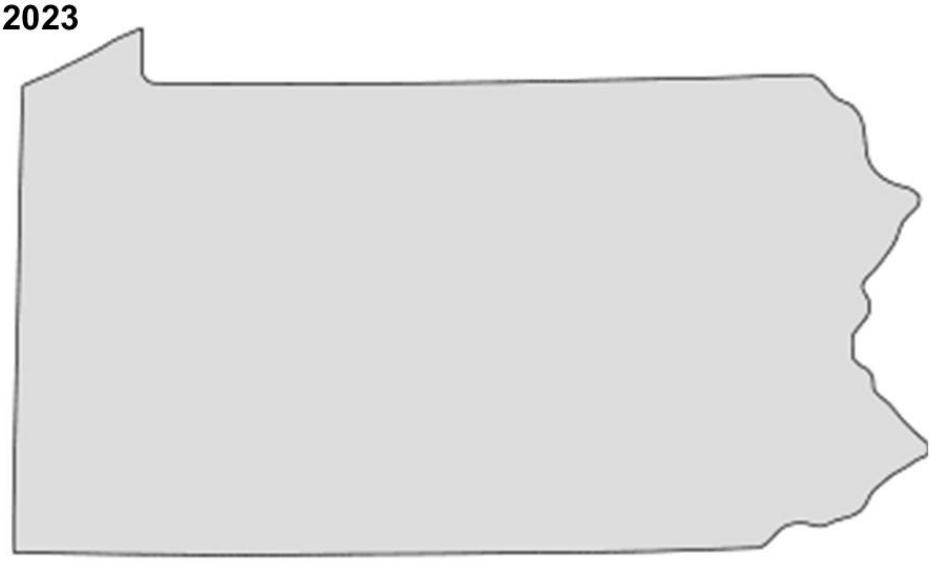
REMI

Regional Economic Models, Inc.

Economic Impacts of a Proposed Minimum Wage Increase in Pennsylvania

June 2023



Sponsor
National Federation of Independent Business

NFIB

Principal Investigator
Peter Evangelakis, Ph.D.

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REMI Background & Experience

Regional Economic Models, Inc. (REMI) is an independent company with offices in Amherst, MA and Washington, D.C. that provides non-partisan economic analysis and modeling software to its clients, who include federal, state, and local government agencies, non-profit organizations, universities, and private companies. With over 40 years of experience, REMI is a worldwide leader in providing dynamic regional U.S. macroeconomic and demographic models used to evaluate labor policy as well as many other policy issues such as economic development, taxes, health care, transportation, energy and the environment, and trade. REMI consultative services and modeling software have been used extensively in Pennsylvania. This is addition to several other analyses of proposed state and federal minimum wage increases performed by NFIB and other clients such as the District of Columbia Office of Revenue Analysis and New Hampshire Employment Security.

REMI Glossary

Economic Output: The amount of economic production, including all intermediate goods purchased. This can also be thought of as sales or supply.

Employment: The number of jobs, full-time plus part-time, by place of work for all industries.

Executive Summary

Regional Economic Models, Inc. (REMI) was retained by the National Federation of Independent Business (NFIB) to perform an economic impact analysis of the proposed Pennsylvania minimum wage increase detailed in House Bill 1500, which was referred to the Committee on Labor and Industry on June 12, 2023 for the 2023-2024 Pennsylvania legislative session. REMI analyzed the bill over the period 2024-2033 using the Pennsylvania region of NFIB's national REMI BSIM model. Additional information about the model is available in the Appendix.

The bill would raise the state minimum wage from the current rate of $7.25 per hour to $15.00 per hour by 2026. Minimum wage increases in subsequent years would be calculated to the nearest five-cent increment based on regional price inflation and published by approximately November 1 of the previous year by the Pennsylvania Secretary of Labor and Industry. REMI estimated these increases using a business-as-usual economic forecast in the BSIM model. Table 1 shows the proposed statutory and projected minimum wage schedule over the period 2024-2033.

