

National Minimum Wage in South Africa: Quantification of Impact

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Objective

To use economic modelling techniques to quantify the potential impact of introducing a National Minimum Wage (NMW) in South Africa.

Outline

- I. The ADRS Dynamically Integrated Macro-Micro Simulation Model of South Africa (DIMMSIM)
 - I. Scenarios for NMW
 - II. Data sources and preparation
- IV-IX. Model simulation results: Macroeconomic, industry, poverty and inequality impact
- X. Conclusions

I. THE ADRS DYNAMICALLY INTEGRATED MACRO-MICRO SIMULATION MODEL OF SOUTH AFRICA (DIMMSIM)

Overview of DIMMSIM

- ❖ DIMMSIM is a linked macro-micro model that captures the interactions between the macroeconomy and household poverty and income inequality in South Africa.
- ❖ Its macro model component is based on the ADRS Macroeconometric Model of South Africa (MEMSA).
- ❖ Its micro model component is based on the ADRS South African Tax and Transfer Simulation Model (SATTSIM).

Distinctive features of MEMSA

- ❖ It is designed to capture the structure, complexity and dynamics of the South African economy.
- ❖ The key to understand DIMMSIM's projections of the impact of the NMW policy is to understand how it captures production, expenditure, and distribution sides of the economy and their dynamic interactions based on time series analysis of bottom up representation of each side.

Production, Expenditure and Distribution

- ❖ GDP From Production Side: MEMSA represents the South African economy from its production side, where the size of the economy chiefly reflects the contributions of its 4 primary, 28 manufacturing, and 9 service sectors.
 - ❖ Time series analysis of determinants of short and long term dynamics of
 - ❖ 41 Sector output
 - ❖ 45 Sector prices

Production, Expenditure and Distribution

- ❖ GDP From Expenditure Side: It also represents the economy from the expenditure perspective: that is, the total output of the economy reflects the sum of total demand for domestically produced goods and services. This includes households and government final consumption expenditures, private sector and government investment expenditures, net exports of goods and services and changes in the inventory.
 - ❖ Time series analysis of determinants of short and long term dynamics of
 - ❖ 22 categories of household consumption expenditures
 - ❖ 41 sector investment
 - ❖ 41 sector export
 - ❖ 38 sector imports

Production, Expenditure and Distribution

- ❖ GDP From Distribution Side: Finally, the model captures the economic pie in terms of its distribution between the main actors in the economy in the form of wages and salaries (remuneration), profits (gross operating surplus), and government net revenue. The relative share of the main actors in the economy reflects each group's claim on the economy.
 - ❖ Time series analysis of determinants of short and long term dynamics of
 - ❖ 45 sector average real wage rate
 - ❖ 41 sector demand for employment
 - ❖ Government share based on application of tax and subsidy rates on production and products

Distinctive features of MEMSA

- ❖ MEMSA 's bottom up structure consists of more than 3200 equations and more than 400 behavioural equations.
- ❖ Utilises modern time series estimation methods to build the model's system of equations.
- ❖ Built on broad pluralistic theoretical foundations and relevant empirical literature.
- ❖ The equations capture the structure of the National Income and Product Account (NIPA) in a highly disaggregated manner that includes 7 estimated variables for 41 economic sectors. The model includes:
 - 45 categories of investment
 - 45 categories of employment
 - 45 categories of average remuneration rates
 - 45 categories of outputs
 - 45 categories of exports
 - 45 categories of imports
 - 103 categories of prices
 - 26 categories of private consumption expenditure
 - 16 categories of private sector's income and expenditure
 - 16 categories of households income and expenditure
 - 28 categories of government sector income and expenditure

MEMSA's Economic Sectors

7 variables for each sector: output, employment, investment, exports, imports, prices, wage rates

