.50 to $14.49	From $14.50 to $18.24	From $18.25 to $22.74	From $22.75 to $28.74	From $28.75 to $35.99	Total
25239	21000	61932	69054	103889	143101	108760	145095	21930	700000

While there may be some full-time hourly wage earners in the wage rate ranges above $36.00 per hour, to stay within the bound of 700,000 full-time hourly wage earners, it is assumed those numbers are small relative to the total number of such wage earners.

The second step in estimating the number of full-time hourly workers by wage rate and industry is to develop a relationship between occupations and industry since BLS has estimates by occupations for wage ranges (http://www.bls.gov/oes/2012/may/distribution.htm). Utilizing the REMI model's National Industry Occupational matrix, the percentage of each occupation is estimated for each of the 160 industry sectors. Each of the 22 occupations (Management, Business and Financial operations, Computer and mathematical, Architecture and engineering, Life physical and social science, Community and social service, Legal support workers, Education training and library, Arts, design, entertainment, sports, and media, Healthcare practitioners and technical, Healthcare support, Protective service, Food preparation and serving related, Building and grounds cleaning and maintenance, Personal care and service, Sales and related, Office and administrative support, Farming, fishing, and forestry, Construction and extraction, Installation, maintenance, and repair, Production, and Transportation and material moving)are related to the 160 economic sectors. Using the BLS estimates of the 22 occupation groups by wage range and the REMI National Industry Occupational matrix, the percentage of workers in each industry sector by wage range is computed. For example, about 5.56% of the construction sector workers are in management.

To estimate the number of workers below the wage rate $9.25 per hour (BLS occupation estimates aggregate all workers below $9.25 per hour into one amount), the number of workers at or below minimum wage in the BLS (http://www.bls.gov/cps/minwage2012tbls.htm#1) is used. This table displays an estimate of employed wage and salary workers paid hourly rates with earnings at or below the prevailing federal minimum wage by industry for the U.S. The calculated percentage of workers in each industry sector estimates Mississippi workers at and below the minimum wage by industry sector is then used with the calculated percentage of workers in each industry sector by wage rage.

The percentage estimate of workers in each industry sector by wage rate are then converted to the number of workers in each industry sector by wage range using REMI's estimates of the total number of workers in each industry sector.

The total of additional wage increase (and production cost increase) for each industry sector for all wages in each sector is computed by multiplying the number of workers in each wage range of each industry sector by the expected increase in wages for each wage range. For example, an estimated 251 hourly workers in construction are paid minimum wage. Assuming each worker works an average of 38 hours per week for 50 weeks at the new minimum wage of $10.10, the annual additional wages per worker is $5415. The total additional wages for construction workers for those earning exactly the new minimum wage is $1,359,165.

For each of the other wage ranges (below $7.25, $7.26 to $9.25, etc.) it is necessary to estimate the effect of an increase in minimum wage for each wage range. Only those workers being paid minimum wage will earn the full amount of new minimum wage. Hourly wages below minimum wage will be increased somewhat but

not the full amount of the new minimum wage increase. Likewise, hourly wages above the minimum wage will be increased somewhat but not the full amount of the new minimum wage increase. The higher the hourly wage, the less the new minimum wage increase will affect the higher wage. For example, workers being paid $28.75 to $35.99 per hour will receive very little of the minimum wage increase.

A 2004 study (*Economic Analysis of Arizona Minimum Wage Proposal*) by Robert Pollin and Jeannette Wicks-Lin of the "ripple effect" of raising the minimum wage from $5.15 to $7.75 in Arizona suggests that hourly workers earning between $5.15 to $8.00 will receive raises ranging, on average, between 5 percent to 24 percent.

Using the estimates by Pollin and Wick-Lin, the total additional wages for each industry sector at each wage rate range can be estimated by summing the product of the number of jobs in each wage range by the estimated increase in annual wages for each wage range.

As expected the industry sector making the largest contribution to Mississippi total annual wages when the minimum wage is increased is the retail trade sector. The others economic sectors in the top ten contributors to total annual wage increase are as follows:

Rank of Increase in Total Annual Wages by Economic Sector

Total Increase in Annual Wages	Rank	Industrial Sector
$72,374,399	1	Retail trade
$68,059,240	2	Food services and drinking places
$53,107,450	3	State and Local Government
$22,932,363	4	Accommodation
$18,740,990	5	Construction
$17,040,355	6	Farm
$10,247,725	7	Wholesale trade
$10,081,322	8	Real estate
$9,852,376	9	Services to buildings and dwellings
$9,537,602	10	Offices of health practitioners

