Analyzing the Economic Impact of a $15 Minimum Wage Using REMI

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Agenda for Today's Presentation

I. Background

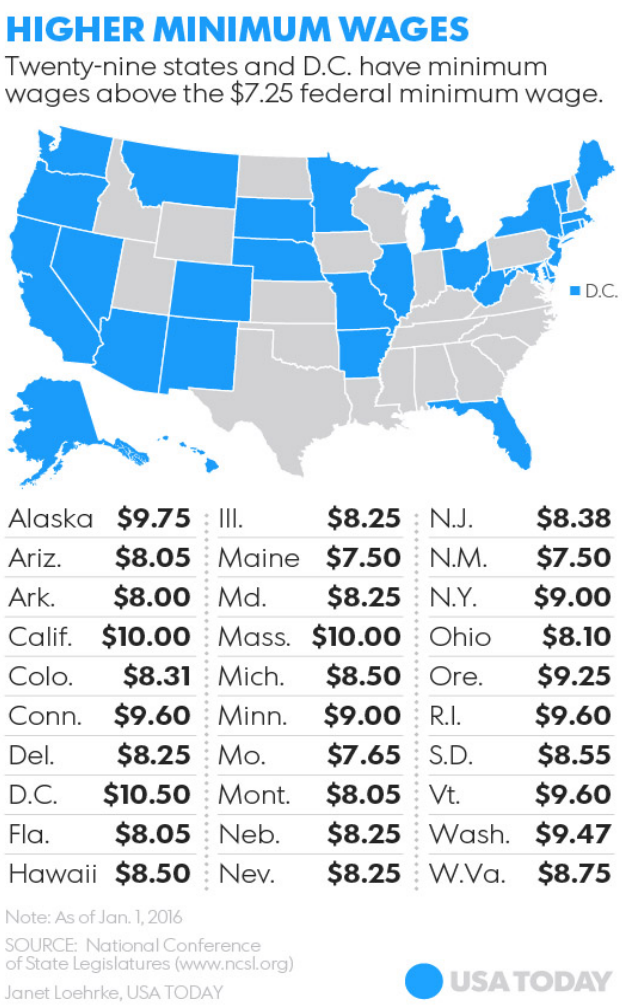
II. Data & Methods

III. Results
   I. Employment Effects
   II. Wage & Salary Effects
   III. Price & Consumption Effects
   IV. Fiscal Effects

IV. Conclusions & Takeaways

I. Background

Current Progress in $15/hour Minimum Wage



- **New York City**, fast-food workers : $15 per hour by 2018 in New York City, and by 2021 in the rest of the state.
- **Buffalo, NY, Mountain View , CA, Missoula, MT and Seattle, WA** on $15 schedule
- **Los Angeles:** $15/hour by 2021
- **Massachusetts**, home health care workers : $15 by 2018
- **California** and **New York State** passed $15 minimum wage increase into law in April, 2016. The minimum wage for California and New York workers will jump to $15 an hour in 2022 and 2021 respectively.
- **DC** Mayor Bowser signed into law the *Fair Shot Minimum Wage Amendment Act of 2016.* DC Minimum wage will be raised to $15 per hour by 2020.

How Do Higher Minimum Wages Impact the DC Economy and DC Residents?

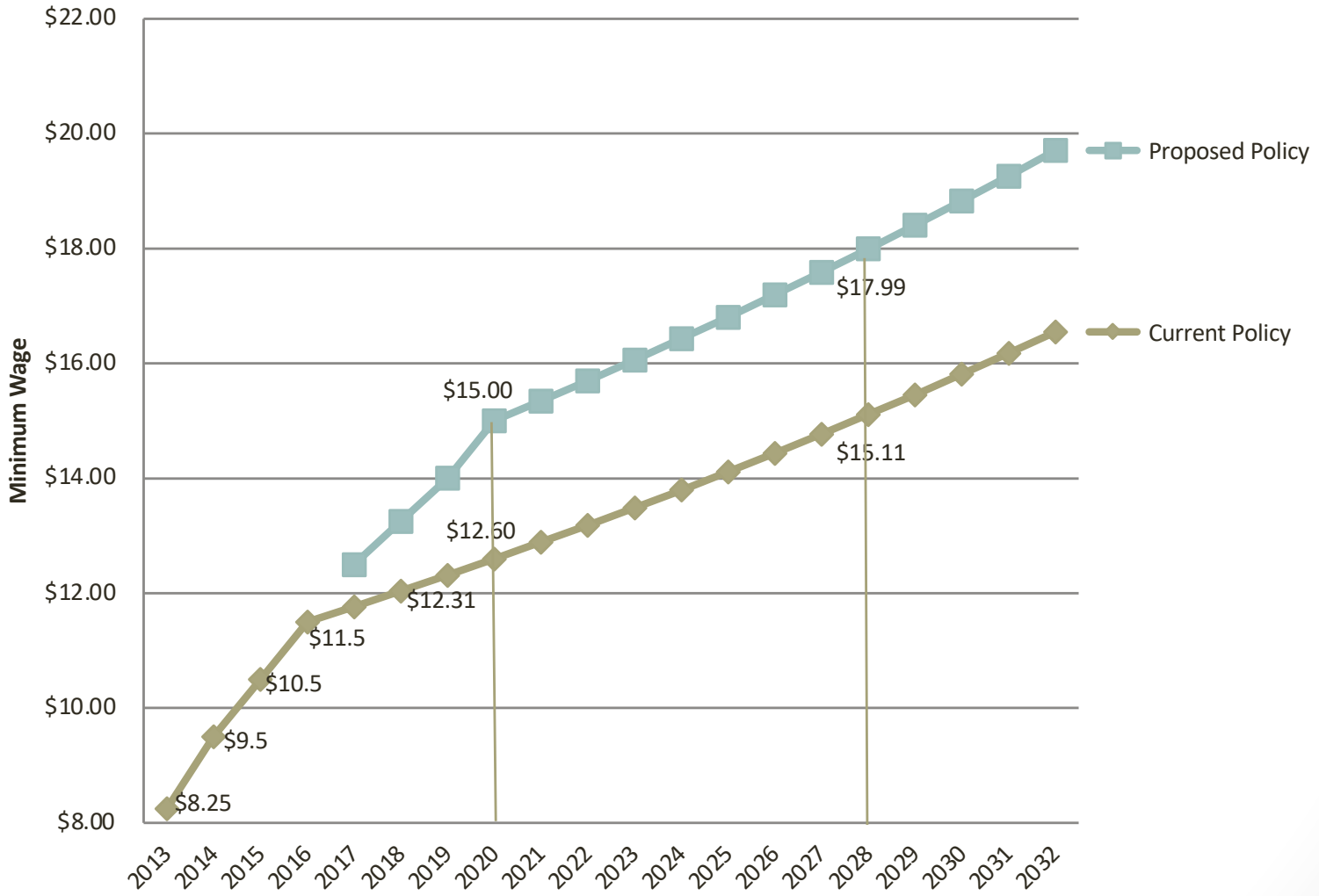
- Pros:
  - Employees in DC businesses will have higher income; more money will be spent, and saved, in DC and the metropolitan area
  - Improved productivity in DC businesses and lower turnover and recruiting costs
- Cons
  - Increase in the cost of doing business (loss of competitiveness) in DC leads to job losses
  - Increases in labor supply from surrounding DC metropolitan counties for DC jobs

Timeline of Current and Future Minimum Wage Policy

Date	Hourly Wage	Annual Full Time Salary *
Prior 8/14	$8.25	$17,160
7/1/2014	$9.50	$19,760
7/1/2015	$10.50	$21,840
7/1/2016	$11.50 **(39% increase v. $8.25)**	$23,920
7/1/2017	$12.50	$26,000
7/1/2018	$13.25	$27,560
7/1/2019	$14.00	$29,120
7/1/2020	$15.00 **(30% increase v. $11.5)**	$31,200

* Based on 40 Hours per Week for Minimum Wage Workers

Current and Proposed DC Minimum Wage Policies



Based on 2.3% projected inflation from 2016 to 2032.

II. Data & Methods

Distribution of Impacted Workers by Wage

Wage Distribution	# All DC Workers	# Resident Workers
Minimum Wage ($8.25)	14,993	5,997
$8.25-$11.5	55,925	22,370
$11.5-$12.5	14,260	5,704
$12.5-$13.5	12,772	5,109
$13.5-$15	17,776	7,111
Sub Total (Direct Impact)	115,727	46,291
$15-$18 (Spillover)	36,144	14,458
Total (With Spillover Effects)	**151,871**	**60,748**
Total Wage and Salary Employment*	751,842	345,573
Percentage of Workers Impacted	20.2%	17.6%

Note: Spillover refers to the fact that employers typically increase the wages of workers slightly above the new minimum wage as well to preserve some level of wage differential

Note: The above figures exclude self employed and proprietors.