Primary

1. Agriculture, Forestry and Fishing
2. Coal Mining
3. Gold, uranium and ore mining
4. Other mining

Manufacturing

5. Food
6. Beverage
7. Tobacco
8. Textiles
9. Wearing Apparel
10. Leather and Leather products
11. Footwear
12. Wood and wood products
13. Paper and paper products
14. Printing, publishing and recorded media
15. Coke & refined petroleum products
16. Basic chemicals
17. Other chemicals & man made fibres
18. Rubber products
19. Plastic products
20. Glass and glass products
21. Non-metallic minerals
22. Basic iron & steel
23. Basic non-ferrous metals
24. Metal products excl.machinery
25. Machinery and equipment
26. Electrical equipment
27. Tv, radio & communication equipment
28. Professional & scientific equipment
29. Motor vehicles, parts & accessories
30. Other transport equipment
31. Furniture
32. Other industries

Services

33. Electricity, Gas and water
34. Building construction and engineering
35. Wholesale, retail trade, catering & accommodation services
36. Transport, storage, and communication
37. Financial services, business intermediation, insurance & real estate
38. Community, social & personal services
39. Other services
40. Households
41. General government

Aggregate Sectors

42. Total primary (sum of sectors 1 to 4)
43. Total manufacturing (sum of sectors 5 to 32)
44. Total services (sum of sectors 33 to 41)
45. Total economy (sum of sectors 1 to 41)

Distinctive features of SATTSIM

- ❖ The ADRS South African Tax and Transfer Simulation Model (SATTSIM) is the microeconomic model underlying DIMMSIM.
- ❖ SATTSIM is a full microsimulation model.
- ❖ By linking government tax and transfer policies to individuals, families and households it can facilitate simulation of eligibility, budgetary, poverty and distribution impact of changes in direct and indirect taxes, social security and public works programmes.