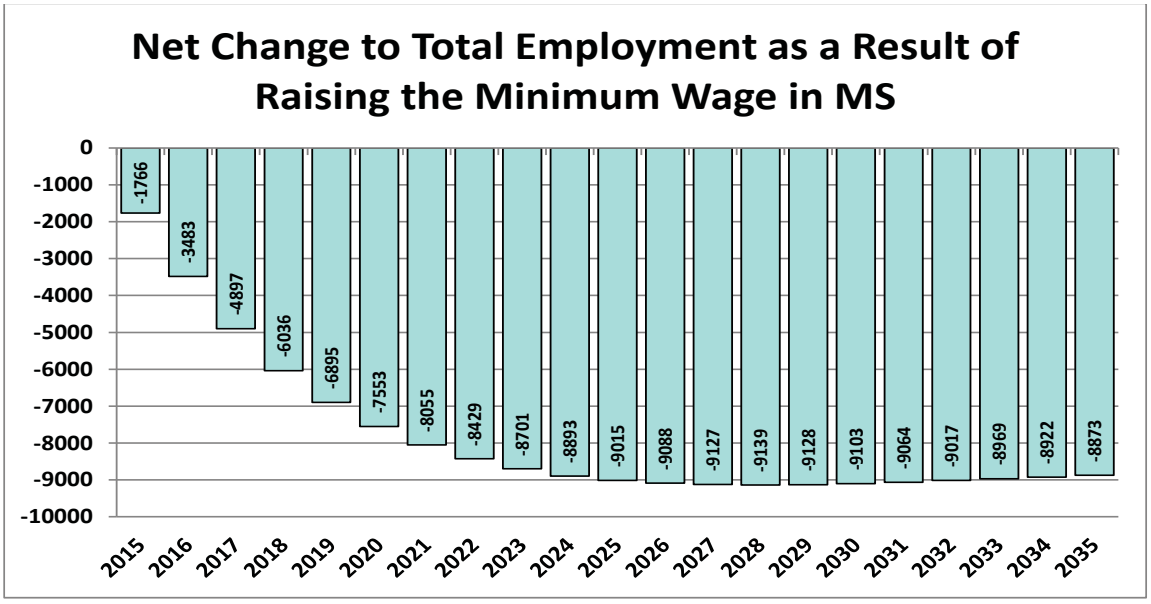
Estimated total annual wage increase for hourly employment from raising the minimum wage to $10.10 is $494.6 million. Approximately 53% of that total is generated by the increase in the three wage rate ranges of below $7.25 per hour, at $7.25 per hour and $7.26 to $9.25 per hour.