Data Source: ACS, BLS and BEA

Gross Impact on Total Wages and Salaries As of 2021

Impact on Private W&S	All DC Employees	DC Residents
Increase in Private Sector W&S (for Workers Earning below $15/hour, $m)	$387.95	$154.78
With Spillover Effects (including W&S between $15 and $18/hour, $m)**	$493.23	$197.29
Total Private WS in 2021($m)	**$53,056**	**$21,222**
Percentage of Impact	**0.93%**	**0.93%**

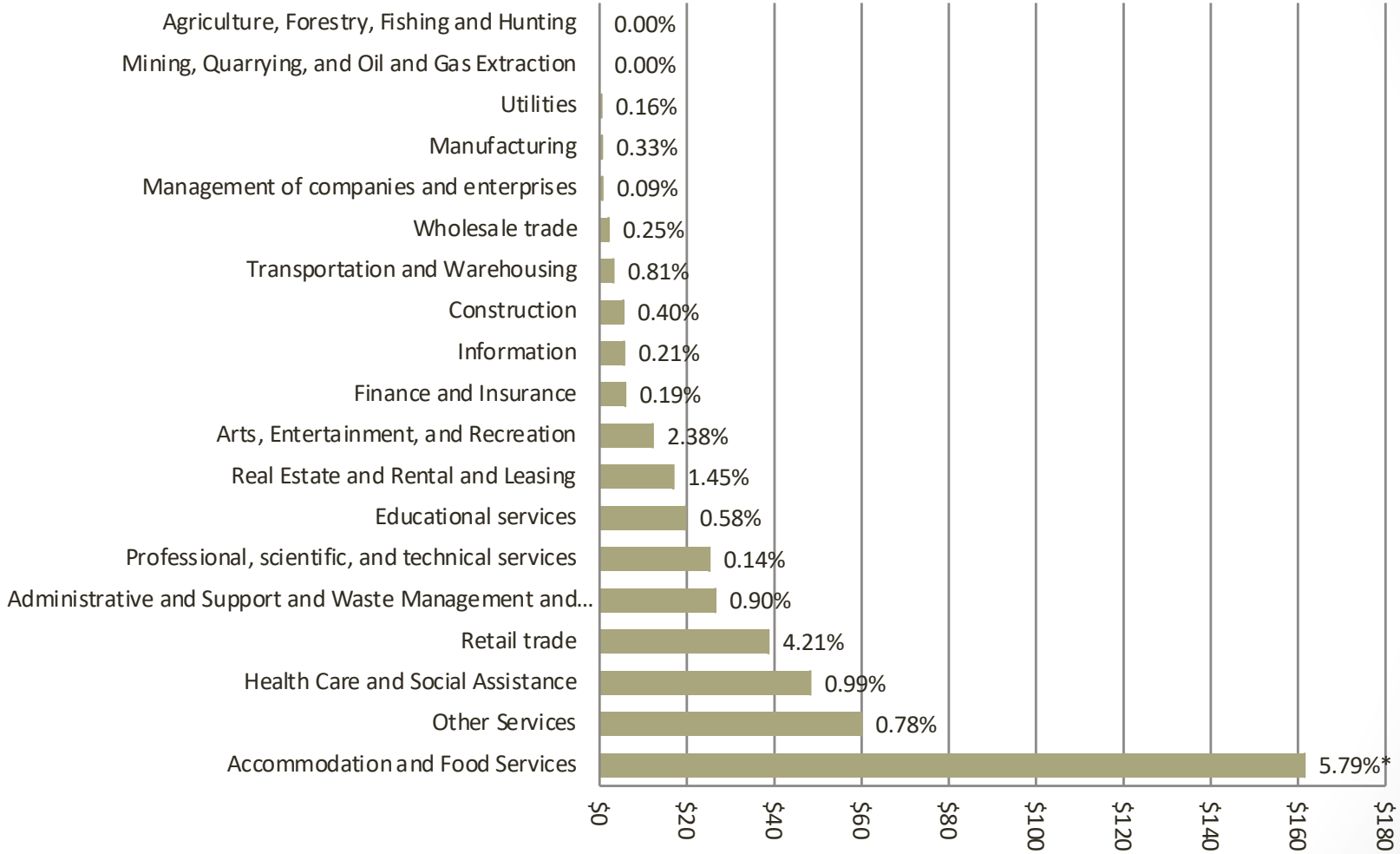
Note: Gross Impact assumes no economic reaction, such as changes in employment, wage and price levels, to policy changes.

Note: Impact on **DC Business Cost** in 2021 Will be $531mm, including $493 million in higher wage cost and 7.65%, or about $38mm of additional social security tax on higher wages and salaries.

Wage Increase for Minimum Wage Workers

Year	Max Wage Increase per Hour	AVG Wage Increase per Hour	AVG Wage Increase per Year	Max Wage Increase per Year
2020	$ 2.40	$ 1.99	$ 3,861.66	$ 4,677.07
2019	$ 1.69	$ 1.31	$ 2,542.70	$ 3,283.00
2018	$ 1.21	$ 0.89	$ 1,732.53	$ 2,362.75
2017	$ 0.74	$ 0.50	$ 963.37	$ 1,430.39

Size and Percentage of Minimum Wage Direct Impact, by Industry

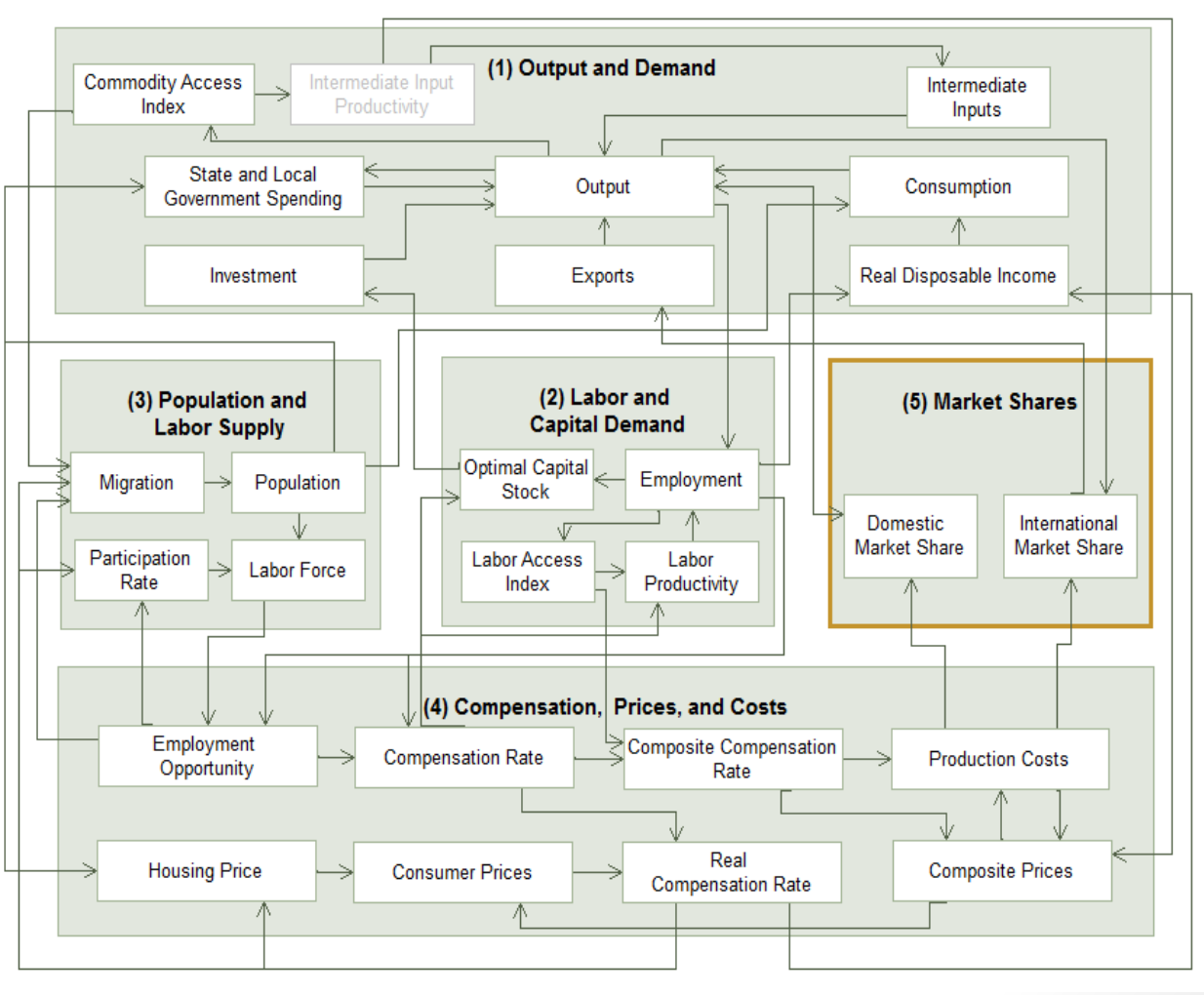


*The total wage cost increase for the food service sub-industry is 7.84%.

Source: 2014 BLS Occupational Employment and Wage Estimates for DC Converted to Industry Information Using National Industry Occupation Matrix

What is REMI?

- Incorporates four major modeling approaches: *Input-Output, Econometric, Economic Geography, and General Equilibrium.*
- At the core of the REMI model is the Input-Output matrix. DC's industry structure captured in the model as well as DC's inter-industry transactions.
- Unlike standard I/O models which only account for the direct output changes entered into the model, REMI incorporates the displacement and/or augmenting effects on similar businesses in a region.



