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Economic Impact Analysis of Proposed Minimum Wage Increases on Pennsylvania Small Businesses and Their Employees

This report analyzes the potential economic impact of implementing two proposals currently under discussion to increase the minimum wage in Pennsylvania. The proposals addressed are those recently offered by Governor Tom Wolf and Representative Patty Kim. In the governor's most recent proposed budget, he proposed increasing the minimum wage from its current level of \$7.25 per hour to \$12.00 per hour as well as tying it to inflation after the adjustment to \$12.00 per hour. Meanwhile, Representative Kim has publicly unveiled a proposal that would increase the minimum wage from \$7.25 per hour to \$12.00 per hour in an initial large jump followed by additional 50-cent annual increases until it reaches \$15.00 per hour by 2023.

Using the Business Size Insight Module (BSIM), a dynamic, multi-region model based on the Regional Economic Models, Inc. (REMI) structural economic forecasting and policy analysis model which integrates input-output, computable general equilibrium, econometric, and economic geography methodologies, it was estimated that over a ten-year period beginning in 2017, the proposed minimum wage schedules would reduce Pennsylvania private sector employment by as much as 403,000 jobs and result in a cumulative reduction in Pennsylvania real output of over \$247 billion over the ten-year forecast window. Fifty-seven percent of the forecast job losses are jobs that would have been in the small business sector of the economy.

Introduction

Employers in all fifty states are required to offer workers a minimum wage in exchange for their labor. The primary federal statute in the area of minimum wages is the Fair Labor Standards Act (FLSA) of 1938 which, as amended, establishes a basic minimum wage that must be paid to covered workers. The current federal minimum wage is \$7.25 per hour. States are permitted to establish their own minimum wages which have the potential to replace the federal rate as the basic minimum wage, provided that the state minimum wage established exceeds the federal rate. The effective minimum wage in the state of Pennsylvania is currently \$7.25 per hour (**Table 1**), equal to the federal rate.

Table 1: Historical Effective Minimum Wage Rates for Non-farm Employment in Pennsylvania

Year	Minimum Wage	Year	Minimum Wage
1976	\$2.30 (per hour)	1997	\$4.75
1977	\$2.30	1998	\$5.15
1978	\$2.65	1999	\$5.15
1979	\$2.90	2000	\$5.15
1980	\$3.10	2001	\$5.15
1981	\$3.35	2002	\$5.15
1982	\$3.35	2003	\$5.15
1983	\$3.35	2004	\$5.15
1984	\$3.35	2005	\$5.15
1985	\$3.35	2006	\$5.15
1986	\$3.35	2007	\$6.25
1987	\$3.35	2008	\$7.15
1988	\$3.35	2009	\$7.15
1989	\$3.35	2010	\$7.25
1990	\$3.35	2011	\$7.25
1991	\$3.80	2012	\$7.25
1992	\$4.25	2013	\$7.25
1993	\$4.25	2014	\$7.25
1994	\$4.25	2015	\$7.25
1995	\$4.25	2016	\$7.25
1996	\$4.25	2017	\$7.25

Source: Department of Labor

Since the end of the Great Recession, the minimum wage in Pennsylvania has remained unchanged. This course was an appropriate policy path as the nation struggled through an unusually sluggish recovery from the 2007/8 financial crisis, housing bubble crash, and related economic turmoil. With the labor market signaling that it has at last largely recovered from the recession (earlier this year, the state unemployment rate fell under five percent for the first time

since 2008), some state policymakers believe now is an appropriate time to raise the state minimum wage.

Two proposals currently being discussed are: (a) an abrupt increase in the minimum wage from its current level of \$7.25 per hour to \$12.00 per hour with cost of living adjustments applied to the minimum wage in future years, and (b) an initial jump in the minimum wage from \$7.25 per hour to \$12.00 per hour followed by additional 50-cent annual increases until it reaches \$15.00 per hour by 2023. It is unclear whether the minimum wage would be tied to inflation in future years for this second proposal. Regardless, both of these proposals advocate (at least) an immediate and abrupt near doubling of the minimum wage in stark contradiction with policy for the past several years.

This brief report quantifies the potential economic impacts implementation of the proposed minimum wage increases might have on Pennsylvania small businesses and their employees by using the Business Size Insight Module. The BSIM is a dynamic, multi-region model based on the Regional Economic Models, Inc. (REMI) structural economic forecasting and policy analysis model which integrates input-output, computable general equilibrium, econometric, and economic geography methodologies. The underlying mechanics of the REMI model are based on decades of peer-reviewed literature.¹ The model is used by numerous clients in both the private and public sectors.² The BSIM is a customized version of the REMI model that has the unique ability to forecast the economic impact of public policy and proposed legislation on different categories of U.S. businesses differentiated by employee-size-of-firm. Forecast variables include levels of private sector employment and real output. By comparing simulation results for scenarios which include proposed or yet-to-be-implemented policy changes with the model's baseline forecast, the BSIM is able to obtain estimates of how these policy changes would impact employer firms and their employees.

¹ A list of the peer-reviewed literature is available at <http://www.remi.com/download/model-equations-v2-0?wpdmdl=7783>. The list of references includes articles published in the [American Economic Review](#) and [The Review of Economics and Statistics](#).

² The REMI model is used by a diverse group of clients spanning academia, private consulting firms, local and regional governments, and nonprofits, to name a few categories. A list of clients that use the REMI model is available at <http://www.remi.com/clients>. The list has included consultancies like Boston Consulting Group and Ernst and Young, educational institutions like the Massachusetts Institute of Technology, nonprofit institutions like AARP and the Urban Institute, and federal, regional, and local government agencies.

Description of New Employer Costs Under the Proposed Minimum Wage Increase in Pennsylvania

Minimum wage increases raise the cost of labor for employers.³ The proposed increases in the Pennsylvania minimum wage directly raise the cost of labor by mandating an immediate increase to the state minimum wage from \$7.25 per hour to \$12.00 per hour. Implementation of both proposals is assumed to begin this year with the initial jump in the minimum wage expected to occur on July 1 of this year. Subsequent increases in the minimum wage in future years, whether due to cost of living adjustments or by mandated \$0.50 per year increases until the minimum wage reaches \$15.00 per hour, as per Representative Kim’s proposal, are assumed to take effect on January 1 in years 2018 and beyond. The cost of living adjustments would be calculated using the percentage change in the Consumer Price Index for All Urban Consumers (CPI-U) for Pennsylvania, New Jersey, Delaware, and Maryland.

Since 2010, inflation in Pennsylvania and neighboring regions has averaged approximately 1.4 percent (**Chart 1**). Although inflation has exhibited some volatility since the Great Recession, it has been relatively stable compared to the wild swings experienced during the recession. Inflation most recently peaked in mid-2011. Between then and late 2015, inflation experienced a steady decline, eventually reaching deflationary levels. (The year-over-year percentage change in CPI-U in October 2015 was -0.5 percent.) Since then, inflation has risen quickly, hitting a near-term peak of 2.1 percent in February 2017 before dropping to its current level of 1.3 percent. For this analysis, three different inflation scenarios were considered: no inflation, two percent inflation, and four percent inflation. These three scenarios capture the possible paths that cost of living adjustments might take should inflation reach and persist at some of the rates it has reached in recent history.

³ Good overviews of the literature on the minimum wage can be found in:

Brown, Charles, Curtis Gilroy, and Andrew Cohen, “The Effect of the Minimum Wage on Employment and Unemployment: A Survey,” NBER Working Paper No. 846, January 1982;

Neumark, David and William Wascher, “Minimum Wages, Labor Market Institutions, and Youth Employment: A Cross-National Analysis,” *Industrial and Labor Relations Review*, Vol. 57, No. 2, January 2004.



Chart 1

Raising the minimum wage to \$12.00 per hour from its current level is equivalent to raising the cost of labor for employers of minimum wage workers by 66 percent. Increasing the minimum wage to \$15.00 per hour is equivalent to raising the cost of this class of labor by 107 percent. These increases to the cost of labor are not inconsequential. According to the Bureau of Labor Statistics, there are 73,000 workers in Pennsylvania who currently earn the minimum wage and would be directly and immediately affected by an increase in the state minimum wage.⁴

Moreover, this increase in the Pennsylvania minimum wage would have a substantial impact on the cash wage that employers must pay to “tipped” employees. According to the U.S. Department of Labor (DOL), tipped employees are employees who “customarily and regularly receive more than \$30 per month in tips.”⁵ Employers may use tips received by such employees as a credit against their minimum wage obligations to the employees, provided that a minimum cash wage, currently set to \$2.13 per hour at the federal level, is also paid to the employees.

⁴ “Characteristics of Minimum Wage Workers: 2016,” Table 3, Bureau of Labor Statistics, <http://www.bls.gov/opub/reports/minimum-wage/2016/pdf/home.pdf>.

⁵ For detailed information on tipped employees, a useful resource is the DOL fact sheet available here: <http://www.dol.gov/whd/regs/compliance/whdfs15.pdf>.

States have the option of establishing their own cash wage. The cash wage in Pennsylvania is currently set to \$2.83 per hour, just slightly higher than the federal minimum. According to the Bureau of Labor Statistics, there are 71,000 Pennsylvania workers who earn below the minimum wage. Tipped employees are required by law to earn the minimum wage through a sum of cash wages, tips, food, and lodging. While Governor Wolf’s proposal does not address tipped employees, Representative Kim’s proposal does by mandating that tipped workers be paid a minimum cash wage equal to the minimum wage to be received by employees at businesses with fewer than 25 employees. In other words, Representative Kim’s proposal would increase the cash wage for tipped workers to \$9.00 per hour effective July 1, 2017 with annual increases of 50 cents until it reaches \$12.00 per hour in 2023, after which point the cash wage would be subject to cost of living adjustments as determined by the rate of inflation captured by a regional measure of the consumer price index.