Table 1: Proposed Minimum Wage Schedule (Statutory: 2024-2026; Projected: 2027-2033)

Wage Category	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Minimum Wage	$11.00	$13.00	$15.00	$15.30	$15.60	$15.90	$16.25	$16.60	$16.95	$17.30

In order to perform its analysis, REMI also estimated several key factors for each business sector, including: hourly worker employment, wage distribution (including workers earning exactly at minimum wage or tipped workers earning a cash wage[1]), and average annual hours worked. Additionally, the analysis allowed for the presence of "emulation effects" for non-tipped workers, in which employees earning at or just above the new minimum wage also receive increases in their hourly pay so as to maintain the relative compensation structure within firms.[2] The number of workers assumed to be affected by this phenomenon was scaled conservatively by the size of the increase in the minimum wage. Finally, REMI added 7.65% to the estimated aggregate increase in wages in order to account for employers' federal payroll tax obligation.

Increasing the minimum wage would have multiple countervailing effects on the Pennsylvania economy. It would raise wages for many employed workers, increasing consumer spending and thereby creating additional demand for many in-state businesses. However, it would also raise labor costs for many businesses, negatively impacting the state's economic competitiveness and increasing consumer prices. REMI's analysis found that the latter effect would outweigh the former, leading to relatively lower levels of employment and economic output, as illustrated in Tables 2 and 3 respectively.

[1] Tipped workers earning a cash wage were not included in the analysis because their pay is not directly impacted by the bill.
[2] See: Grossman, Jean Baldwin, "The Impact of the Minimum Wage on Other Wages," The Journal of Human Resources, Vol. 18, No. 3 (Summer 1983); and Gramlich, Edward M., "Impact of Minimum Wages on Other Wages, Employment, and Family Incomes," Brookings Papers on Economic Activity, The Brookings Institution, 1974, http://www.brookings.edu/~/media/projects/bpea/1976%202/1976b_bpea_gramlich_flanagan_wachter.pdf.

Table 2: Employment Impacts

Firm Size	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Percent of Total (2033)
1-4 Employees	-487	-1,238	-2,367	-3,083	-3,797	-4,411	-4,982	-5,465	-5,863	-6,182	6.1%
5-9 Employees	-624	-1,568	-2,973	-3,806	-4,625	-5,319	-5,967	-6,509	-6,953	-7,305	7.2%
10-19 Employees	-741	-1,891	-3,623	-4,703	-5,779	-6,697	-7,553	-8,271	-8,864	-9,341	9.2%
20-99 Employees	-1,428	-3,765	-7,372	-9,812	-12,241	-14,303	-16,205	-17,794	-19,109	-20,173	19.9%
100-499 Employees	-763	-2,187	-4,494	-6,375	-8,215	-9,750	-11,134	-12,275	-13,214	-13,977	13.8%
500 + Employees	-2,252	-6,977	-14,680	-21,412	-27,441	-32,192	-36,310	-39,649	-42,377	-44,592	43.9%
< 20 Employees	-1,853	-4,697	-8,963	-11,592	-14,201	-16,427	-18,502	-20,245	-21,680	-22,829	22.5%
< 100 Employess	-3,280	-8,462	-16,335	-21,404	-26,443	-30,730	-34,707	-38,039	-40,788	-43,002	42.3%
< 500 Employees	**-4,043**	**-10,648**	**-20,829**	**-27,779**	**-34,657**	**-40,480**	**-45,840**	**-50,314**	**-54,003**	**-56,979**	**56.1%**
All Firms	**-6,295**	**-17,626**	**-35,509**	**-49,191**	**-62,099**	**-72,672**	**-82,151**	**-89,963**	**-96,380**	**-101,570**	**100.0%**

**Units: Jobs. Impacts reported for private non-farm industries only. Totals and percentages may not correspond to impacts due to rounding.*