Sample of REMI Equations

- 1) Output equations: DC REMI model is a 70 sector model, Output for 67 3-digits NAICS Code private Sectors and 3 government Sectors, are calculated from a regionalized input-output model. For industry i, (i =1,…,70) the output equation is

$$Q_i = \sum_{j=1}^{70} p_i a_{ij} Q_j + R_i(C_i + I_i + G_i) + X_i \quad (1)$$

- 2) Labor Demand: Once we have value added in sector i and intermediate input determined, the optimal labor and capital demand in sector i can be calculated from a constant returns to scale Cobb-Douglas function: $VA_i = A_i(L_i)^{\alpha_i}(K_i)^{\beta_i}(F_i)^{\gamma_i}$, where VA_i is value added for sector i, A_i is total factor productivity, L_i, K_i, and F_i are labor, capital and fuel respectively, and $\alpha+\beta+\gamma=1$. Demand for labor can be derived through cost minimization and be expressed as

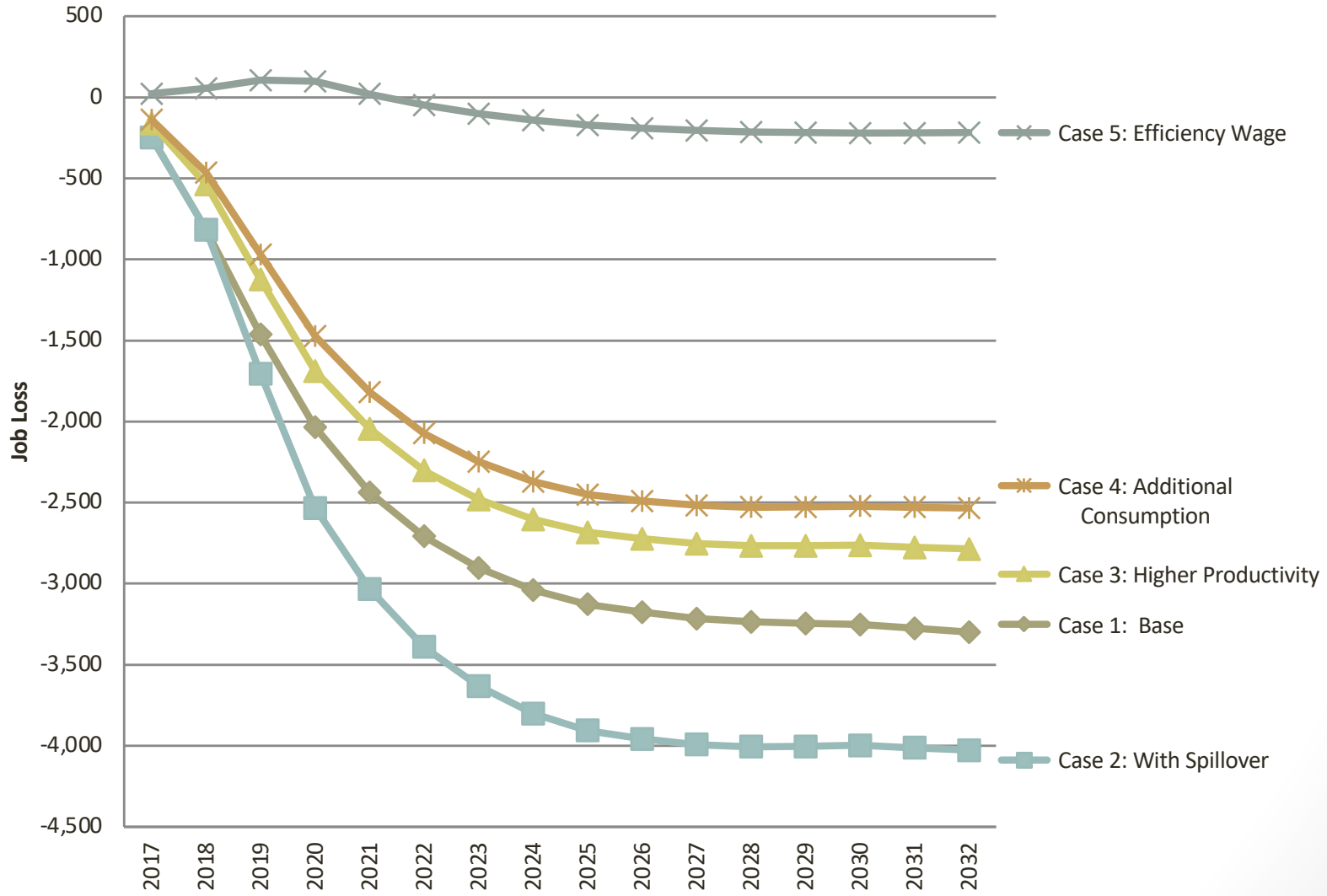
$$L_i = VA_i \left(\frac{1}{A_i}\right)\left(\frac{w_i}{\alpha_i}\right)^{\alpha_i - 1}\left(\frac{r_i}{\beta_i}\right)^{\beta_i - 1}\left(\frac{f_i}{\gamma_i}\right)^{\gamma_i - 1} \quad (2)$$

III. Results

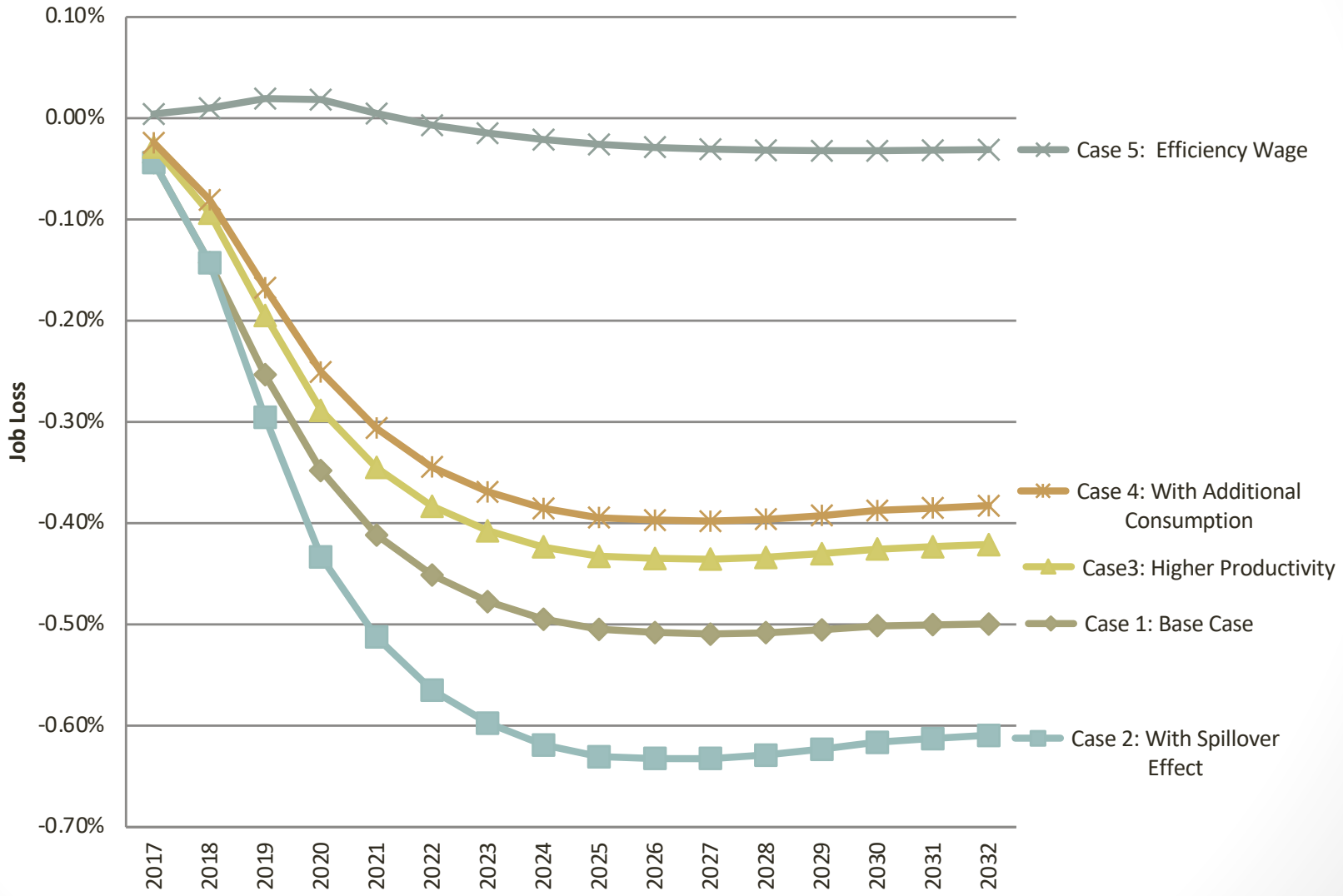
Scenarios and Assumptions

Scenarios	Descriptions	Assumptions
Case 1	Base	Only workers currently earning less than $15/hour will benefit
Case 2	Spillover	In addition to Case 1, workers earning slightly above minimum wage ($15-$18/hour) will also benefit
Case 3	Productivity	In addition to Case 2, higher minimum wage will increase workers' productivity and reduce turnover & recruiting costs. Total Saving = 30% of the increase in business cost
Case 4	Consumption	In addition to Case 3, minimum wage workers pay no federal and local income tax and will spend all their extra income on consumption
Case 5	Efficiency Wage	Same as in Case 4, but total savings from higher productivity, lower turnover &recruiting costs are greater. Total Savings = 75% of the increase in business cost.