Table 2: Pennsylvania Minimum Wage Trajectories Under Governor Wolf’s Proposal and Representative Kim’s Proposal

Year	Hypothetical Minimum Wage Schedule under Governor Wolf’s Proposal (0% Inflation)	Hypothetical Minimum Wage Schedule under Governor Wolf’s Proposal (2% Inflation)	Hypothetical Minimum Wage Schedule under Governor Wolf’s Proposal (4% Inflation)	Hypothetical Minimum Wage Schedule under Representative Kim’s Proposal (0% Inflation)
2017 (Pre-July)	\$7.25	\$7.25	\$7.25	\$7.25
2017 (July-Dec)	\$12.00	\$12.00	\$12.00	\$12.00
2018	\$12.00	\$12.24	\$12.48	\$12.50
2019	\$12.00	\$12.48	\$12.98	\$13.00
2020	\$12.00	\$12.73	\$13.50	\$13.50
2021	\$12.00	\$12.99	\$14.04	\$14.00
2022	\$12.00	\$13.25	\$14.60	\$14.50
2023	\$12.00	\$13.51	\$15.18	\$15.00
2024	\$12.00	\$13.78	\$15.79	\$15.00
2025	\$12.00	\$14.06	\$16.42	\$15.00
2026	\$12.00	\$14.34	\$17.08	\$15.00

Table 3: Percentage Increase in Pennsylvania Minimum Wage Under Governor Wolf’s Proposal and Representative Kim’s Proposal

Year	Hypothetical Minimum Wage Schedule under Governor Wolf’s Proposal (0% Inflation)	Hypothetical Minimum Wage Schedule under Governor Wolf’s Proposal (2% Inflation)	Hypothetical Minimum Wage Schedule under Governor Wolf’s Proposal (4% Inflation)	Hypothetical Minimum Wage Schedule under Representative Kim’s Proposal (0% Inflation)
2017 (July-Dec)	66%	66%	66%	66%
2018	66%	69%	72%	72%
2019	66%	72%	79%	79%
2020	66%	76%	86%	86%
2021	66%	79%	94%	93%
2022	66%	83%	101%	100%
2023	66%	86%	109%	107%
2024	66%	90%	118%	107%
2025	66%	94%	127%	107%
2026	66%	98%	136%	107%

Besides tipped employees, another issue a modeler must concern himself with when modeling an increase in the state minimum wage is business size exemptions. Some states exempt businesses of a certain size from minimum wage requirements. For example, Illinois currently exempts employer firms with three or fewer employees from minimum wage laws (although a legislative proposal to increase the minimum wage in that state currently under discussion would eliminate that exemption). Governor Wolf’s proposal would mandate a uniform increase in the minimum wage for employers of all sizes. Representative Kim’s proposal would also mandate an increase in the minimum wage for employers of all sizes, but her proposal takes into consideration the financial realities of smaller firms by mandating a smaller increase in the minimum wage for smaller firms (those with fewer than 25 employees) relative to their larger peers.

A third issue takes the form of potential “emulation effects” associated with individuals earning near (just above) the current minimum wage. Some of these individuals will earn between \$7.25 per hour and the higher wages mandated in subsequent years (beginning with \$12.00 per hour in 2018). In the absence of employer action, these workers will see their wages raised automatically to these new levels contingent upon the passage of the bill. However, wages for these workers may increase to even higher levels if employers attempt to maintain the pre-implementation wage structure and raise wages for these workers to levels above the new minimum wage. Failure to increase the wages of near-minimum-wage earners sufficiently and allowing wage compression to occur may result in workers expressing their dissatisfaction by reducing work effort or leaving. Research suggests that “relative wages are important to workers,” and “firms may find it in their profit-maximizing interest to increase [near-minimum-wage]

workers' wages when minimum wages increase, in an attempt to restore work effort.”⁶ For the modeler, a key concern involves estimating how many workers can be expected to contribute to such emulation effects. Based upon state-level data from the Bureau of Labor Statistics, for this analysis, it was adjudged that, for Governor Wolf's proposal, 30 percent of Pennsylvania's private sector employees less those individuals earning at or below the minimum wage would also see per capita raises equal to the dollar amount in wage increases experienced by workers earning *at* the minimum wage in years 2018 and beyond.⁷ For Representative Kim's proposal, the assumption was that 50 percent of workers would experience wage increases. That these percentages are this high is a consequence of the very large proposed increases in the state minimum wage that would cover a commensurately large fraction of the working population.⁸

Besides the direct cost of higher wages in an increased minimum wage scenario, there are significant additional employer costs in the form of additional payroll taxes that must be paid on wage differentials. In general, an employer's share of payroll taxes equals 7.65 percent of employee wages and salary. Of this 7.65 percent, 6.2 percentage points are intended to help fund old age, survivors, and disability insurance, and 1.45 percentage points go toward helping to pay for Medicare hospital insurance. Employers can expect to pay more in payroll taxes as a consequence of a minimum wage increase.

No Changes to Government Demand

Given that a mandated minimum wage has been in effect for decades, it is assumed that government mechanisms to monitor compliance with the statute are established and well-developed. An increase in the minimum wage therefore should not require the development of new government mechanisms or materially increase government administrative costs. Hence, the analysis assumes no projected increases in government demand resulting from the implementation of the proposed minimum wage increase.

⁶ Grossman, Jean Baldwin, “The Impact of the Minimum Wage on Other Wages,” The Journal of Human Resources, Vol. 18, No. 3 (Summer 1983).

⁷ The assumption that wage changes due to emulation effects occur simultaneously with the minimum wage increase is supported by research suggesting that “any substantial emulation effects are not long delayed, which seems plausible because increases in the minimum are [typically] well-advertised in advance.” See Gramlich, Edward M., “Impact of Minimum Wages on Other Wages, Employment, and Family Incomes,” *Brookings Papers on Economic Activity*, The Brookings Institution, 1974, downloadable at: http://www.brookings.edu/~media/projects/bpea/1976%202/1976b_bpea_gramlich_flanagan_wachter.pdf.

⁸ According to the Bureau of Labor Statistics, Pennsylvania wage earners at the 10th percentile earn \$8.94 per hour, while those at the 25th percentile earned \$11.65 per hour. The median wage earner in Pennsylvania earns \$17.63 per hour. Emulation effects can be assumed to occur among workers who earn near (within a few dollars of) the minimum wage. Based on these statistics, somewhere between 25 percent and 50 percent of the wage earning population in Pennsylvania will either be directly impacted by the mandated increases in the minimum wage or be captured in any related emulation effects. For workers who are assumed to experience emulation effects, it is assumed that their wages increase on the same dollar for dollar basis that minimum wage workers experience due to the proposed minimum wage increases, thereby maintaining the same pre-implementation wage structure in terms of dollar differences between workers along the pay scale (even though wage compression still occurs in percentage terms).

Additional Private Spending in the Economy

Consumers in an economy have two choices of what to do with their after-tax income. They can either choose to spend it, thereby increasing consumption within the economy, or they can elect to save it, and in doing so potentially increase investment in the economy. Government stimulus programs frequently focus on transferring wealth to lower-earning individuals because of the strong likelihood that these individuals will elect to spend the additional wealth, producing a consumption-fueled boost to the economy, rather than to save.⁹ Consistent with expectations pertaining to increases in income for low-income workers, this analysis assumes that new additional income received by minimum wage earners is spent (and not saved), leading to an increase in consumption.

In the analysis, the conversion of higher labor costs for employers into increased consumption by workers receiving wage increases occurs automatically due to the way in which wage costs are inputted into the BSIM. Since employer costs described in this analysis derive from an increase in the minimum wage, the costs were inputted into the BSIM under the “Wage Labor Cost” variable. The costs were distributed across different industry categories and different employee-size-of-business categories according to existing industry and business size distributions published in the Census Bureau’s Statistics on U.S. Businesses dataset. This distribution allows the BSIM to generate results for separate employee-size-of-firm categories.

Increases in the “Wage Labor Cost” variable in the BSIM translate directly to increases in the “Compensation Rate” policy variable which is used in intermediate calculations during the simulation process. During simulations, such compensation rate increases are directly “fed back” into the economy in the form of higher consumer spending on the part of workers who now have extra money to spend. Such dynamics are important in a minimum wage simulation since, as mentioned previously, it is believed that during cases involving the transfer of wealth to lower-earning individuals, there is a strong likelihood that these individuals will elect to spend the additional wealth (rather than save), producing a consumption-fueled boost to the economy. Concerns that minimum wage increases may provide a countervailing spending “stimulus” effect to the economy are therefore satisfied automatically in this analysis.¹⁰

⁹ According to the Congressional Budget Office, “increases in disposable income are likely to boost purchases more for lower-income than for higher-income households. That difference arises, at least in part, because a larger share of people in lower-income households cannot borrow as much money as they would wish in order to spend more than they do currently.” See: “The Economic Outlook and Fiscal Policy Choices: Statement of Douglas W. Elmendorf, before the Committee on the Budget, United States Senate,” Congressional Budget Office, September 28, 2010, p. 36.