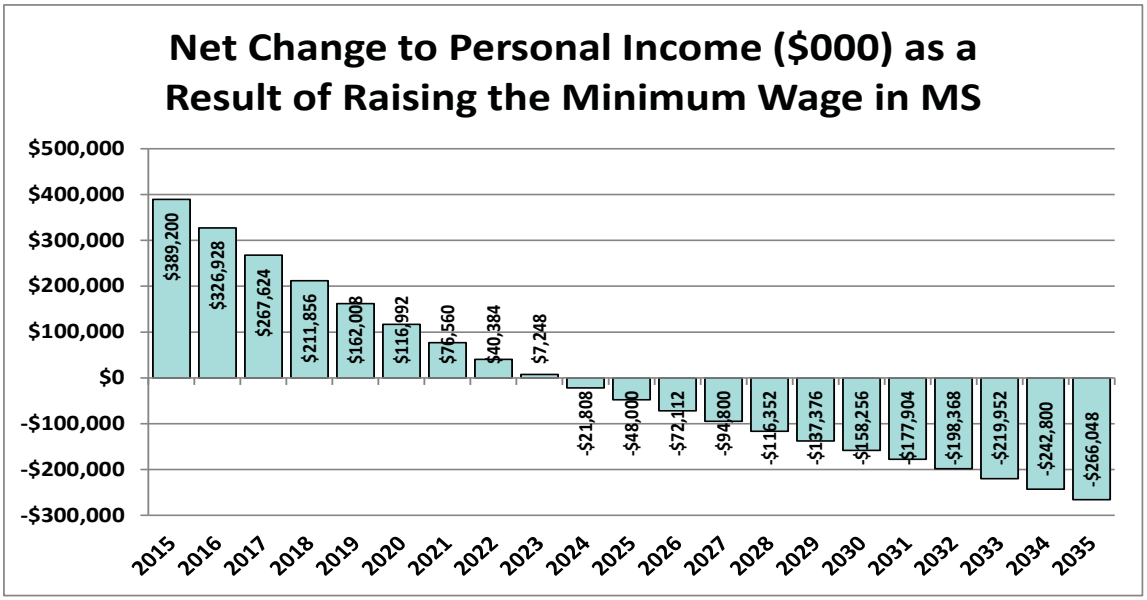
Economic Analysis Results

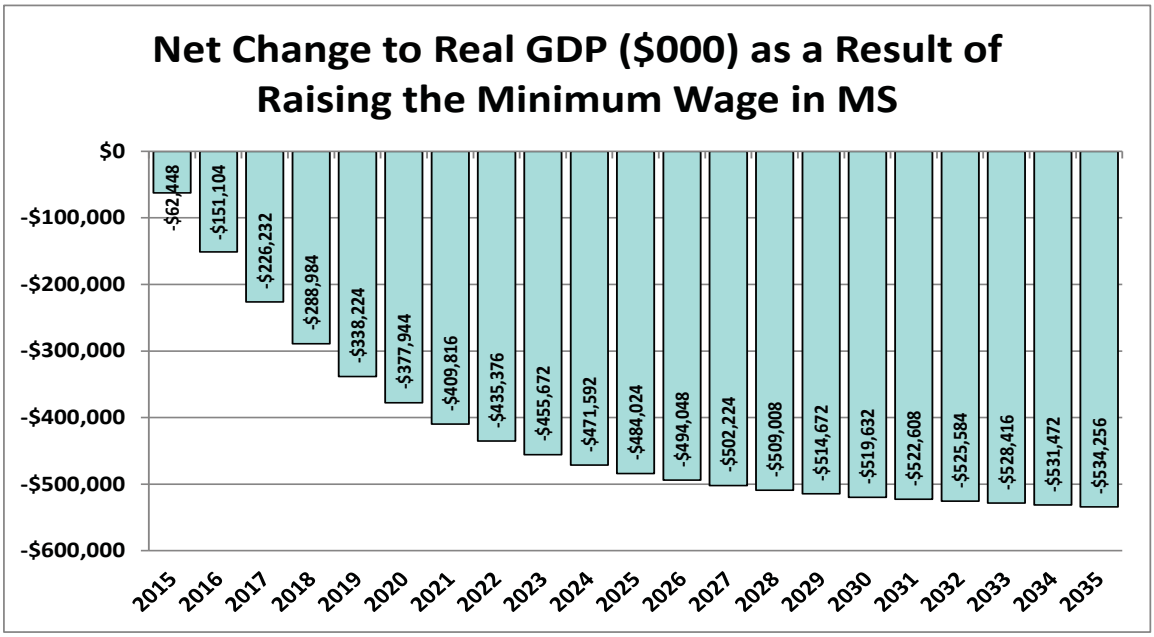
Using the Mississippi REMI economic model with estimates for total annual wage increase for each industry sector while omitting any inflation increases in future years, it was determined that raising the minimum wage in Mississippi to $10.10 would: (1) increase the price of consumer goods; (2) reduce employment and personal income; and (3) slow the growth of gross state product.

Specifically, the REMI model predicted that raising the minimum wage in Mississippi from $7.25 per hour to $10.10 beginning in 2015 would result in a loss of 9,139 jobs, and generate losses in real personal income totaling $274 million, by 2028. This loss of jobs and personal income will be reflected in slower economic growth lowering the state's Gross State product $589 million by 2028.

The following graphs depict Mississippi job loss, income and GDP estimates over time when the minimum wage is increased to $10.10 beginning in 2015.







While the REMI model predicted that total wages and salary disbursements would increase by $474 million and real person income would increase $177 million in the first year of the minimum wage increase, by 2018 the change in total real personal income becomes negative by $1 million and the change in real disposable personal income becomes negative by $5 million.

Of the 9,139 jobs predicted to be lost in 2028, the following table lists the job loss by major economic sector.

While the very short term effect of a minimum wage increase might be appealing to many people including those that would receive higher wages, in the longer term, lower-wage jobs will be lost, personal income reduced, and gross state product lowered.

Major Economic Sector (In year 2028)	Jobs Lost
Accommodation and Food Services	-2047
Other Services, except Public Administration	-1278
Administrative and Waste Management Services	-1084
Retail Trade	-934
State and Local	-861
Health Care and Social Assistance	-633
Construction	-568
Professional, Scientific, and Technical Services	-394
Real Estate and Rental and Leasing	-291
Arts, Entertainment, and Recreation	-245
Finance and Insurance	-175
Manufacturing	-165
Transportation and Warehousing	-157
Educational Services	-95
Wholesale Trade	-85
Forestry, Fishing, and Related Activities	-59
Information	-23
Management of Companies and Enterprises	-17
Utilities	-15
Mining	-13