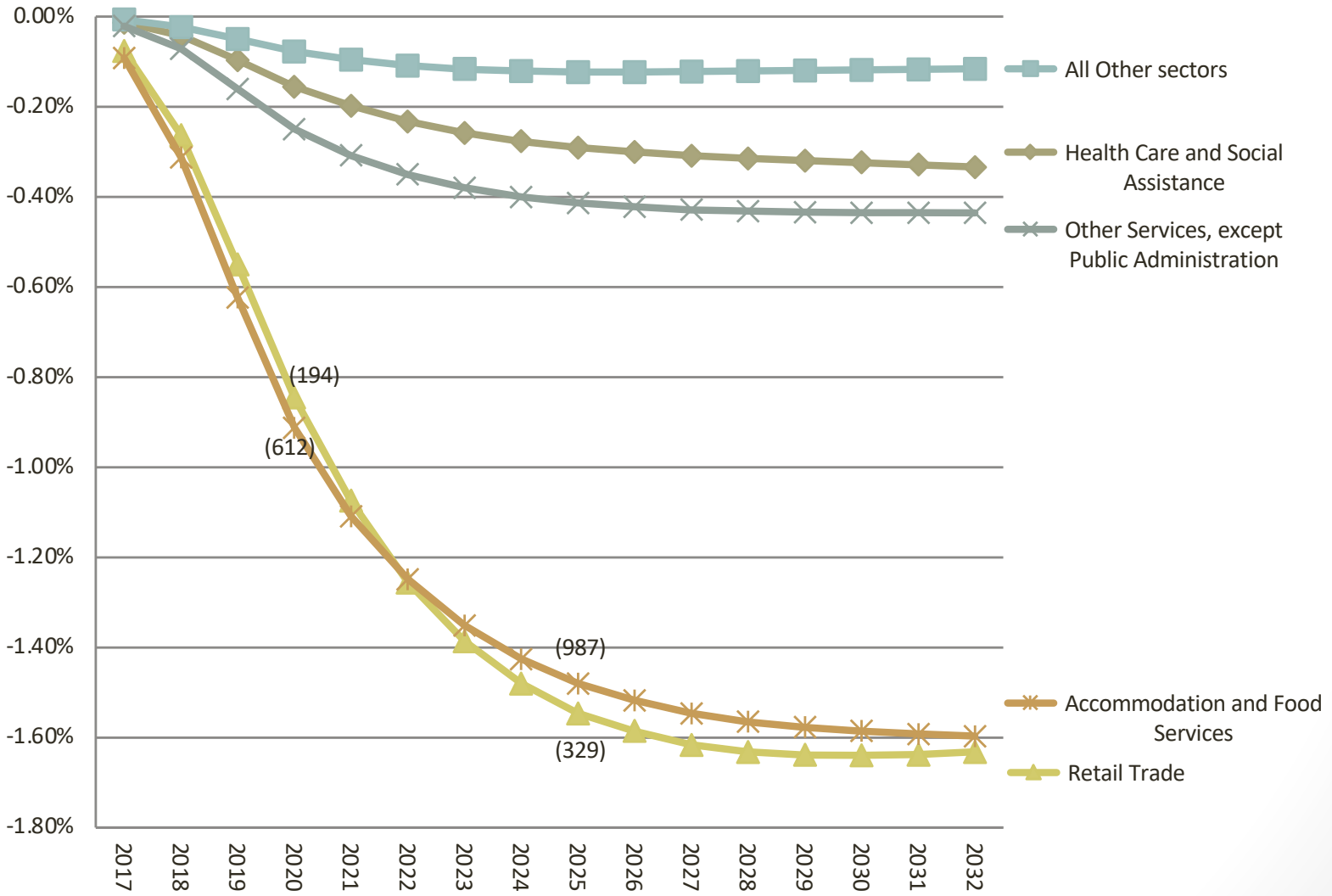
Job Loss Impact on All DC Workers



Job Loss Impact on All DC Workers (%)

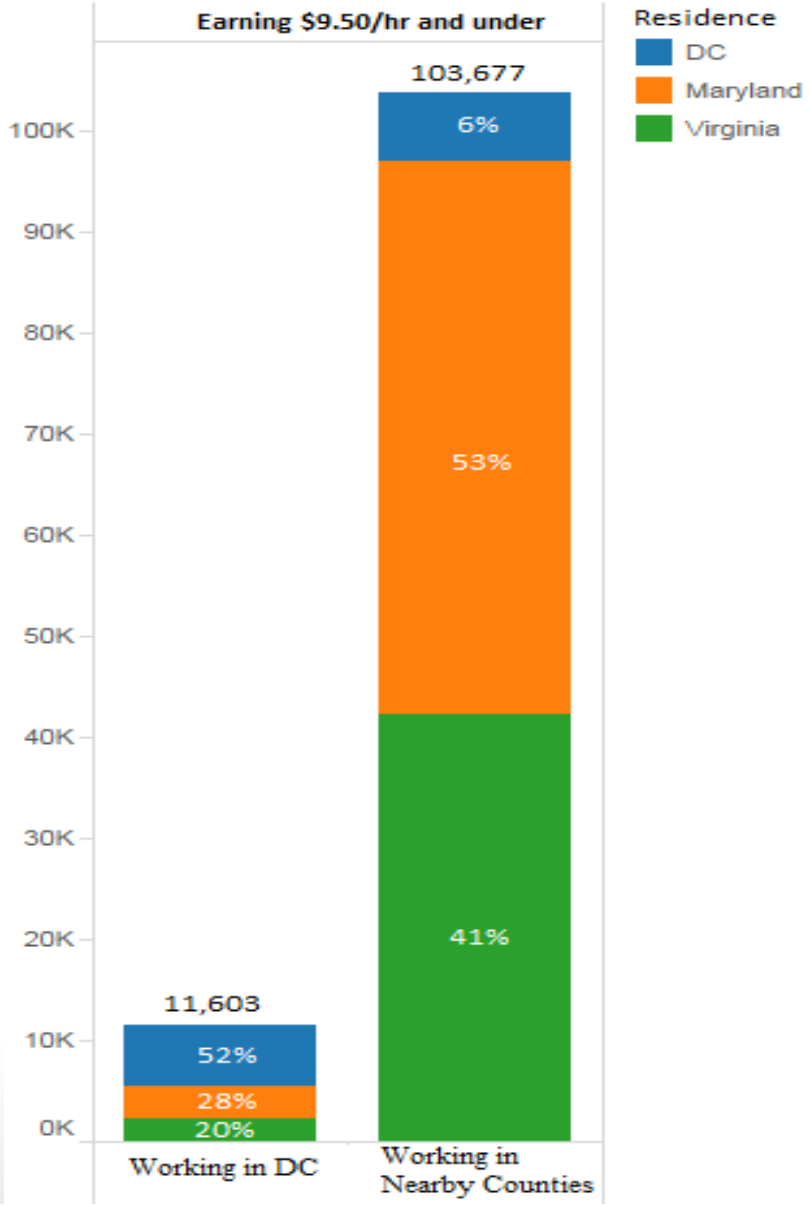


Private Employment Job Loss by Sector



Commuter Effects

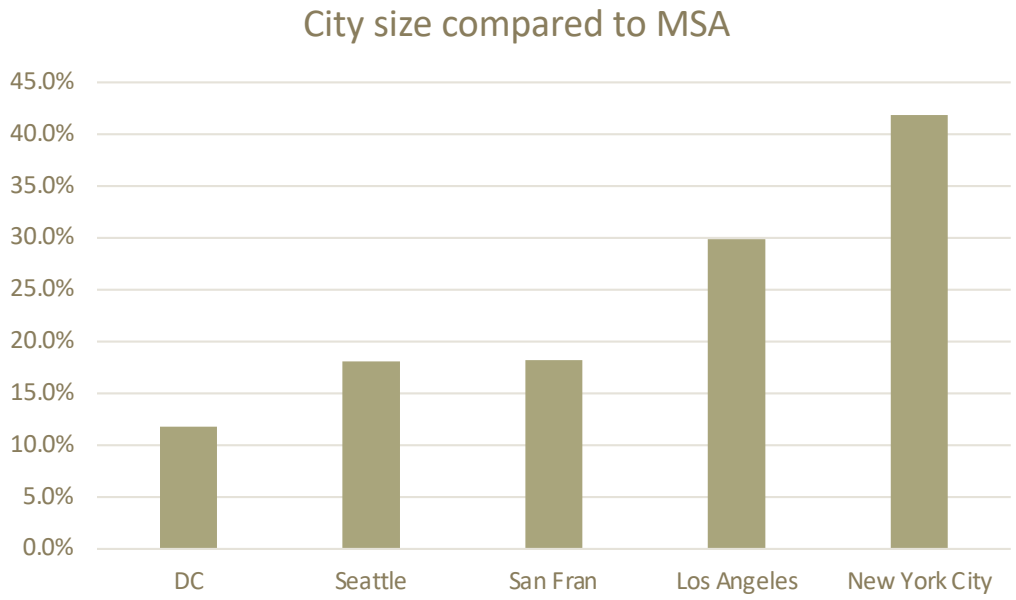
DC Metropolitan Area Minimum Wage Workers



At $9.50/hr minimum wage in 2014, there were 11,603 workers working in DC and 103,667 minimum wage workers working in nearby counties

At $15/hour minimum wage, we expect more people from nearby counties to compete for DC jobs

Commuter Effects (cont'd)



- DC as a share of its MSA is the smallest compared to other cities. This magnifies the commuter effect