¹⁰ The fact that the BSIM automatically accounts for an increase in consumer spending as a consequence of an increase in the “Wage Labor Cost” variable is an important point that should not be missed. That increased consumption is automatically accounted for by the model in an analysis of a minimum wage increase means that exogenous increases in private sector demand are unnecessary for a model to be complete. Including such exogenous increases makes the resulting forecasts conservative.

Simulation Results: Governor Wolf’s Proposal

BSIM simulation results for the modeled scenario in which Governor Wolf’s minimum wage proposal becomes law are provided below. All employment figures are expressed as number of employees, while output figures are expressed as billions of 2015 dollars. Under the above assumptions, job losses forecast in year 2026 range from 138,000 to 216,000, depending on the rate of inflation in coming years (**Table 4, Table 5, Table 6**). More precisely, the BSIM forecasts that there will be 138,000 to 216,000 fewer jobs in 2026 due to the governor’s mandated increase in the cost of labor than there otherwise would have been (if the minimum wage was not increased). Approximately 57 percent of the forecast jobs lost are jobs that would have been in the small business sector of the economy. At a sectoral level, the retail trade and accommodation and food services industries are forecast to experience significant job losses. The BSIM forecasts that in 2026, assuming a two percent inflation rate over the coming decade, there will be over 22,000 fewer jobs in retail and over 28,000 fewer jobs in accommodation and food services.

In addition to forecast reductions in employment, real output¹¹ is also projected to decrease by between \$16 billion and \$25 billion by 2026 (**Table 7, Table 8, Table 9**). Over the ten-year forecast window, the *cumulative* real output could exceed \$130 billion (**Table 12**). Roughly half of the cumulative reduction in real output is expected to occur in the small business sector of the economy.

Table 4: Employment Difference from Baseline (No. of Employees) Under Governor Wolf’s Proposal, 0% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	-542	-1,833	-3,647	-5,401	-6,948	-8,134	-9,011	-9,602	-9,969	-10,167	7.3%
5-9 Employees	-658	-2,182	-4,157	-6,015	-7,627	-8,846	-9,735	-10,327	-10,689	-10,876	7.8%
10-19 Employees	-640	-2,267	-4,521	-6,686	-8,578	-10,017	-11,066	-11,759	-12,178	-12,388	8.9%
20-99 Employees	-1,597	-5,524	-10,714	-15,562	-19,742	-22,883	-25,160	-26,657	-27,559	-28,014	20.2%
100-499 Employees	-910	-3,549	-7,217	-10,524	-13,313	-15,373	-16,840	-17,783	-18,335	-18,591	13.4%
500 + Employees	-3,137	-12,522	-24,868	-35,241	-43,632	-49,620	-53,780	-56,392	-57,912	-58,606	42.3%
< 20 Employees	-1,840	-6,282	-12,325	-18,102	-23,153	-26,997	-29,812	-31,688	-32,836	-33,431	24.1%
< 100 Employees	-3,437	-11,806	-23,039	-33,664	-42,895	-49,880	-54,972	-58,345	-60,395	-61,445	44.3%
< 500 Employees	-4,347	-15,355	-30,256	-44,188	-56,208	-65,253	-71,812	-76,128	-78,730	-80,036	57.7%
All Firms	-7,484	-27,877	-55,124	-79,429	-99,840	-114,873	-125,592	-132,520	-136,642	-138,642	100.0%

¹¹ The term “output” refers to the aggregate output of the Pennsylvania economy (PA gross domestic product (GDP)). GDP has three possible definitions: (1) the value of final goods and services produced in an economy during a given period (as opposed to raw materials or intermediate goods which are produced or sourced earlier in the production process), (2) the sum of value added during a given period, or (3) the sum of incomes in the economy during a given period. It is a technical term whose significance may be better understood by the reader if she considers that because of the first definition, output serves as a rough proxy for sales.

Table 5: Employment Difference from Baseline (No. of Employees) Under Governor Wolf's Proposal, 2% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	-542	-1,856	-3,778	-5,721	-7,529	-9,032	-10,258	-11,222	-11,983	-12,581	7.2%
5-9 Employees	-658	-2,223	-4,335	-6,420	-8,339	-9,920	-11,207	-12,220	-13,023	-13,660	7.8%
10-19 Employees	-640	-2,305	-4,710	-7,130	-9,373	-11,228	-12,737	-13,917	-14,846	-15,577	8.9%
20-99 Employees	-1,597	-5,626	-11,183	-16,635	-21,629	-25,730	-29,058	-31,662	-33,727	-35,364	20.1%
100-499 Employees	-910	-3,606	-7,523	-11,246	-14,591	-17,307	-19,487	-21,181	-22,519	-23,573	13.4%
500 + Employees	-3,137	-12,751	-26,010	-37,836	-48,115	-56,276	-62,769	-67,814	-71,878	-75,147	42.7%
< 20 Employees	-1,840	-6,384	-12,823	-19,271	-25,241	-30,180	-34,202	-37,359	-39,852	-41,818	23.8%
< 100 Employees	-3,437	-12,010	-24,006	-35,906	-46,870	-55,910	-63,260	-69,021	-73,579	-77,182	43.9%
< 500 Employees	-4,347	-15,616	-31,529	-47,152	-61,461	-73,217	-82,747	-90,202	-96,098	-100,755	57.3%
All Firms	-7,484	-28,367	-57,539	-84,988	-109,576	-129,493	-145,516	-158,016	-167,976	-175,902	100.0%

Table 6: Employment Difference from Baseline (No. of Employees) Under Governor Wolf's Proposal, 4% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	-542	-1,879	-3,906	-6,036	-8,109	-9,936	-11,528	-12,888	-14,076	-15,119	7.0%
5-9 Employees	-658	-2,262	-4,510	-6,824	-9,056	-11,014	-12,722	-14,188	-15,480	-16,624	7.7%
10-19 Employees	-640	-2,341	-4,895	-7,572	-10,173	-12,463	-14,459	-16,165	-17,661	-18,982	8.8%
20-99 Employees	-1,597	-5,726	-11,645	-17,707	-23,536	-28,641	-33,089	-36,898	-40,257	-43,241	20.0%
100-499 Employees	-910	-3,661	-7,826	-11,968	-15,888	-19,292	-22,237	-24,753	-26,974	-28,948	13.4%
500 + Employees	-3,137	-12,975	-27,145	-40,450	-52,688	-63,152	-72,172	-79,914	-86,868	-93,144	43.1%
< 20 Employees	-1,840	-6,482	-13,311	-20,432	-27,338	-33,413	-38,709	-43,241	-47,217	-50,725	23.5%
< 100 Employees	-3,437	-12,208	-24,956	-38,139	-50,874	-62,054	-71,798	-80,139	-87,474	-93,966	43.5%
< 500 Employees	-4,347	-15,869	-32,782	-50,107	-66,762	-81,346	-94,035	-104,892	-114,448	-122,914	56.9%
All Firms	-7,484	-28,844	-59,927	-90,557	-119,450	-144,498	-166,207	-184,806	-201,316	-216,058	100.0%

Table 7: Real Output Difference from Baseline (Billions of 2015 Dollars) Under Governor Wolf's Proposal, 0% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.039	\$0.018	-\$0.133	-\$0.303	-\$0.463	-\$0.597	-\$0.697	-\$0.768	-\$0.812	-\$0.836	5.2%
5-9 Employees	\$0.023	-\$0.026	-\$0.196	-\$0.377	-\$0.545	-\$0.683	-\$0.787	-\$0.858	-\$0.903	-\$0.927	5.8%
10-19 Employees	\$0.023	-\$0.042	-\$0.252	-\$0.475	-\$0.682	-\$0.852	-\$0.979	-\$1.067	-\$1.122	-\$1.151	7.2%
20-99 Employees	\$0.001	-\$0.239	-\$0.784	-\$1.335	-\$1.833	-\$2.235	-\$2.534	-\$2.739	-\$2.867	-\$2.934	18.2%
100-499 Employees	-\$0.026	-\$0.271	-\$0.737	-\$1.179	-\$1.566	-\$1.872	-\$2.096	-\$2.248	-\$2.343	-\$2.392	14.9%
500 + Employees	-\$0.119	-\$1.057	-\$2.690	-\$4.132	-\$5.346	-\$6.284	-\$6.957	-\$7.411	-\$7.696	-\$7.846	48.8%
< 20 Employees	\$0.085	-\$0.050	-\$0.581	-\$1.155	-\$1.690	-\$2.132	-\$2.463	-\$2.693	-\$2.837	-\$2.914	18.1%
< 100 Employees	\$0.086	-\$0.289	-\$1.365	-\$2.490	-\$3.523	-\$4.367	-\$4.997	-\$5.432	-\$5.704	-\$5.848	36.4%
< 500 Employees	\$0.060	-\$0.560	-\$2.102	-\$3.669	-\$5.089	-\$6.239	-\$7.093	-\$7.680	-\$8.047	-\$8.240	51.2%
All Firms	-\$0.059	-\$1.617	-\$4.792	-\$7.801	-\$10.435	-\$12.523	-\$14.050	-\$15.091	-\$15.743	-\$16.086	100.0%