Table 3: Economic Output Impacts

Firm Size	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Percent of Total (2033)
1-4 Employees	-20.6	-67.8	-154.5	-247.5	-351.8	-443.6	-527.6	-597.0	-653.2	-698.1	5.1%
5-9 Employees	-28.6	-87.4	-191.5	-292.8	-404.2	-501.4	-590.2	-663.0	-721.6	-768.1	5.7%
10-19 Employees	-36.0	-112.3	-248.0	-383.1	-531.3	-660.5	-777.9	-874.3	-951.9	-1,013.7	7.5%
20-99 Employees	-82.4	-267.2	-598.3	-930.8	-1,284.2	-1,587.4	-1,859.6	-2,081.4	-2,260.0	-2,402.4	17.7%
100-499 Employees	-54.5	-203.8	-480.3	-789.8	-1,104.0	-1,367.0	-1,598.7	-1,786.7	-1,938.1	-2,060.2	15.2%
500 + Employees	-182.3	-727.0	-1,706.1	-2,807.7	-3,820.1	-4,617.5	-5,295.9	-5,838.4	-6,274.1	-6,628.3	48.8%
< 20 Employees	-85.2	-267.5	-594.0	-923.4	-1,287.3	-1,605.5	-1,895.7	-2,134.3	-2,326.7	-2,479.9	18.3%
< 100 Employess	-167.6	-534.7	-1,192.3	-1,854.2	-2,571.5	-3,192.9	-3,755.3	-4,215.7	-4,586.7	-4,882.3	36.0%
< 500 Employees	**-222.1**	**-738.5**	**-1,672.6**	**-2,644.0**	**-3,675.5**	**-4,559.9**	**-5,354.0**	**-6,002.4**	**-6,524.8**	**-6,942.5**	**51.2%**
All Firms	**-404.4**	**-1,465.5**	**-3,378.7**	**-5,451.7**	**-7,495.6**	**-9,177.4**	**-10,649.9**	**-11,840.8**	**-12,798.9**	**-13,570.8**	**100.0%**

**Units: Millions of Fixed Local 2024 Dollars. Impacts reported for private non-farm industries only. Totals and percentages may not correspond to impacts due to rounding.*

As the size of the proposed minimum wage increase grows over the 2024-2033 period, the estimated impacts grow in magnitude.

By 2033, there is a negative employment impact of over 101,000 jobs, or 1% of the state's employment base. Furthermore, almost 57,000, or 56%, of those jobs are in small businesses, which are considered to be firms with less than 500 employees.

Also, by 2033, there is a negative economic output impact of over $13 billion, or 0.7% of the state's economic base. Furthermore, almost $7 billion, or 51%, of that economic output is produced by small businesses.

Appendix: REMI Model Framework

REMI BSIM (Business Size Impact Module) is a structural economic and demographic forecasting and policy analysis model that allows inputs and provides results by business size. The following core framework applies to all REMI model builds. The model integrates input-output, computable general equilibrium, econometric and economic geography methodologies. The model is dynamic, with forecasts and simulations generated on an annual basis and behavioral responses to compensation, price, and other economic factors.

The model consists of thousands of simultaneous equations with a structure that is relatively straightforward. The exact number of equations used varies depending on the extent of industry, demographic, demand, and other detail in the specific model being used. The overall structure of the model can be summarized in five major blocks: (1) Output and Demand, (2) Labor and Capital Demand, (3) Population and Labor Supply, (4) Compensation, Prices, and Costs, and (5) Market Shares. The blocks and their key interactions are shown in Figures 1 and 2.