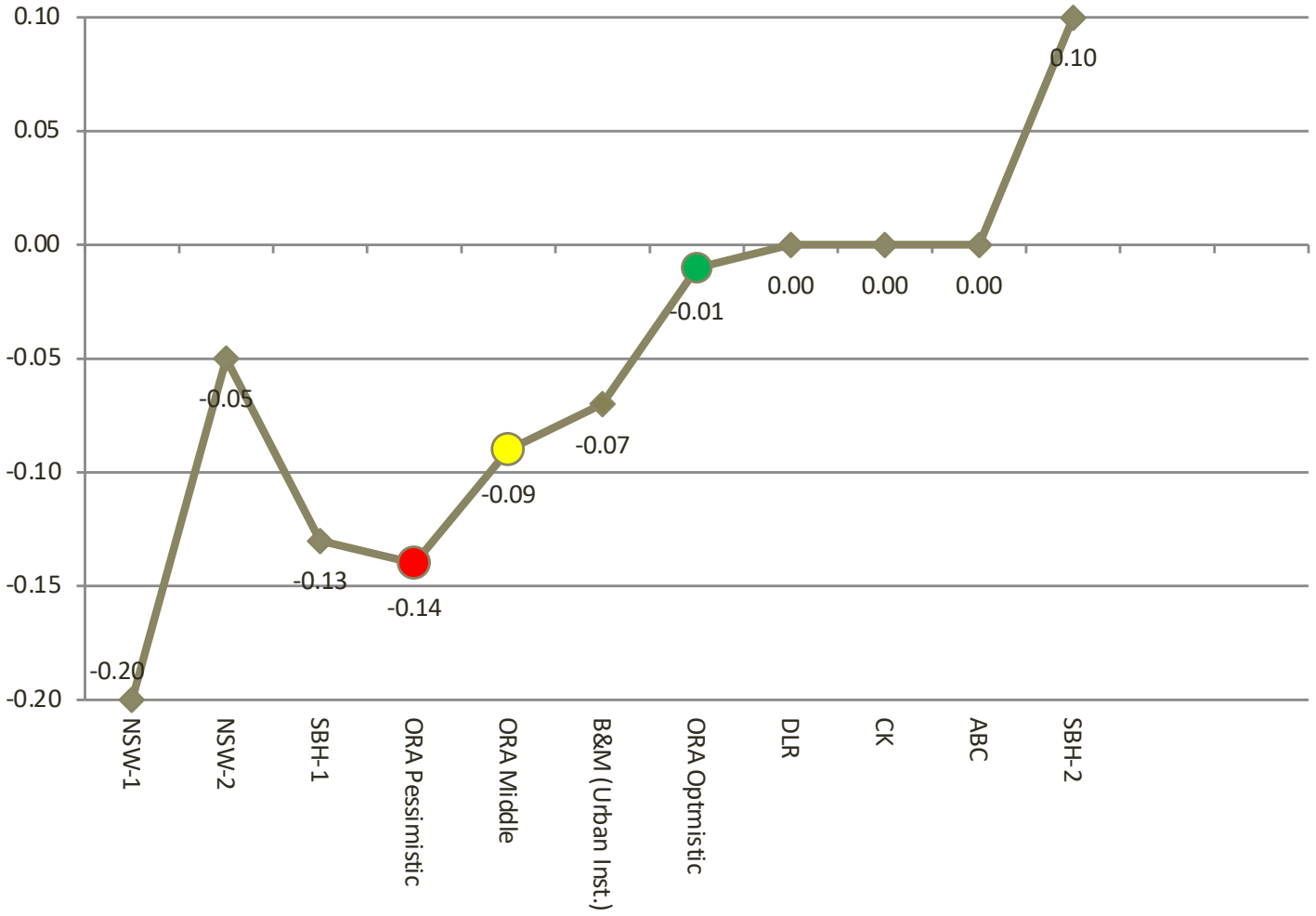
- DC will have the largest cumulative minimum wage increase from 2014-2020 compared to any other city (from $8.25 to $15)

Survey of Minimum Wage Employment Elasticities

	Studies	Effected population
NSW-1	Neumark, Salas & Wascher (2014)	Teens
NSW-2	Neumark, Salas & Wascher (2014)	Restaurant workers
SBH-1	Sabia, Burkhauser & Hansen (2012)	Workers with high school degree, no bachelors
SBH-2	Sabia, Burkhauser & Hansen (2012)	Workers with at least a bachelors
DLR	Dube, Lester & Reich (2010)	Restaurant workers & accommodation, food service, retail industries
CK	Card & Krueger (2000)	Fast food workers
ABC	Addison, Blackburn & Cotti (2014)	Restaurant and bar sector workers
B & M	Belman & Wolfson (2014)	Aggregate of 70+ studies showing effect of minimum wage on jobs
ORA**	DC Office of Revenue Analysis (2016)	DC Resident Workers with WS between $3,000-$32,000.

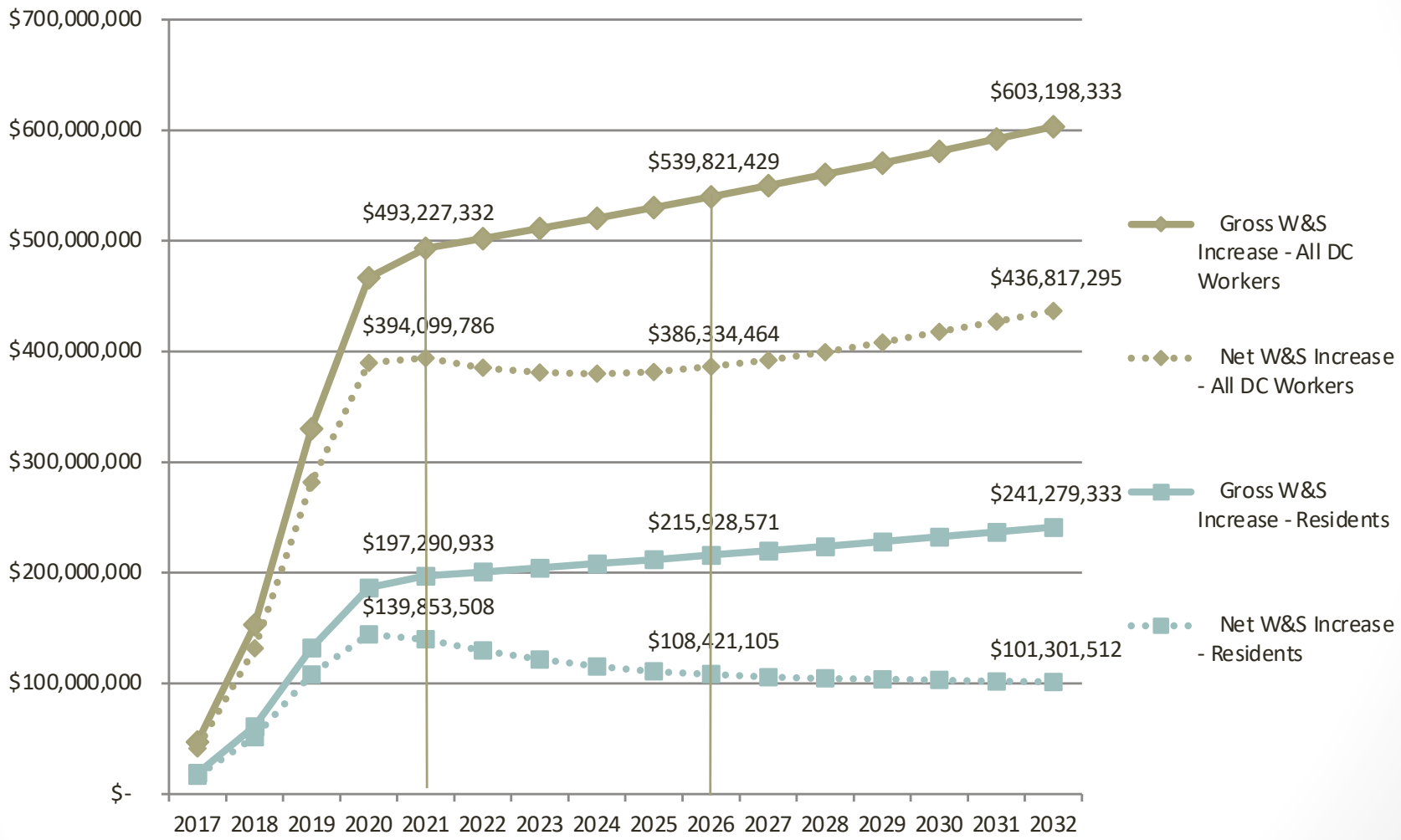
** ORA -Hi: Modeled approximation of NSW-1, NSW-2 and SBH-1
ORA - M: Most likely estimate
ORA - Lo: Modeled approximation of DLR, CK and ABC

Estimated Employment Elasticities

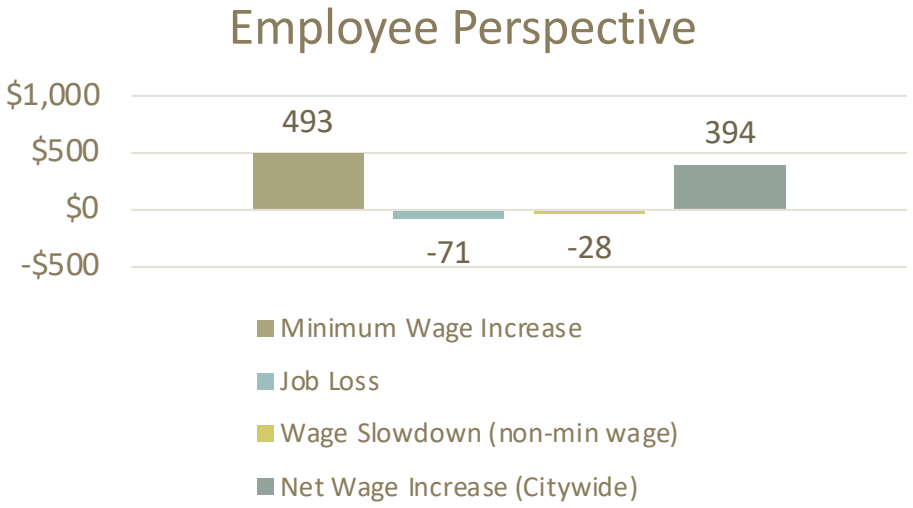


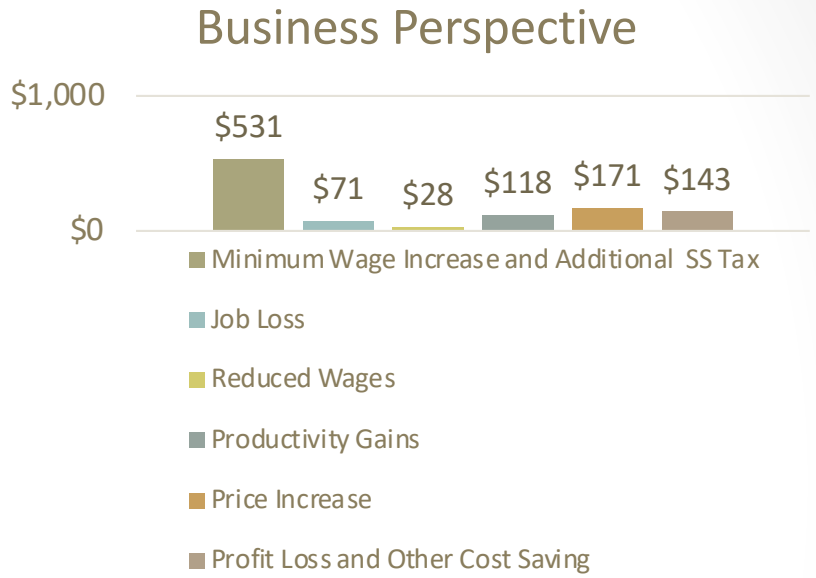
*For DC Residents; Private Employment

Changes in Wages and Salaries (W&S) for All DC Workers and Resident Workers, Middle Case