Table 8: Real Output Difference from Baseline (Billions of 2015 Dollars) Under Governor Wolf's Proposal, 2% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.039	\$0.024	-\$0.130	-\$0.309	-\$0.487	-\$0.646	-\$0.777	-\$0.880	-\$0.961	-\$1.022	5.0%
5-9 Employees	\$0.023	-\$0.022	-\$0.197	-\$0.392	-\$0.583	-\$0.751	-\$0.889	-\$0.999	-\$1.086	-\$1.152	5.6%
10-19 Employees	\$0.023	-\$0.038	-\$0.254	-\$0.495	-\$0.731	-\$0.939	-\$1.110	-\$1.246	-\$1.353	-\$1.435	7.0%
20-99 Employees	\$0.001	-\$0.234	-\$0.804	-\$1.406	-\$1.982	-\$2.485	-\$2.898	-\$3.226	-\$3.488	-\$3.692	18.1%
100-499 Employees	-\$0.026	-\$0.271	-\$0.761	-\$1.250	-\$1.705	-\$2.097	-\$2.416	-\$2.671	-\$2.876	-\$3.037	14.9%
500 + Employees	-\$0.119	-\$1.061	-\$2.788	-\$4.402	-\$5.854	-\$7.082	-\$8.076	-\$8.874	-\$9.526	-\$10.053	49.3%
< 20 Employees	\$0.085	-\$0.036	-\$0.581	-\$1.196	-\$1.801	-\$2.336	-\$2.776	-\$3.125	-\$3.400	-\$3.609	17.7%
< 100 Employees	\$0.086	-\$0.270	-\$1.385	-\$2.602	-\$3.783	-\$4.821	-\$5.674	-\$6.351	-\$6.888	-\$7.301	35.8%
< 500 Employees	\$0.060	-\$0.541	-\$2.146	-\$3.852	-\$5.488	-\$6.918	-\$8.090	-\$9.022	-\$9.764	-\$10.338	50.7%
All Firms	-\$0.059	-\$1.602	-\$4.934	-\$8.254	-\$11.342	-\$14.000	-\$16.166	-\$17.896	-\$19.290	-\$20.391	100.0%

Table 9: Real Output Difference from Baseline (Billions of 2015 Dollars) Under Governor Wolf's Proposal, 4% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.039	\$0.029	-\$0.125	-\$0.314	-\$0.510	-\$0.695	-\$0.856	-\$0.994	-\$1.114	-\$1.217	4.9%
5-9 Employees	\$0.023	-\$0.018	-\$0.198	-\$0.406	-\$0.620	-\$0.819	-\$0.994	-\$1.144	-\$1.277	-\$1.391	5.6%
10-19 Employees	\$0.023	-\$0.034	-\$0.256	-\$0.515	-\$0.780	-\$1.027	-\$1.244	-\$1.431	-\$1.596	-\$1.738	6.9%
20-99 Employees	\$0.001	-\$0.230	-\$0.823	-\$1.477	-\$2.133	-\$2.740	-\$3.273	-\$3.736	-\$4.146	-\$4.507	18.0%
100-499 Employees	-\$0.026	-\$0.271	-\$0.785	-\$1.321	-\$1.846	-\$2.327	-\$2.748	-\$3.116	-\$3.444	-\$3.737	14.9%
500 + Employees	-\$0.119	-\$1.065	-\$2.886	-\$4.673	-\$6.371	-\$7.906	-\$9.246	-\$10.424	-\$11.492	-\$12.458	49.7%
< 20 Employees	\$0.085	-\$0.023	-\$0.579	-\$1.235	-\$1.910	-\$2.541	-\$3.094	-\$3.569	-\$3.987	-\$4.346	17.4%
< 100 Employees	\$0.086	-\$0.253	-\$1.402	-\$2.712	-\$4.043	-\$5.281	-\$6.367	-\$7.305	-\$8.133	-\$8.853	35.3%
< 500 Employees	\$0.060	-\$0.524	-\$2.187	-\$4.033	-\$5.889	-\$7.608	-\$9.115	-\$10.421	-\$11.577	-\$12.590	50.3%
All Firms	-\$0.059	-\$1.589	-\$5.073	-\$8.706	-\$12.260	-\$15.514	-\$18.361	-\$20.845	-\$23.069	-\$25.048	100.0%

Table 10: Cumulative Real Output Difference from Baseline (Billions of 2015 Dollars) Under Governor Wolf's Proposal, 0% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.039	\$0.057	-\$0.076	-\$0.379	-\$0.842	-\$1.439	-\$2.136	-\$2.904	-\$3.716	-\$4.552	4.6%
5-9 Employees	\$0.023	-\$0.003	-\$0.199	-\$0.576	-\$1.121	-\$1.804	-\$2.591	-\$3.449	-\$4.352	-\$5.279	5.4%
10-19 Employees	\$0.023	-\$0.019	-\$0.271	-\$0.746	-\$1.428	-\$2.280	-\$3.259	-\$4.326	-\$5.448	-\$6.599	6.7%
20-99 Employees	\$0.001	-\$0.238	-\$1.022	-\$2.357	-\$4.190	-\$6.425	-\$8.959	-\$11.698	-\$14.565	-\$17.499	17.8%
100-499 Employees	-\$0.026	-\$0.297	-\$1.034	-\$2.213	-\$3.779	-\$5.651	-\$7.747	-\$9.995	-\$12.338	-\$14.730	15.0%
500 + Employees	-\$0.119	-\$1.176	-\$3.866	-\$7.998	-\$13.344	-\$19.628	-\$26.585	-\$33.996	-\$41.692	-\$49.538	50.4%
< 20 Employees	\$0.085	\$0.035	-\$0.546	-\$1.701	-\$3.391	-\$5.523	-\$7.986	-\$10.679	-\$13.516	-\$16.430	16.7%
< 100 Employees	\$0.086	-\$0.203	-\$1.568	-\$4.058	-\$7.581	-\$11.948	-\$16.945	-\$22.377	-\$28.081	-\$33.929	34.6%
< 500 Employees	\$0.060	-\$0.500	-\$2.602	-\$6.271	-\$11.360	-\$17.599	-\$24.692	-\$32.372	-\$40.419	-\$48.659	49.6%
All Firms	-\$0.059	-\$1.676	-\$6.468	-\$14.269	-\$24.704	-\$37.227	-\$51.277	-\$66.368	-\$82.111	-\$98.197	100.0%

Table 11: Cumulative Real Output Difference from Baseline (Billions of 2015 Dollars) Under Governor Wolf's Proposal, 2% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.039	\$0.063	-\$0.067	-\$0.376	-\$0.863	-\$1.509	-\$2.286	-\$3.166	-\$4.127	-\$5.149	4.5%
5-9 Employees	\$0.023	\$0.001	-\$0.196	-\$0.588	-\$1.171	-\$1.922	-\$2.811	-\$3.810	-\$4.896	-\$6.048	5.3%
10-19 Employees	\$0.023	-\$0.015	-\$0.269	-\$0.764	-\$1.495	-\$2.434	-\$3.544	-\$4.790	-\$6.143	-\$7.578	6.7%
20-99 Employees	\$0.001	-\$0.233	-\$1.037	-\$2.443	-\$4.425	-\$6.910	-\$9.808	-\$13.034	-\$16.522	-\$20.214	17.7%
100-499 Employees	-\$0.026	-\$0.297	-\$1.058	-\$2.308	-\$4.013	-\$6.110	-\$8.526	-\$11.197	-\$14.073	-\$17.110	15.0%
500 + Employees	-\$0.119	-\$1.180	-\$3.968	-\$8.370	-\$14.224	-\$21.306	-\$29.382	-\$38.256	-\$47.782	-\$57.835	50.8%
< 20 Employees	\$0.085	\$0.049	-\$0.532	-\$1.728	-\$3.529	-\$5.865	-\$8.641	-\$11.766	-\$15.166	-\$18.775	16.5%
< 100 Employees	\$0.086	-\$0.184	-\$1.569	-\$4.171	-\$7.954	-\$12.775	-\$18.449	-\$24.800	-\$31.688	-\$38.989	34.2%
< 500 Employees	\$0.060	-\$0.481	-\$2.627	-\$6.479	-\$11.967	-\$18.885	-\$26.975	-\$35.997	-\$45.761	-\$56.099	49.2%
All Firms	-\$0.059	-\$1.661	-\$6.595	-\$14.849	-\$26.191	-\$40.191	-\$56.357	-\$74.253	-\$93.543	-\$113.934	100.0%

Table 12: Cumulative Real Output Difference from Baseline (Billions of 2015 Dollars) Under Governor Wolf's Proposal, 4% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.039	\$0.068	-\$0.057	-\$0.371	-\$0.881	-\$1.576	-\$2.432	-\$3.426	-\$4.540	-\$5.757	4.4%
5-9 Employees	\$0.023	\$0.005	-\$0.193	-\$0.599	-\$1.219	-\$2.038	-\$3.032	-\$4.176	-\$5.453	-\$6.844	5.2%
10-19 Employees	\$0.023	-\$0.011	-\$0.267	-\$0.782	-\$1.562	-\$2.589	-\$3.833	-\$5.264	-\$6.860	-\$8.598	6.6%
20-99 Employees	\$0.001	-\$0.229	-\$1.052	-\$2.529	-\$4.662	-\$7.402	-\$10.675	-\$14.411	-\$18.557	-\$23.064	17.7%
100-499 Employees	-\$0.026	-\$0.297	-\$1.082	-\$2.403	-\$4.249	-\$6.576	-\$9.324	-\$12.440	-\$15.884	-\$19.621	15.0%
500 + Employees	-\$0.119	-\$1.184	-\$4.070	-\$8.743	-\$15.114	-\$23.020	-\$32.266	-\$42.690	-\$54.182	-\$66.640	51.1%
< 20 Employees	\$0.085	\$0.062	-\$0.517	-\$1.752	-\$3.662	-\$6.203	-\$9.297	-\$12.866	-\$16.853	-\$21.199	16.2%
< 100 Employees	\$0.086	-\$0.167	-\$1.569	-\$4.281	-\$8.324	-\$13.605	-\$19.972	-\$27.277	-\$35.410	-\$44.263	33.9%
< 500 Employees	\$0.060	-\$0.464	-\$2.651	-\$6.684	-\$12.573	-\$20.181	-\$29.296	-\$39.717	-\$51.294	-\$63.884	48.9%
All Firms	-\$0.059	-\$1.648	-\$6.721	-\$15.427	-\$27.687	-\$43.201	-\$61.562	-\$82.407	-\$105.476	-\$130.524	100.0%