Figure A1.1: REMI Model Linkages

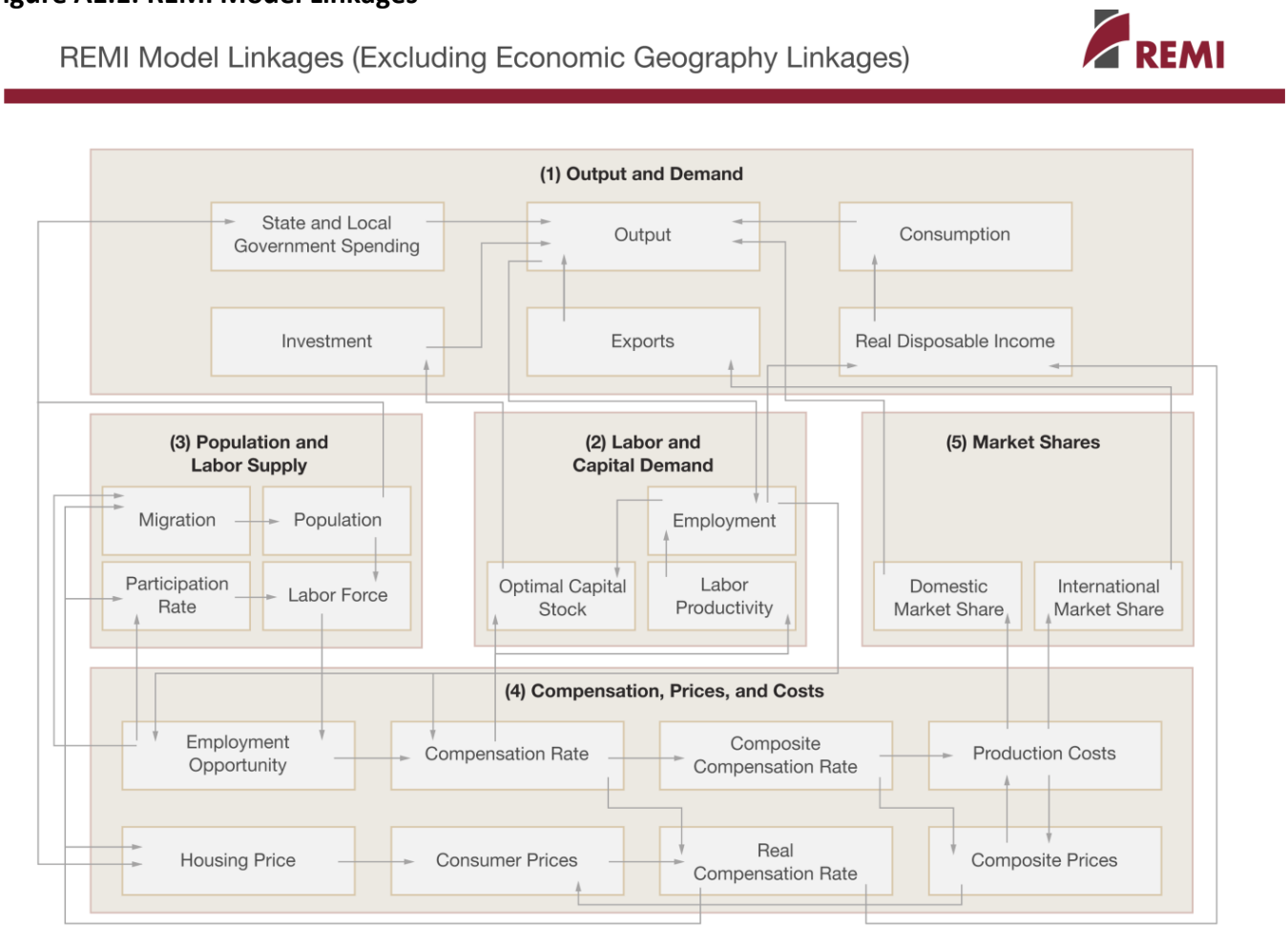