Net Wage & Salary Effects (2021)

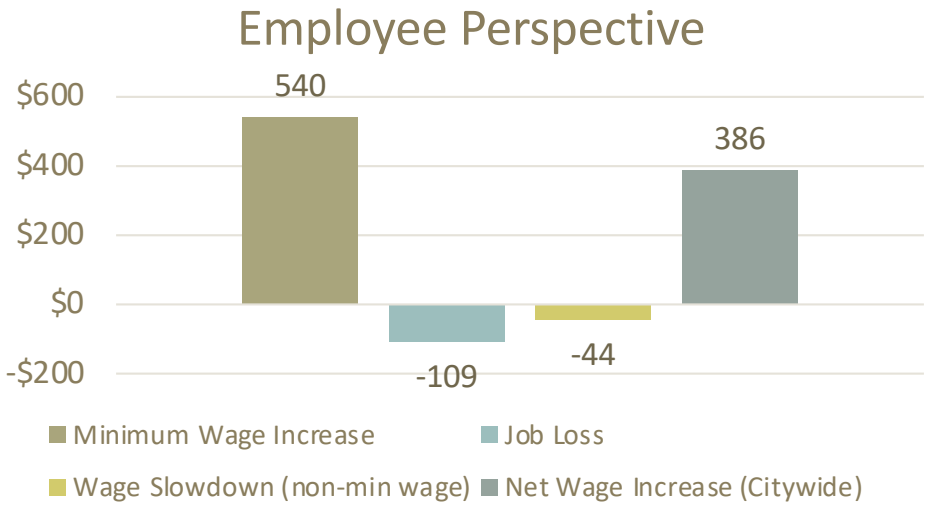


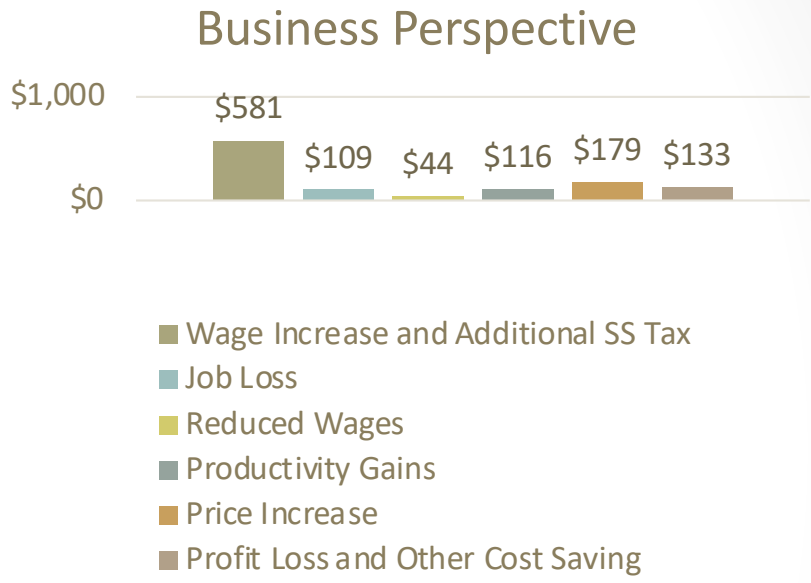


- Employees gain $493mm in aggregate wages
- However, due to job losses for 1,817 people and slower wage growth for the above $18/hour population, there are some offsetting effects
- The **Net Effect** on Wages is $394mm in 2021

- Businesses face $531mm in costs
- They 'pay for this' in several ways:
  - Layoffs ($71mm)
  - Lower wage growth for $18/hr+ employees ($28mm)
  - Productivity gains (118mm savings)
  - Price Increases ($171mm)
  - Misc. cost saving initiatives & decrease in profits ($143mm)

Net Wage & Salary Effects (2026)