Simulation Results: Representative Kim’s Proposal

BSIM simulation results for the modeled scenario in which Representative Kim’s minimum wage proposal becomes law are provided below. Again, all employment figures are expressed as number of employees, while output figures are expressed as billions of 2015 dollars. Under the above assumptions, job losses forecast in year 2026 range from 383,000 to 403,000, depending on the rate of inflation in coming years (**Table 13, Table 14, Table 15**). More precisely, the BSIM forecasts that there will be 383,000 to 403,000 fewer jobs in 2026 due to the proposal’s mandated increase in the cost of labor than there otherwise would have been (if the minimum wage was not increased). Approximately 56 percent of the forecast jobs lost are jobs that would have been in the small business sector of the economy. At a sectoral level, the retail trade and accommodation and food services industries are again forecast to experience significant job losses. The BSIM forecasts that in 2026, assuming a two percent inflation rate over the coming decade, there will be over 51,000 fewer jobs in retail and over 64,000 fewer jobs in accommodation and food services.

Real output is projected to decrease by between \$45 billion and \$48 billion by 2026 (**Table 16, Table 17, Table 18**). Over the ten-year forecast window, the cumulative real output could exceed \$247 billion (**Table 21**). Roughly half of the cumulative reduction in real output is expected to occur in the small business sector of the economy.

Table 13: Employment Difference from Baseline (No. of Employees) Under Representative Kim’s Proposal, 0% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	-792	-2,880	-6,571	-10,523	-14,387	-17,783	-20,697	-23,045	-24,819	-26,034	6.8%
5-9 Employees	-1,056	-3,742	-7,954	-12,334	-16,561	-20,248	-23,412	-25,906	-27,772	-29,038	7.6%
10-19 Employees	-1,002	-3,857	-8,676	-13,782	-18,747	-23,095	-26,823	-29,769	-31,972	-33,459	8.7%
20-99 Employees	-2,583	-9,674	-20,912	-32,524	-43,685	-53,401	-61,727	-68,245	-73,100	-76,364	19.9%
100-499 Employees	-1,442	-6,255	-14,233	-22,230	-29,798	-36,331	-41,897	-46,232	-49,417	-51,505	13.4%
500 + Employees	-5,257	-23,142	-50,708	-76,700	-100,560	-120,806	-137,968	-151,140	-160,695	-166,910	43.5%
< 20 Employees	-2,850	-10,479	-23,201	-36,639	-49,695	-61,126	-70,932	-78,720	-84,563	-88,531	23.1%
< 100 Employees	-5,433	-20,153	-44,113	-69,163	-93,380	-114,527	-132,659	-146,965	-157,663	-164,895	43.0%
< 500 Employees	-6,875	-26,408	-58,346	-91,393	-123,178	-150,858	-174,556	-193,197	-207,080	-216,400	56.5%
All Firms	-12,132	-49,550	-109,054	-168,093	-223,738	-271,664	-312,524	-344,337	-367,775	-383,310	100.0%

Table 14: Employment Difference from Baseline (No. of Employees) Under Representative Kim’s Proposal, 2% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	-792	-2,880	-6,571	-10,523	-14,387	-17,783	-20,697	-23,089	-25,024	-26,543	6.7%
5-9 Employees	-1,056	-3,742	-7,954	-12,334	-16,561	-20,248	-23,412	-25,990	-28,080	-29,731	7.6%
10-19 Employees	-1,002	-3,857	-8,676	-13,782	-18,747	-23,095	-26,823	-29,856	-32,310	-34,240	8.7%
20-99 Employees	-2,583	-9,674	-20,912	-32,524	-43,685	-53,401	-61,727	-68,475	-73,947	-78,279	19.9%
100-499 Employees	-1,442	-6,255	-14,233	-22,230	-29,798	-36,331	-41,897	-46,386	-50,013	-52,875	13.4%
500 + Employees	-5,257	-23,142	-50,708	-76,700	-100,560	-120,806	-137,968	-151,761	-162,987	-171,949	43.7%
< 20 Employees	-2,850	-10,479	-23,201	-36,639	-49,695	-61,126	-70,932	-78,935	-85,414	-90,514	23.0%
< 100 Employees	-5,433	-20,153	-44,113	-69,163	-93,380	-114,527	-132,659	-147,410	-159,361	-168,793	42.9%
< 500 Employees	-6,875	-26,408	-58,346	-91,393	-123,178	-150,858	-174,556	-193,796	-209,374	-221,668	56.3%
All Firms	-12,132	-49,550	-109,054	-168,093	-223,738	-271,664	-312,524	-345,557	-372,361	-393,617	100.0%

Table 15: Employment Difference from Baseline (No. of Employees) Under Representative Kim’s Proposal, 4% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	-792	-2,880	-6,571	-10,523	-14,387	-17,783	-20,697	-23,130	-25,219	-27,024	6.7%
5-9 Employees	-1,056	-3,742	-7,954	-12,334	-16,561	-20,248	-23,412	-26,070	-28,377	-30,396	7.5%
10-19 Employees	-1,002	-3,857	-8,676	-13,782	-18,747	-23,095	-26,823	-29,941	-32,636	-34,985	8.7%
20-99 Employees	-2,583	-9,674	-20,912	-32,524	-43,685	-53,401	-61,727	-68,698	-74,771	-80,109	19.9%
100-499 Employees	-1,442	-6,255	-14,233	-22,230	-29,798	-36,331	-41,897	-46,535	-50,596	-54,181	13.4%
500 + Employees	-5,257	-23,142	-50,708	-76,700	-100,560	-120,806	-137,968	-152,367	-165,242	-176,824	43.8%
< 20 Employees	-2,850	-10,479	-23,201	-36,639	-49,695	-61,126	-70,932	-79,141	-86,232	-92,405	22.9%
< 100 Employees	-5,433	-20,153	-44,113	-69,163	-93,380	-114,527	-132,659	-147,839	-161,003	-172,514	42.8%
< 500 Employees	-6,875	-26,408	-58,346	-91,393	-123,178	-150,858	-174,556	-194,374	-211,599	-226,695	56.2%
All Firms	-12,132	-49,550	-109,054	-168,093	-223,738	-271,664	-312,524	-346,741	-376,841	-403,519	100.0%

Table 16: Real Output Difference from Baseline (Billions of 2015 Dollars) Under Representative Kim’s Proposal, 0% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.096	\$0.115	-\$0.171	-\$0.530	-\$0.908	-\$1.264	-\$1.573	-\$1.846	-\$2.062	-\$2.213	4.8%
5-9 Employees	\$0.063	\$0.017	-\$0.323	-\$0.724	-\$1.139	-\$1.525	-\$1.861	-\$2.151	-\$2.379	-\$2.537	5.6%
10-19 Employees	\$0.066	-\$0.008	-\$0.431	-\$0.931	-\$1.446	-\$1.927	-\$2.346	-\$2.705	-\$2.986	-\$3.181	7.0%
20-99 Employees	\$0.052	-\$0.316	-\$1.450	-\$2.719	-\$3.998	-\$5.179	-\$6.207	-\$7.075	-\$7.746	-\$8.211	18.0%
100-499 Employees	-\$0.015	-\$0.437	-\$1.430	-\$2.477	-\$3.504	-\$4.442	-\$5.257	-\$5.933	-\$6.450	-\$6.803	14.9%
500 + Employees	-\$0.132	-\$1.833	-\$5.384	-\$8.892	-\$12.230	-\$15.236	-\$17.833	-\$19.981	-\$21.605	-\$22.717	49.8%
< 20 Employees	\$0.225	\$0.124	-\$0.925	-\$2.185	-\$3.493	-\$4.716	-\$5.780	-\$6.702	-\$7.427	-\$7.931	17.4%
< 100 Employees	\$0.277	-\$0.192	-\$2.375	-\$4.904	-\$7.491	-\$9.895	-\$11.987	-\$13.777	-\$15.173	-\$16.142	35.4%
< 500 Employees	\$0.262	-\$0.629	-\$3.805	-\$7.381	-\$10.995	-\$14.337	-\$17.244	-\$19.710	-\$21.623	-\$22.945	50.2%
All Firms	\$0.130	-\$2.462	-\$9.189	-\$16.273	-\$23.225	-\$29.573	-\$35.077	-\$39.691	-\$43.228	-\$45.662	100.0%