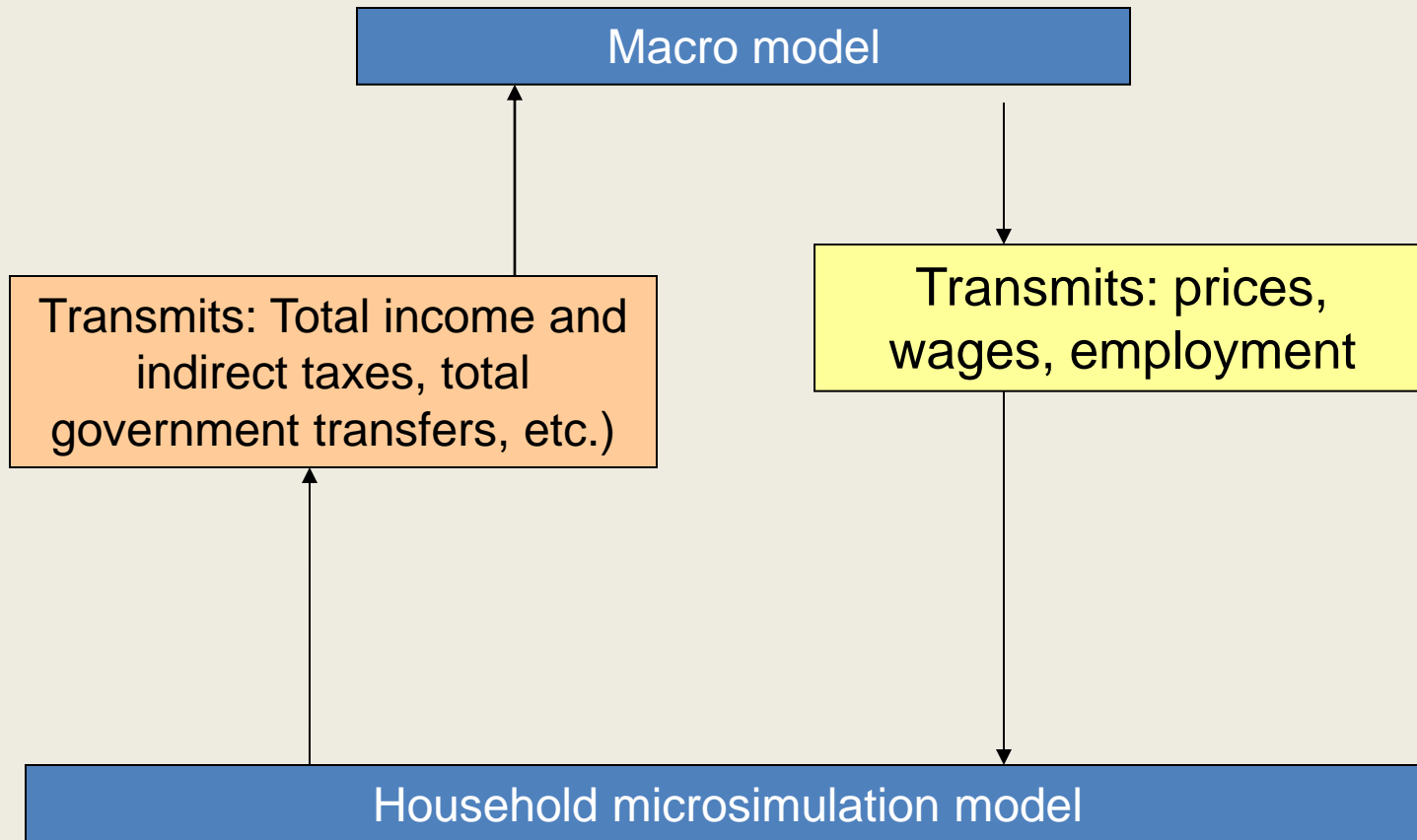
Distinctive features of SATTSIM

- ❖ Database of detailed demographic, work, income and expenditure information of 30,000 households made up of 62,000 families and about 125,000 individuals.
- ❖ Database of policy parameters related to government tax, social security and EPWP policies and programmes.
- ❖ Two tax modules that use computer codes to parameterise and capture the details of current income tax and indirect tax policies.
- ❖ Eleven social security and public works modules use computer codes to parameterise and capture eligibility and entitlement conditions of government social security programmes (e.g., child support, disability grant, etc.), several grant programmes (e.g., basic income grant, care giver grant, etc.), and the expanded public works programme (EPWP).
- ❖ Modules impute receipt of social security, tax liability, poverty and income inequality
- ❖ Modules produce aggregate and cross tabulation of results by gender, race, province, family type, locality and quintile.