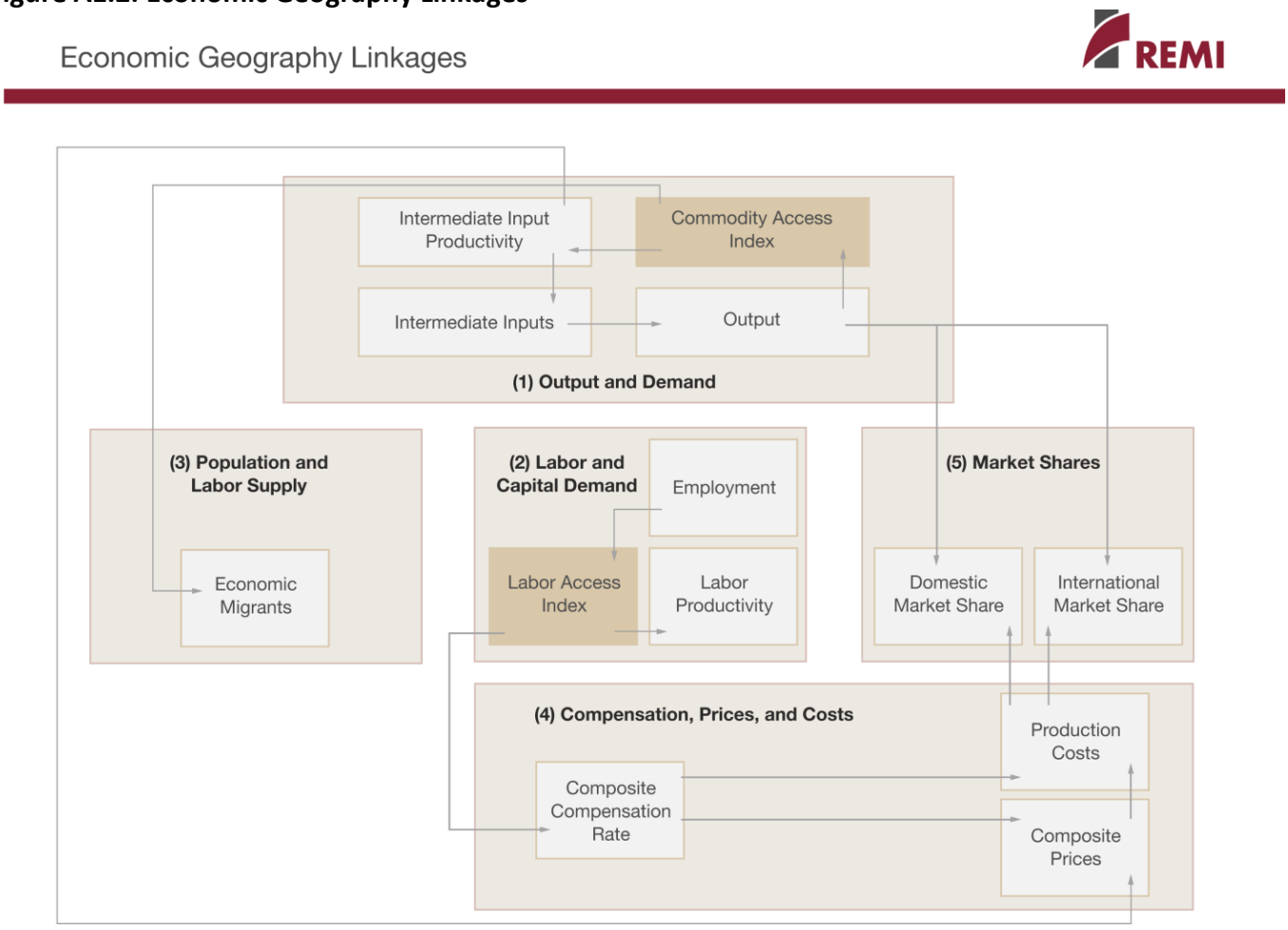