Table 17: Real Output Difference from Baseline (Billions of 2015 Dollars) Under Representative Kim’s Proposal, 2% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.096	\$0.115	-\$0.171	-\$0.530	-\$0.908	-\$1.264	-\$1.573	-\$1.838	-\$2.057	-\$2.227	4.8%
5-9 Employees	\$0.063	\$0.017	-\$0.323	-\$0.724	-\$1.139	-\$1.525	-\$1.861	-\$2.148	-\$2.385	-\$2.571	5.5%
10-19 Employees	\$0.066	-\$0.008	-\$0.431	-\$0.931	-\$1.446	-\$1.927	-\$2.346	-\$2.702	-\$2.996	-\$3.228	6.9%
20-99 Employees	\$0.052	-\$0.316	-\$1.450	-\$2.719	-\$3.998	-\$5.179	-\$6.207	-\$7.077	-\$7.797	-\$8.370	17.9%
100-499 Employees	-\$0.015	-\$0.437	-\$1.430	-\$2.477	-\$3.504	-\$4.442	-\$5.257	-\$5.943	-\$6.510	-\$6.966	14.9%
500 + Employees	-\$0.132	-\$1.833	-\$5.384	-\$8.892	-\$12.230	-\$15.236	-\$17.833	-\$20.024	-\$21.848	-\$23.332	50.0%
< 20 Employees	\$0.225	\$0.124	-\$0.925	-\$2.185	-\$3.493	-\$4.716	-\$5.780	-\$6.688	-\$7.438	-\$8.026	17.2%
< 100 Employees	\$0.277	-\$0.192	-\$2.375	-\$4.904	-\$7.491	-\$9.895	-\$11.987	-\$13.765	-\$15.235	-\$16.396	35.1%
< 500 Employees	\$0.262	-\$0.629	-\$3.805	-\$7.381	-\$10.995	-\$14.337	-\$17.244	-\$19.708	-\$21.745	-\$23.362	50.0%
All Firms	\$0.130	-\$2.462	-\$9.189	-\$16.273	-\$23.225	-\$29.573	-\$35.077	-\$39.732	-\$43.593	-\$46.694	100.0%

Table 18: Real Output Difference from Baseline (Billions of 2015 Dollars) Under Representative Kim’s Proposal, 4% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.096	\$0.115	-\$0.171	-\$0.530	-\$0.908	-\$1.264	-\$1.573	-\$1.830	-\$2.051	-\$2.236	4.7%
5-9 Employees	\$0.063	\$0.017	-\$0.323	-\$0.724	-\$1.139	-\$1.525	-\$1.861	-\$2.144	-\$2.389	-\$2.599	5.5%
10-19 Employees	\$0.066	-\$0.008	-\$0.431	-\$0.931	-\$1.446	-\$1.927	-\$2.346	-\$2.699	-\$3.005	-\$3.269	6.9%
20-99 Employees	\$0.052	-\$0.316	-\$1.450	-\$2.719	-\$3.998	-\$5.179	-\$6.207	-\$7.079	-\$7.845	-\$8.516	17.9%
100-499 Employees	-\$0.015	-\$0.437	-\$1.430	-\$2.477	-\$3.504	-\$4.442	-\$5.257	-\$5.951	-\$6.568	-\$7.118	14.9%
500 + Employees	-\$0.132	-\$1.833	-\$5.384	-\$8.892	-\$12.230	-\$15.236	-\$17.833	-\$20.065	-\$22.085	-\$23.916	50.2%
< 20 Employees	\$0.225	\$0.124	-\$0.925	-\$2.185	-\$3.493	-\$4.716	-\$5.780	-\$6.673	-\$7.445	-\$8.104	17.0%
< 100 Employees	\$0.277	-\$0.192	-\$2.375	-\$4.904	-\$7.491	-\$9.895	-\$11.987	-\$13.752	-\$15.290	-\$16.620	34.9%
< 500 Employees	\$0.262	-\$0.629	-\$3.805	-\$7.381	-\$10.995	-\$14.337	-\$17.244	-\$19.703	-\$21.858	-\$23.738	49.8%
All Firms	\$0.130	-\$2.462	-\$9.189	-\$16.273	-\$23.225	-\$29.573	-\$35.077	-\$39.768	-\$43.943	-\$47.654	100.0%

Table 19: Cumulative Real Output Difference from Baseline (Billions of 2015 Dollars) Under Representative Kim’s Proposal, 0% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.096	\$0.211	\$0.040	-\$0.490	-\$1.398	-\$2.662	-\$4.235	-\$6.081	-\$8.143	-\$10.356	4.2%
5-9 Employees	\$0.063	\$0.080	-\$0.243	-\$0.967	-\$2.106	-\$3.631	-\$5.492	-\$7.643	-\$10.022	-\$12.559	5.1%
10-19 Employees	\$0.066	\$0.058	-\$0.373	-\$1.304	-\$2.750	-\$4.677	-\$7.023	-\$9.728	-\$12.714	-\$15.895	6.5%
20-99 Employees	\$0.052	-\$0.264	-\$1.714	-\$4.433	-\$8.431	-\$13.610	-\$19.817	-\$26.892	-\$34.638	-\$42.849	17.5%
100-499 Employees	-\$0.015	-\$0.452	-\$1.882	-\$4.359	-\$7.863	-\$12.305	-\$17.562	-\$23.495	-\$29.945	-\$36.748	15.0%
500 + Employees	-\$0.132	-\$1.965	-\$7.349	-\$16.241	-\$28.471	-\$43.707	-\$61.540	-\$81.521	-\$103.126	-\$125.843	51.5%
< 20 Employees	\$0.225	\$0.349	-\$0.576	-\$2.761	-\$6.254	-\$10.970	-\$16.750	-\$23.452	-\$30.879	-\$38.810	15.9%
< 100 Employees	\$0.277	\$0.085	-\$2.290	-\$7.194	-\$14.685	-\$24.580	-\$36.567	-\$50.344	-\$65.517	-\$81.659	33.4%
< 500 Employees	\$0.262	-\$0.367	-\$4.172	-\$11.553	-\$22.548	-\$36.885	-\$54.129	-\$73.839	-\$95.462	-\$118.407	48.5%
All Firms	\$0.130	-\$2.332	-\$11.521	-\$27.794	-\$51.019	-\$80.592	-\$115.669	-\$155.360	-\$198.588	-\$244.250	100.0%

Table 20: Cumulative Real Output Difference from Baseline (Billions of 2015 Dollars) Under Representative Kim’s Proposal, 2% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.096	\$0.211	\$0.040	-\$0.490	-\$1.398	-\$2.662	-\$4.235	-\$6.073	-\$8.130	-\$10.357	4.2%
5-9 Employees	\$0.063	\$0.080	-\$0.243	-\$0.967	-\$2.106	-\$3.631	-\$5.492	-\$7.640	-\$10.025	-\$12.596	5.1%
10-19 Employees	\$0.066	\$0.058	-\$0.373	-\$1.304	-\$2.750	-\$4.677	-\$7.023	-\$9.725	-\$12.721	-\$15.949	6.5%
20-99 Employees	\$0.052	-\$0.264	-\$1.714	-\$4.433	-\$8.431	-\$13.610	-\$19.817	-\$26.894	-\$34.691	-\$43.061	17.5%
100-499 Employees	-\$0.015	-\$0.452	-\$1.882	-\$4.359	-\$7.863	-\$12.305	-\$17.562	-\$23.505	-\$30.015	-\$36.981	15.1%
500 + Employees	-\$0.132	-\$1.965	-\$7.349	-\$16.241	-\$28.471	-\$43.707	-\$61.540	-\$81.564	-\$103.412	-\$126.744	51.6%
< 20 Employees	\$0.225	\$0.349	-\$0.576	-\$2.761	-\$6.254	-\$10.970	-\$16.750	-\$23.438	-\$30.876	-\$38.902	15.8%
< 100 Employees	\$0.277	\$0.085	-\$2.290	-\$7.194	-\$14.685	-\$24.580	-\$36.567	-\$50.332	-\$65.567	-\$81.963	33.4%
< 500 Employees	\$0.262	-\$0.367	-\$4.172	-\$11.553	-\$22.548	-\$36.885	-\$54.129	-\$73.837	-\$95.582	-\$118.944	48.4%
All Firms	\$0.130	-\$2.332	-\$11.521	-\$27.794	-\$51.019	-\$80.592	-\$115.669	-\$155.401	-\$198.994	-\$245.688	100.0%

Table 21: Cumulative Real Output Difference from Baseline (Billions of 2015 Dollars) Under Representative Kim’s Proposal, 4% Inflation

Firm Size	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Percent of Total (2026)
1-4 Employees	\$0.096	\$0.211	\$0.040	-\$0.490	-\$1.398	-\$2.662	-\$4.235	-\$6.065	-\$8.116	-\$10.352	4.2%
5-9 Employees	\$0.063	\$0.080	-\$0.243	-\$0.967	-\$2.106	-\$3.631	-\$5.492	-\$7.636	-\$10.025	-\$12.624	5.1%
10-19 Employees	\$0.066	\$0.058	-\$0.373	-\$1.304	-\$2.750	-\$4.677	-\$7.023	-\$9.722	-\$12.727	-\$15.996	6.5%
20-99 Employees	\$0.052	-\$0.264	-\$1.714	-\$4.433	-\$8.431	-\$13.610	-\$19.817	-\$26.896	-\$34.741	-\$43.257	17.5%
100-499 Employees	-\$0.015	-\$0.452	-\$1.882	-\$4.359	-\$7.863	-\$12.305	-\$17.562	-\$23.513	-\$30.081	-\$37.199	15.1%
500 + Employees	-\$0.132	-\$1.965	-\$7.349	-\$16.241	-\$28.471	-\$43.707	-\$61.540	-\$81.605	-\$103.690	-\$127.606	51.7%
< 20 Employees	\$0.225	\$0.349	-\$0.576	-\$2.761	-\$6.254	-\$10.970	-\$16.750	-\$23.423	-\$30.868	-\$38.972	15.8%
< 100 Employees	\$0.277	\$0.085	-\$2.290	-\$7.194	-\$14.685	-\$24.580	-\$36.567	-\$50.319	-\$65.609	-\$82.229	33.3%
< 500 Employees	\$0.262	-\$0.367	-\$4.172	-\$11.553	-\$22.548	-\$36.885	-\$54.129	-\$73.832	-\$95.690	-\$119.428	48.3%
All Firms	\$0.130	-\$2.332	-\$11.521	-\$27.794	-\$51.019	-\$80.592	-\$115.669	-\$155.437	-\$199.380	-\$247.034	100.0%