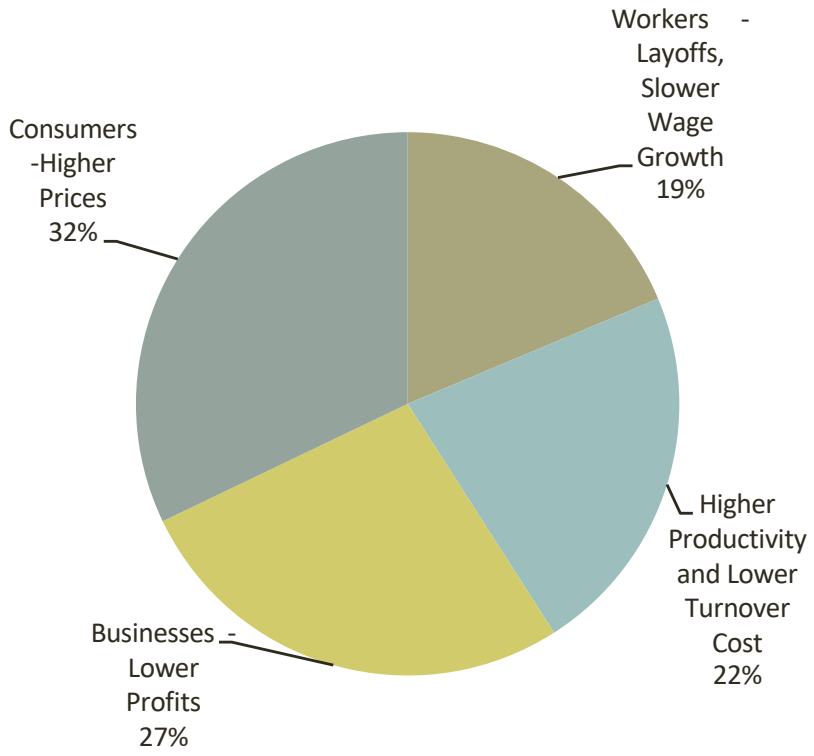


- The **Net Effect** on Wages is $386mm in 2026

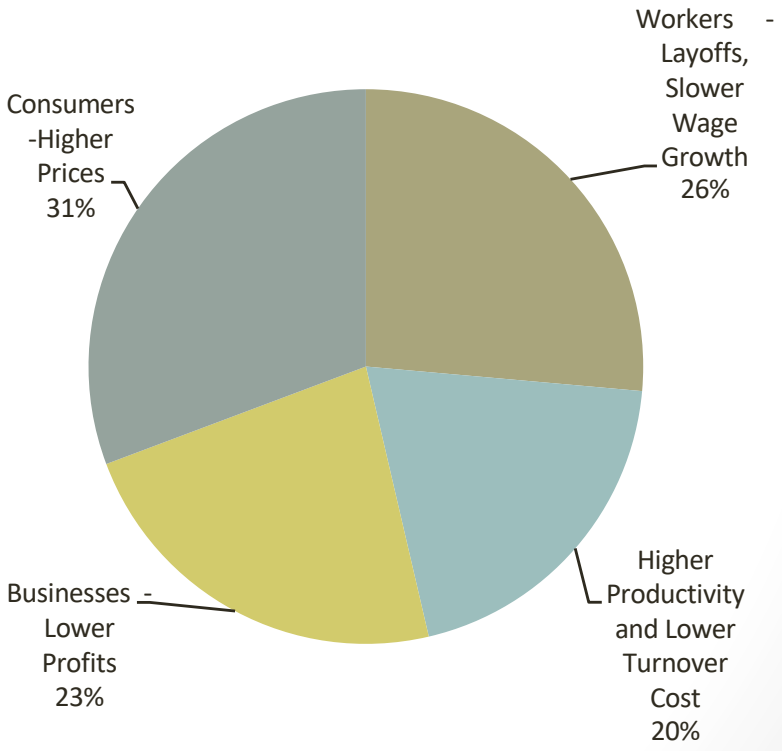
- Businesses face $581mm in costs

Sharing the Burden

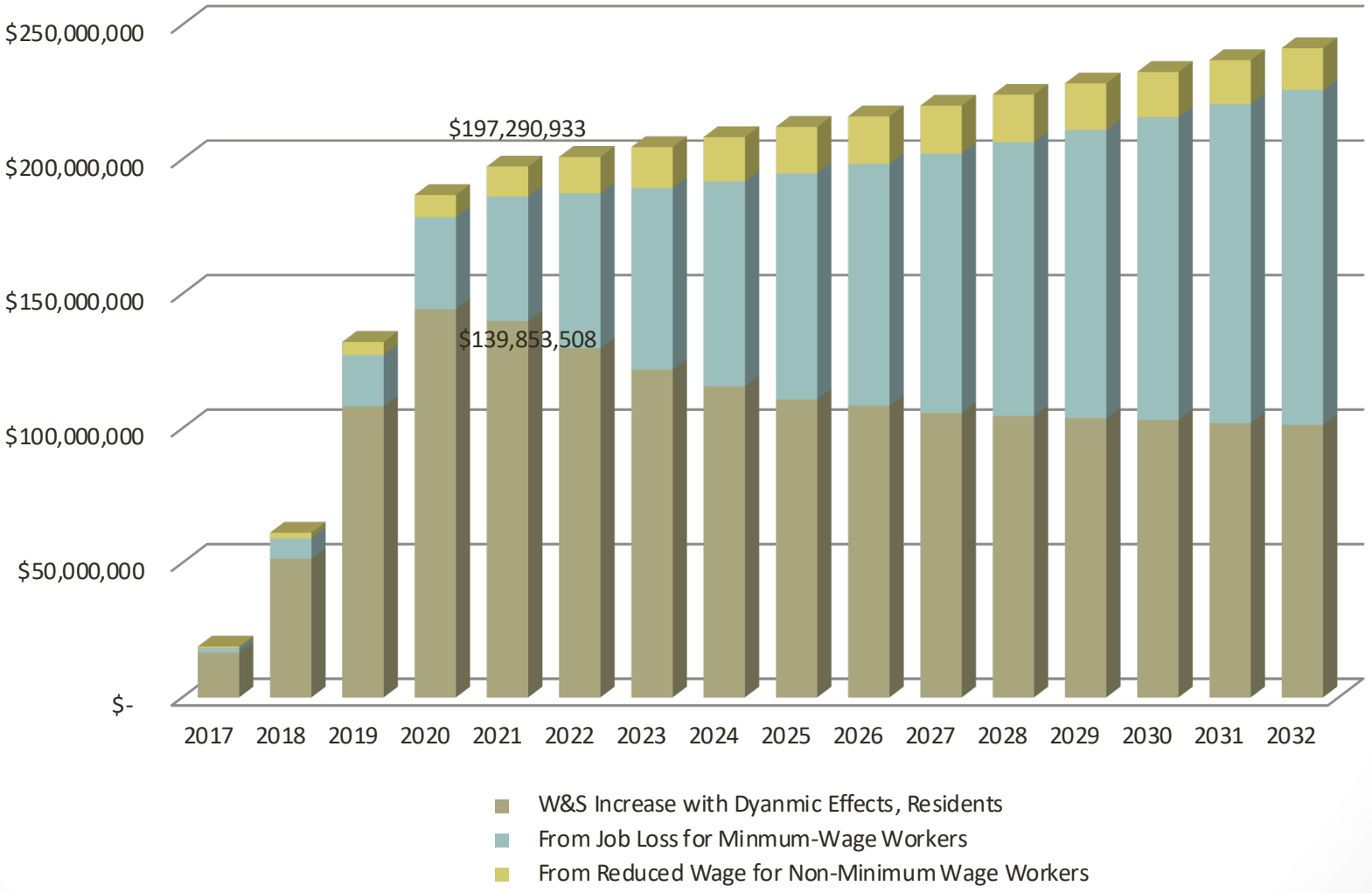
Who Pays the $531 million Higher Wage Cost in 2021?



Who Pays the $581 million Higher Wage Cost in 2026?

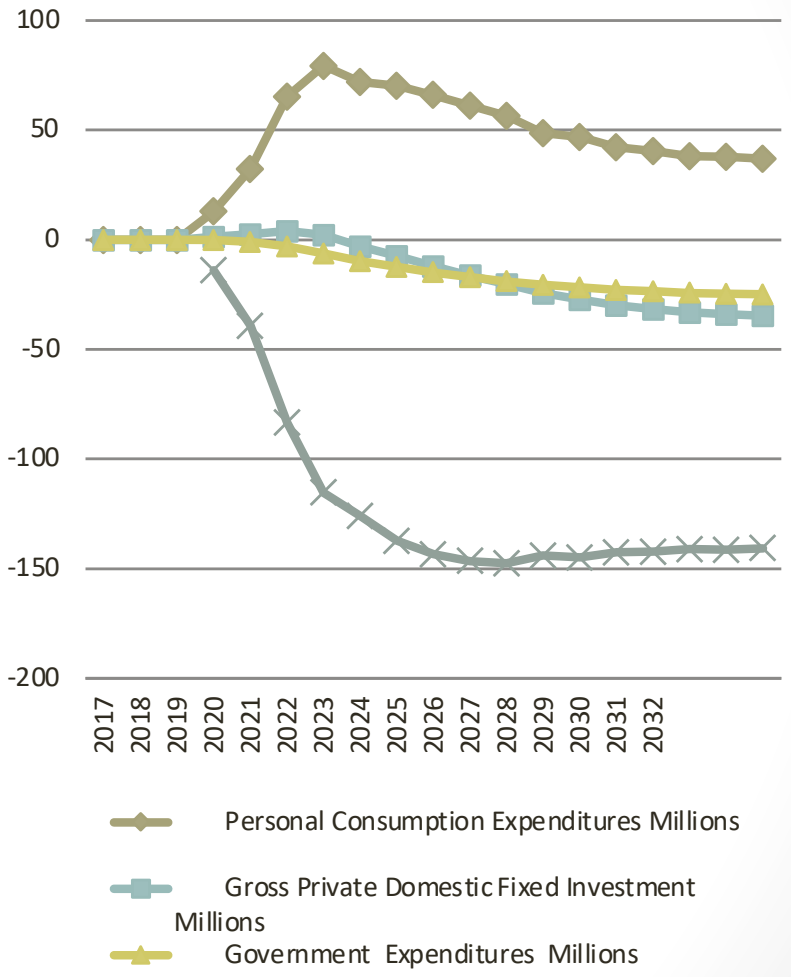


Differences Between Gross and Net W&S Impacts for DC Residents

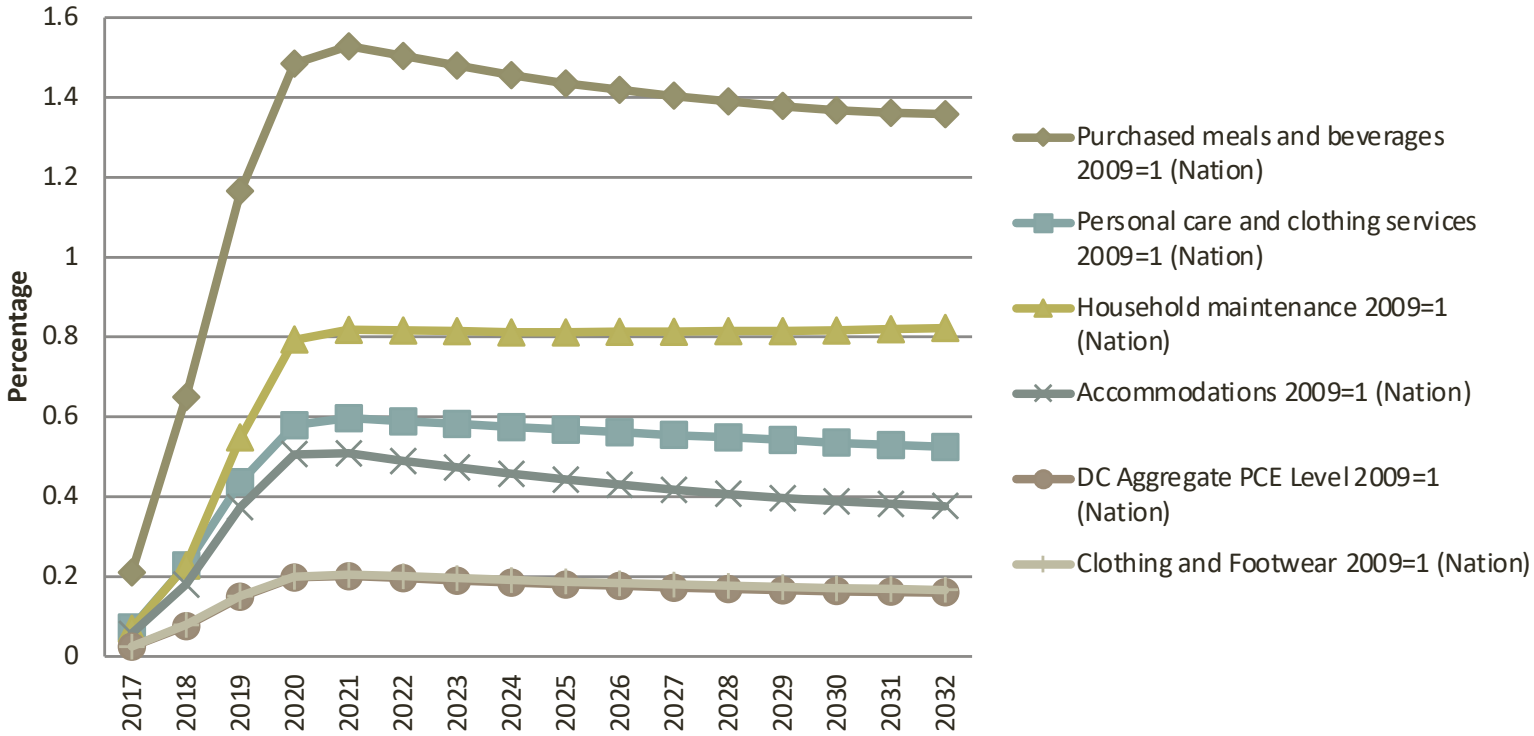


DC GDP and Its Components (millions, 2009 Dollars)

	2021	2026	2032
Consumption	$ 72 (0.19%)	$ 49 (0.12%)	$ 37 (0.09%)
Investment	$ -3 (-0.02%)	$ -24 (-0.17%)	$ -35 (-0.20%)
Government Expenditures	$ -10 (-0.01%)	$ -21 (-0.04%)	$ -25 (-0.05%)
Net Export	$ -126 (-0.70%)	$ -144 (-0.77%)	$ -141 (-0.67%)
Exports	$ -64 (-0.07%)	$ -113 (-0.11%)	$ -126 (-0.12%)
Imports	$ 62 (0.08%)	$ 31 (0.04%)	$ 14 (0.02%)
Net Changes in Real GDP	**$ -66 (-0.06%)**	**$ -140 (-0.11%)**	**$ -163 (-0.12%)**



Changes in Major Consumption Commodity Prices



	2021	2026	2032
PCE Price Index (2009=100)	127.67	140.85	158.44
PCE Price Increase Over Baseline	0.26 (0.20%)	0.25 (0.18%)	0.25 (0.16%)

What happened to Food Price in Restaurants in 2020?