Figure A1.2: Economic Geography Linkages

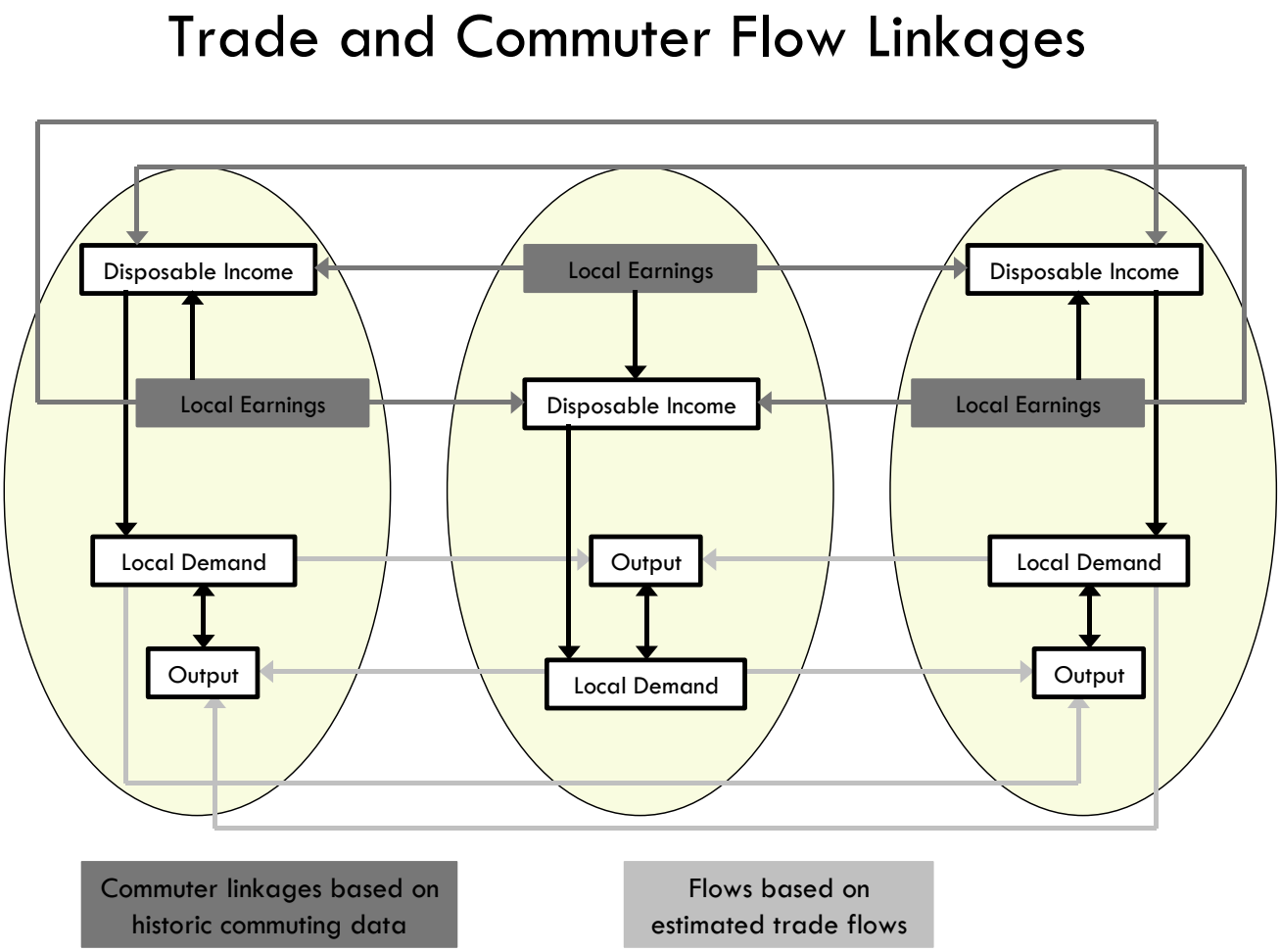


The Output and Demand block consists of output, demand, consumption, investment, government spending, exports, and imports, as well as feedback from output change due to the change in the productivity of intermediate inputs. The Labor and Capital Demand block includes labor intensity and productivity as well as demand for labor and capital. Labor force participation rate and migration equations are in the Population and Labor Supply block. The Compensation, Prices, and Costs block includes composite prices, determinants of production costs, the consumption price deflator, housing prices, and the compensation equations. The proportion of local, inter-regional, and export markets captured by each region is included in the Market Shares block.

Models can be built as single region, multi-region, or multi-region national models. A region is defined broadly as a sub-national area, and could consist of a state, province, county, or city, or any combination of sub-national areas.