Pennsylvania Jobs Lost (Employment Difference from Baseline) by 2026

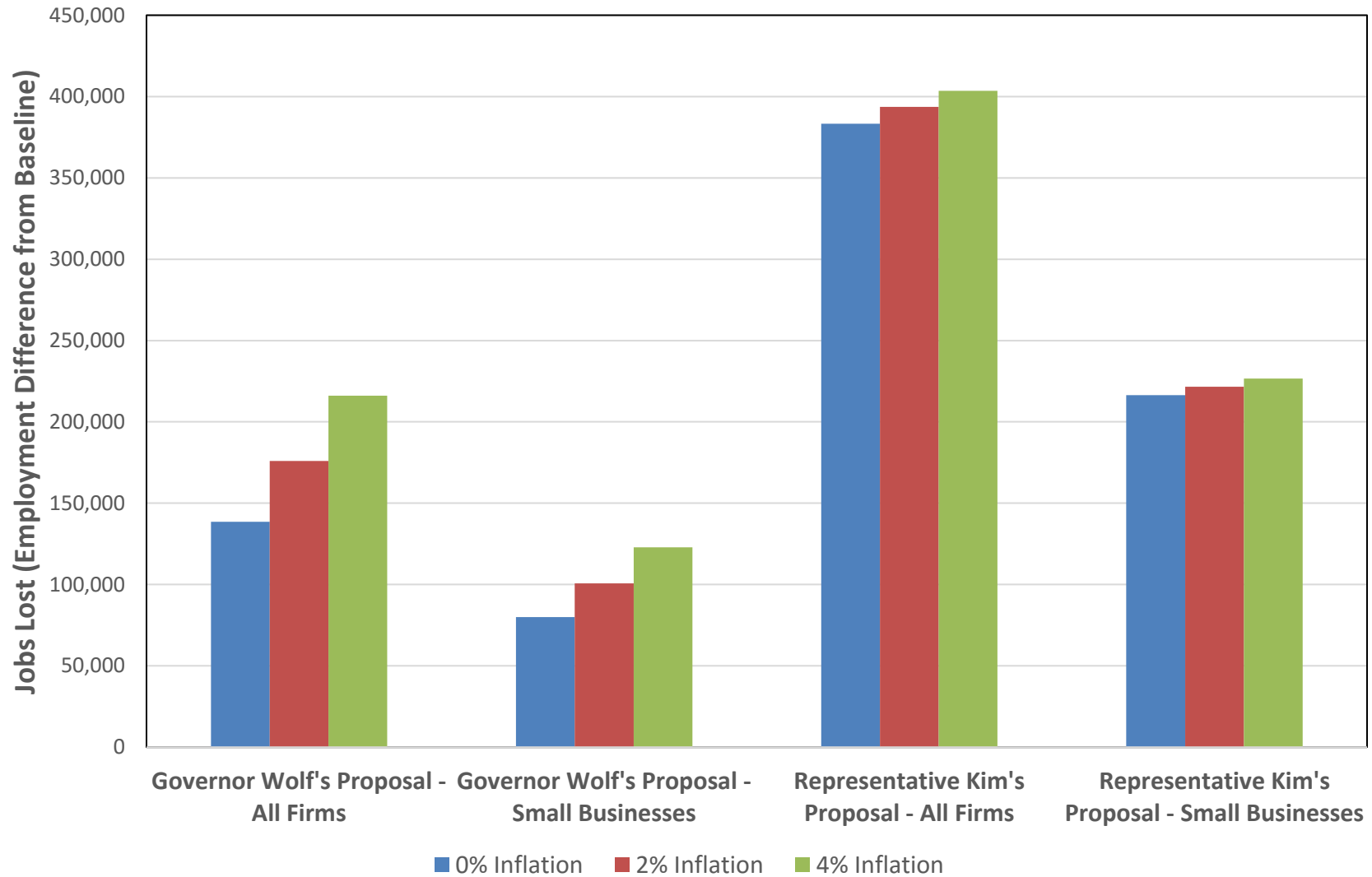


Figure 1

Pennsylvania Jobs Lost (Employment Difference from Baseline) by 2026, Retail Trade and Accomodation and Food Services Industries

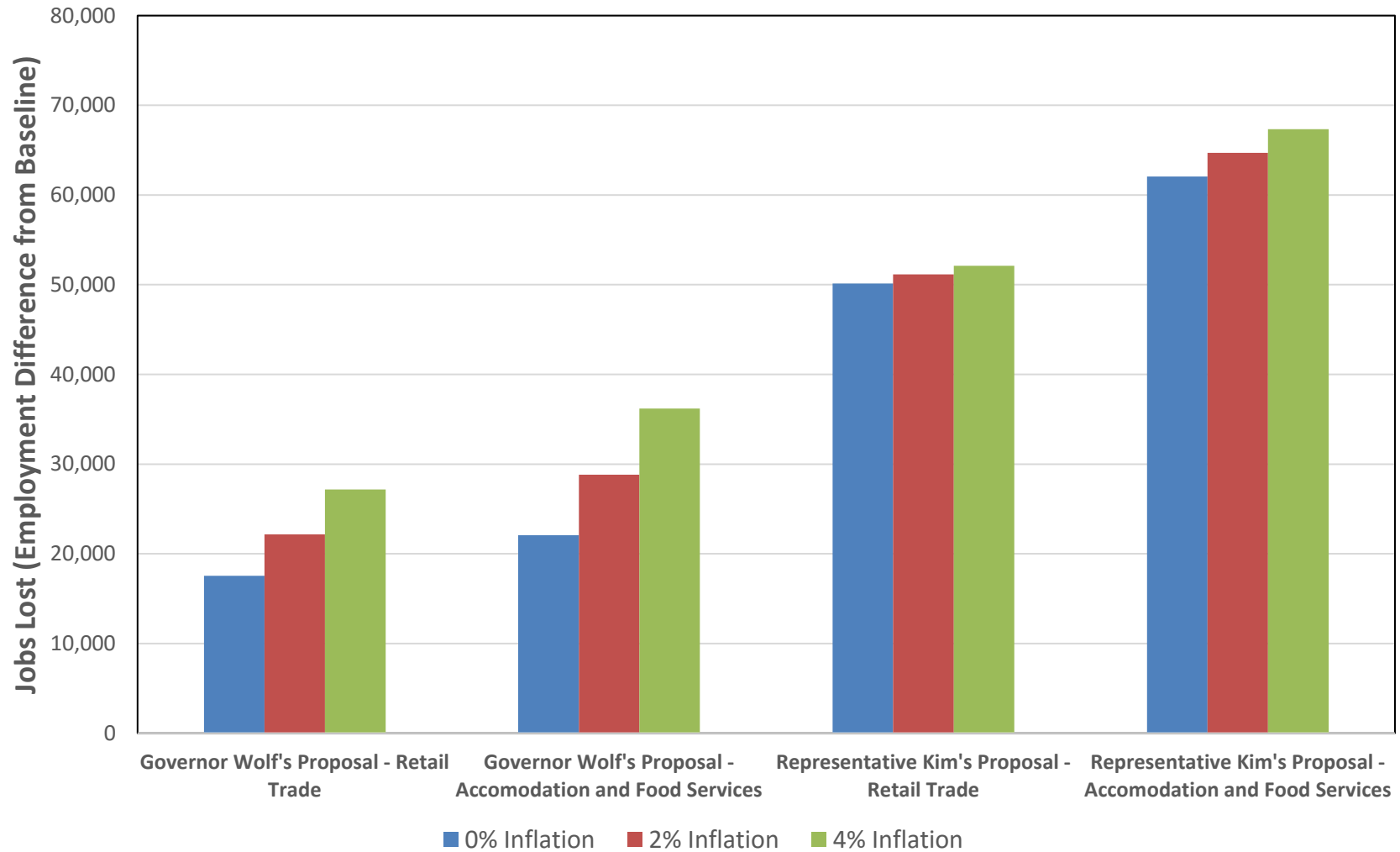


Figure 2

Cumulative Real Output Lost (Billions of 2015 Dollars)