40 cents

- For Every **$1** in Food Purchased in Restaurants
- **40 cents** are the average labor cost

3.5 cents

- Restaurants labor cost will increase by 7.84%
- Increase in labor costs per $1 of food: **3.1** cents

1.6 cents

- Restaurants will be able to increase menu price by **1.5 cents** in 2021
- $1 Food price = $1.015, or 1.5% increase over baseline price

46%

- 1.5 cents of the 3.1 cents of the increase in labor cost, or **48%** will be passed to consumers

Fiscal Impact

(millions)	2021	2026	2032
Real Consumption (2009 $)	$72 (0.19%)	$49 (0.12%)	$92 (0.22%)
Nominal Consumption	$163 (0.40%)	$144 (0.30%)	$186 (0.34%)
Nominal Wages and Salaries	$140 (0.26%)	$108 (0.17%)	$101 (0.13%)
Nominal Business Profit	-$143	-$133	-$152

(millions)	2021	2026
Sales Tax	$6.14	$5.33
Personal Income Tax	$5.87	$4.35
Corporate Franchise and UB Tax	-$10.02	-$9.33
Total Impact	$1.99	$0.36

Results

- Total Affected DC residents: **~61,000**
- Jobs for DC residents:
  - **1,181 jobs lost (-0.35%) by 2021**; 2,046 by 2026; 2,473 by 2032
- Total Real Consumption in DC:
  - **Increased by 0.19% in 2021**; 0.12% in 2026, and 0.09% in 2032
- Total DC Real GDP:
  - **Decreased by $66 mm in 2021**, by $140 mm in 2026, and by $163 mm in 2032
- Earnings for DC residents:
  - **Increased by $140 mm in 2021**; $108mm in 2026, and 101 mm in 2032
- Earnings for non-residents DC workers:
  - **Increased by $254 mm in 2021**; $278 mm in 2026, and $335 mm in 2032
- Consumer Prices
  - **Increased by .20% in 2021,** by .18% in 2026 and by .16% in 2032
- DC Fiscal and Economic effects: $1.99 million in 2021

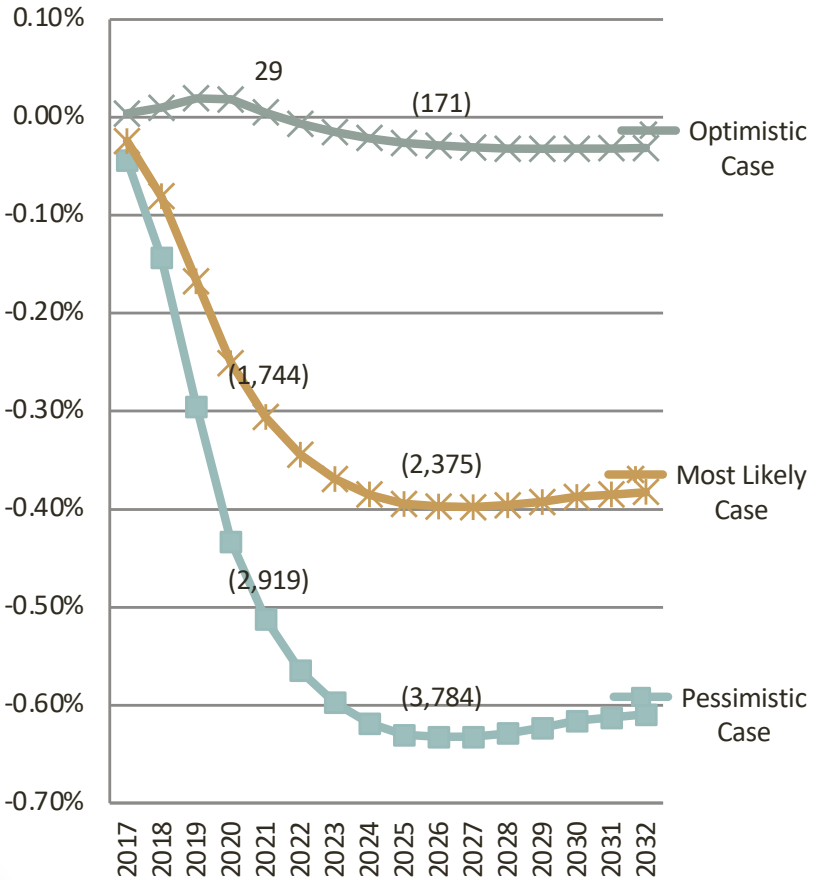
Conclusions

- **From DC's perspective:**
  - ~61,000 of the DC's poorest residents will see additional income by 2021
  - In 2021, the city's economy will lose ~$66 mm in economic activity due to increased imports and lowered exports mitigated by a higher consumption. 1,181 DC residents may lose their DC employment
    - DC Resident Employment will suffer roughly twice the job losses compared to ALL DC Workers
  - DC's Food and Retail industries will be the most affected

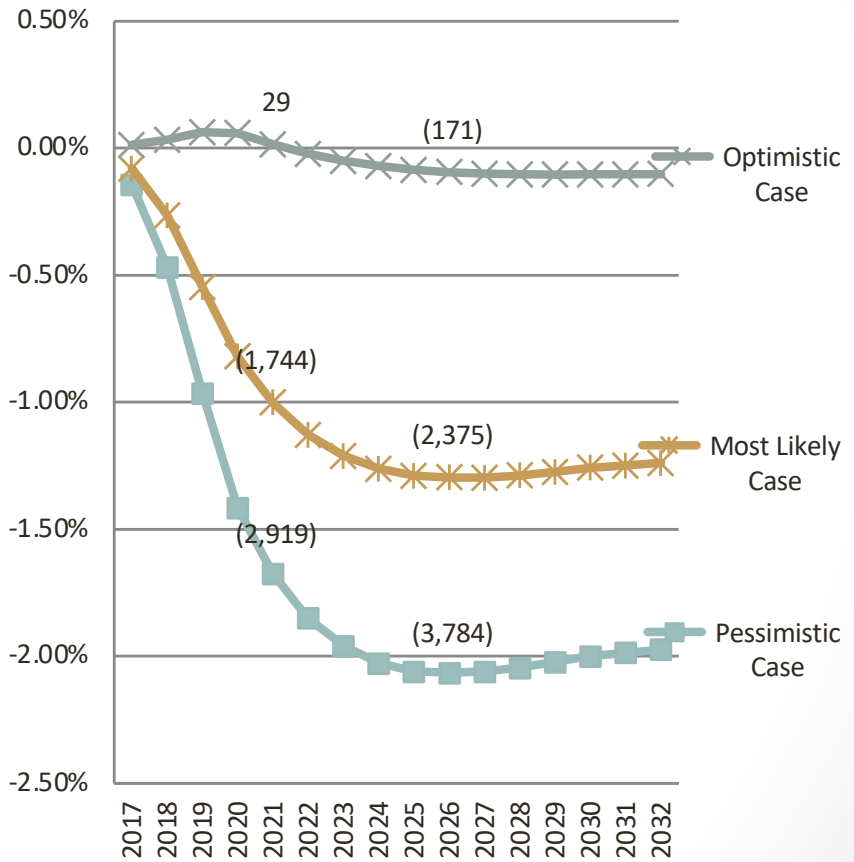
- **From the Region's perspective:**
  - Surrounding Counties will benefit more than DC from this policy since more than 55% of affected workers live in MD or VA.
  - Directly affected DC businesses may be significantly less competitive than their MD and VA counterparts

DC Private Employment Job Loss

Relative to All DC Private Workers (~618k)

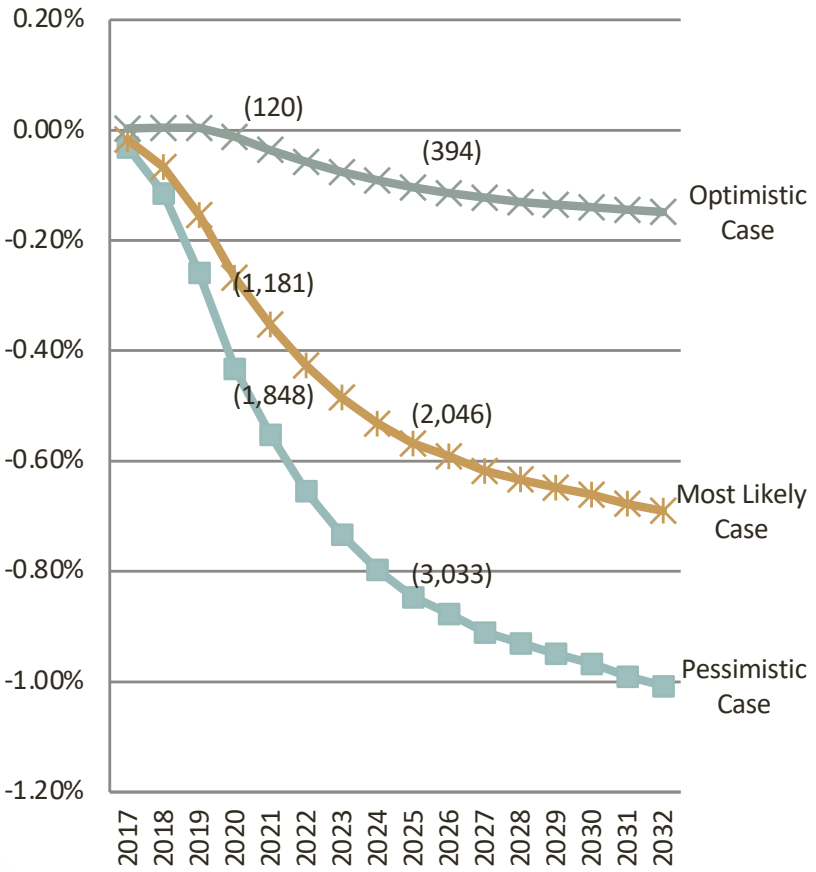


Relative to All DC Minimum Wage Workers (~167k)



Impact on DC Private Resident Employment

Relative to All Resident Private Workers (~345k)



Relative to Resident Minimum Wage Workers (~67k)