Single-region models consist of an individual region, called the home region. The rest of the nation is also represented in the model. However, since the home region is only a small part of the total nation, the changes in the region do not have an endogenous effect on the variables in the rest of the nation. Multi-regional models have interactions among regions, such as trade and commuting flows. These interactions include trade flows from each region to each of the other regions. These flows are illustrated for a three-region model in Figure 3.

Figure A1.3: Trade and Commuter Flow Linkages



Multiregional national models also include a central bank monetary response that constrains labor markets. Models that only encompass a relatively small portion of a nation are not endogenously constrained by changes in exchange rates or monetary responses.

Block 1. Output and Demand

This block includes output, demand, consumption, investment, government spending, import, commodity access, and export concepts. Output for each industry in the home region is determined by industry demand in all regions in the nation, the home region's share of each market, and international exports from the region.

For each industry, demand is determined by the amount of output, consumption, investment, and capital demand on that industry. Consumption depends on real disposable income per capita, relative prices, differential income elasticities, and population. Input productivity depends on access to inputs because a larger choice set of inputs means it is more likely that the input with the specific characteristics required for the job will be found. In the capital stock adjustment process, investment occurs to fill the difference between optimal and actual capital stock for residential, non-residential, and equipment investment. Government spending changes are determined by changes in the population.

Block 2. Labor and Capital Demand

The Labor and Capital Demand block includes the determination of labor productivity, labor intensity, and the optimal capital stocks. Industry-specific labor productivity depends on the availability of workers with differentiated skills for the occupations used in each industry. The occupational labor supply and commuting costs determine firms' access to a specialized labor force.

Labor intensity is determined by the cost of labor relative to the other factor inputs, capital and fuel. Demand for capital is driven by the optimal capital stock equation for both non-residential capital and equipment. Optimal capital stock for each industry depends on the relative cost of labor and capital, and the employment weighted by capital use for each industry. Employment in private industries is determined by the value added and employment per unit of value added in each industry.

Block 3. Population and Labor Supply

The Population and Labor Supply block includes detailed demographic information about the region. Population data is given for age, gender, and race, with birth and survival rates for each group. The size and labor force participation rate of each group determines the labor supply. These participation rates respond to changes in employment relative to the potential labor force and to changes in the real after-tax compensation rate. Migration includes retirement, military, international, and economic migration. Economic migration is determined by the relative real after-tax compensation rate, relative employment opportunity, and consumer access to variety.

Block 4. Compensation, Prices and Costs

This block includes delivered prices, production costs, equipment cost, the consumption deflator, consumer prices, the price of housing, and the compensation equation. Economic geography concepts account for the productivity and price effects of access to specialized labor, goods, and services.

These prices measure the price of the industry output, taking into account the access to production locations. This access is important due to the specialization of production that takes place within each industry, and because transportation and transaction costs of distance are significant. Composite prices for each industry are then calculated based on the production costs of supplying regions, the effective distance to these regions, and the index of access to the variety of outputs in the industry relative to the access by other uses of the product.

The cost of production for each industry is determined by the cost of labor, capital, fuel, and intermediate inputs. Labor costs reflect a productivity adjustment to account for access to specialized labor, as well as underlying compensation rates. Capital costs include costs of non-residential structures and equipment, while fuel costs incorporate electricity, natural gas, and residual fuels.

The consumption deflator converts industry prices to prices for consumption commodities. For potential migrants, the consumer price is additionally calculated to include housing prices. Housing prices change from their initial level depending on changes in income and population density.

Compensation changes are due to changes in labor demand and supply conditions and changes in the national compensation rate. Changes in employment opportunities relative to the labor force and occupational demand change determine compensation rates by industry.

Block 5. Market Shares

The market shares equations measure the proportion of local and export markets that are captured by each industry. These depend on relative production costs, the estimated price elasticity of demand, and the effective distance between the home region and each of the other regions. The change in share of a specific area in any region depends on changes in its delivered price and the quantity it produces compared with the same factors for competitors in that market. The share of local and external markets then drives the exports from and imports to the home economy.