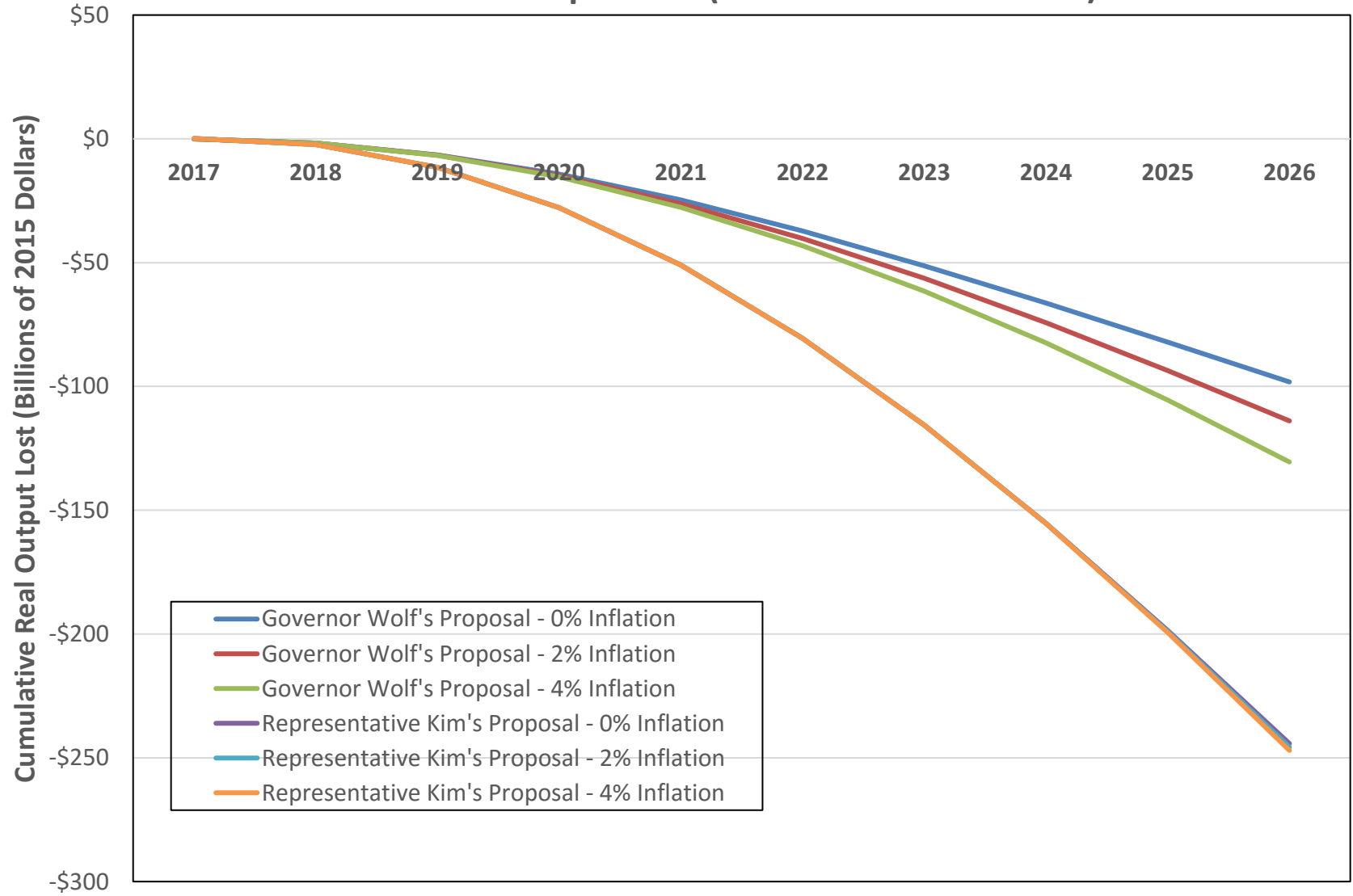


Figure 3

Appendix: Remarks Concerning Alleged Counterfactual Evidence Regarding Minimum Wage Effects on Employment

Research on the economic effects of minimum wage policy consists of a rich literature spanning decades. This body of literature includes studies whose results contradict the basic economic principle of the law of demand, suggesting that increases in the minimum wage have no impact on low-wage employment and may even have a modest positive effect. This section discusses two popular studies within this counterfactual literature and notes certain methodological problems which introduce uncertainty with respect to their findings.

A controversial and well-cited study on the minimum wage dating from the mid-1990s is Card and Krueger's investigation of the impact of the April 1, 1992 increase in the New Jersey minimum wage from \$4.25 to \$5.05 per hour.¹² Card and Krueger used a telephone survey to compare the experiences of 410 fast-food restaurants in New Jersey and Pennsylvania—331 in New Jersey and 79 in eastern Pennsylvania—following the increase in New Jersey's minimum wage. The Pennsylvania restaurants included in the survey served as a control group with which New Jersey restaurants (and their experiences) could be compared since, in the authors' opinions, "New Jersey is a relatively small state with an economy that is closely linked to nearby states" and no contemporary increase in Pennsylvania's minimum wage occurred during the time period studied. In summarizing their findings, the authors claim to have found "no evidence that the rise in New Jersey's minimum wage reduced employment at fast-food restaurants in the state." Contrary to conventional wisdom, the authors even found "that the increase in the minimum wage increased employment." In a follow-up study using different data (from the Bureau of Labor Statistics), the authors moderated their conclusion to the following: "The increase in New Jersey's minimum wage probably had no effect on total employment in New Jersey's fast-food industry, and possibly had a small positive effect."¹³

The motivation for Card and Krueger's follow-up study stems from criticism of the methodology employed in the authors' first study. In particular, concerns about noisy measurement, the unit of measure investigated (critics claimed that the study's focus should have been the number of hours worked by employees, not the number of employees itself), and inconsistencies between Card and Krueger's data set and actual payroll data from fast-food establishments in New Jersey and Pennsylvania incentivized the authors to perform subsequent research. These points aside, other criticisms can be made about Card and Krueger's analysis. First, the authors focused on a relatively small geographic area. Second, the authors focused on fast-food *chains*, which are not the same as the fast-food *industry*, which is comprised of both chains and an independent sector. The independent sector has been observed to be "much more labour intensive than the chain sector."¹⁴ This being the case, it is entirely possible for the chain sector of the fast-food industry to experience negligible effects due to a minimum wage increase, while

¹² Card, David and Alan B. Krueger, "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," The American Economic Review, Vol. 84, No. 4, Sept. 1994, pp. 772-793.

¹³ Card, David and Alan B. Krueger, "Minimum Wage and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania: Reply," The American Economic Review, Vol. 90, No. 5, Dec. 2000, pp. 1397-1420.

¹⁴ Worstall, Tim, "Alan Krueger's Mistake on the Minimum Wage", Forbes, Aug. 31, 2011.

the more labor-intensive independent sector (and the industry as a whole) experiences material negative employment effects due to the minimum wage increase. Third, by focusing on the fast-food industry, Card and Kruger leave out a significant subpopulation of the minimum wage workforce (employed outside of the fast-food industry). Fourth, the New Jersey minimum wage became effective two years after the legislation was passed. It is possible, and perhaps even likely, that some of the reaction among employer firms to the legislation occurred before the new minimum wage came into effect. To the extent that the examined time period excluded some employer's reactions to the minimum wage increase, the change in employment measured by Card and Kruger may be biased upward. Fifth, Card and Kruger focused on nationally-known fast-food enterprises rather than a representative sample of all eating establishments. Such a focus could bias results upward, as national chain restaurants may be better able to absorb wage increases than eating establishments in general. If such is the case, national chain restaurants may even gain market share and expand even as the industry as a whole loses employment.

The second study of some popularity which presents counterfactual evidence on the employment effects of minimum wage policy is much more recent. An article by Allegretto, Dube, and Reich (hereby ADR) published in 2011 asserts that minimum wage increases between 1990 and 2009 had essentially zero impact on teen employment (the authors rule out "any but very small disemployment effects").¹⁵ Their results were obtained using a methodology that accounted for the (according to the authors) prior-to-then ignored "heterogeneous employment patterns that are correlated with selectivity among states with minimum wages." By including control variables for "long-term growth differences among states and for heterogeneous economic shocks," the authors achieve elasticities for employment and hours worked "indistinguishable from zero."

While the approach used by ADR holds some intuitive appeal, a thorough examination of the authors' methodology by Neumark, Salas, and Wascher (hereby NSW) "points to serious problems with [their] research designs."¹⁶ NSW's analysis provides evidence that the tendency for including state-specific time trends into the baseline fixed-effects regression model typically used for minimum wage analysis to eliminate negative employment effects of minimum wages (during the time period studied) is due principally to the strong influence of the recessionary periods of the early 1990s or the Great Recession period. NSW show that when long-term trends are estimated in ways that are not highly sensitive to the business cycle, the estimated effects of minimum wages on teen employment are negative and statistically significant. NSW also address the second methodological technique used by ADR to obtain their counterfactual results, namely, the inclusion of a (Census Division x Period Interaction) term into the regression model. A justification for the inclusion of this term is that omitted factors could drive patterns of teen employment differentially by Census division, and therefore this term should be included to capture those effects. Underlying this approach is the assumption that states within a Census

¹⁵ Allegretto, Sylvia A., Arindrajit Dube, and Michael Reich, "Do Minimum Wages Really Reduce Teen Employment? Accounting for Heterogeneity and Selectivity in State Panel Data," *Industrial Relations*, Vol. 50, No. 2, Apr. 2011, pp. 205-240.

¹⁶ Neumark, David, J.M. Ian Salas, and William Wascher, "Revisiting the Minimum Wage-Employment Debate: Throwing Out the Baby with the Bathwater?", Discussion Paper No. 7166, IZA, January 2013.

division make better controls for states where minimum wages increase than are states in other Census divisions. NSW investigate this claim by utilizing two ranking algorithms to assess whether within-Census-division states truly do make for better controls.¹⁷ The two algorithms include a synthetic control approach and a “ranked prediction error” approach. Both algorithms provide evidence which generally question the rationale for restricting control states to those in the same Census division. In light of these results, NSW conclude that “the evidence still shows that minimum wages pose a tradeoff of higher wages for some against job losses for others.”

¹⁷ The structures of the algorithms are non-trivial and details surrounding them are omitted from this report. Readers interested in learning more about the algorithms should refer to Neumark et al. noted in footnote 16.