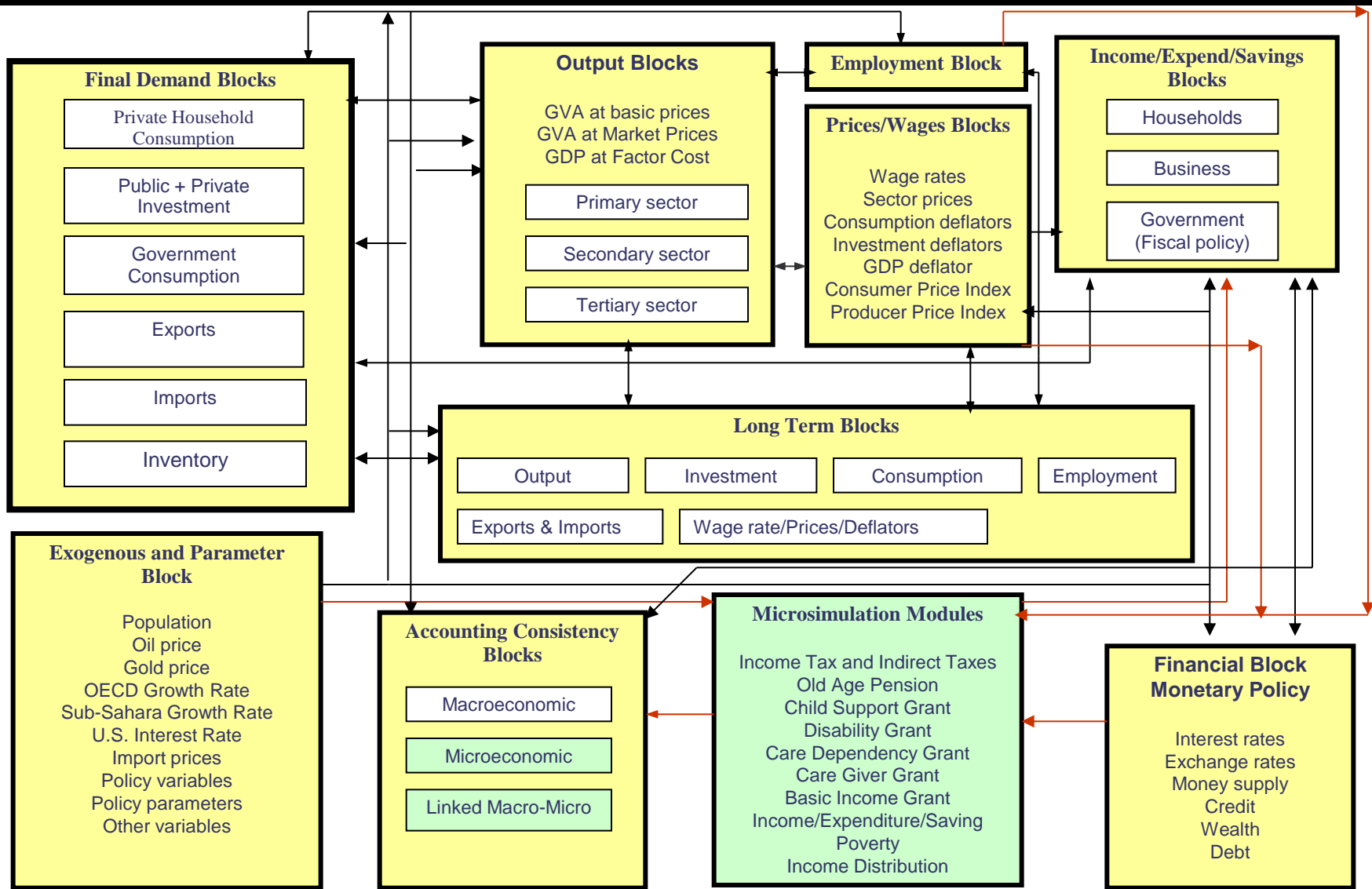
Interaction between DIMMSIM macro and micro models

- ❖ The model's computer programme transmits macro model results (e.g., prices, wages, employment) to the microsimulation component and transmits microsimulation results (e.g., total taxes, total government transfers, etc.) to the macro model.
- ❖ Model solutions are consistent between macro and micro models in terms of government transfers to and income from households, direct and indirect taxes, and other variables that link the two models.

DIMMSIM's two-way macro-micro links



Dynamically Integrated Macro-Micro Simulation Model (DIMMSIM)



DIMMSIM National Minimum Wage Module

- ❖ Facilitates the design and simulation of various formulations of the national minimum wage (NMW) for South Africa.
- ❖ Estimates and transmits the magnitudes of annual shocks to the macro model's economic sector's average real remuneration rates due to the introduction of alternative NMW scenarios.

DIMMSIM National Minimum Wage Module

- ❖ Accommodates temporary or permanent sectoral exemptions, annual variations/adjustments to the NMW, and the introduction of NMW as a flat rate or indexed form.
- ❖ For each scenario, adjusts the wage income of existing full time employees whose wage rates are below the scenario's NMW rate.

II. SCENARIOS OF THE NATIONAL MINIMUM WAGE

NMW Policy Scenarios

Objectives: to quantify the likely impact of alternative NMW policies for the South African economy.

Five Scenarios: One base scenario and four NMW scenarios

No NMW: Base Scenario

The Base Scenario captures the economy 'as it is' with no NMW. It reflects 'what if' economic performance continues its current low growth and employment path.

Key features of the Base Scenario:

❖ **Fiscal Policy:** Captures Treasury's current concern about the Debt-GDP ratio and sets low annual targets for the deficit-GDP ratio. Thus, the Base Scenario strives to achieve a balanced or close to balanced annual budget.

❖ **Monetary Policy:** Adheres to government's current inflation target policy and assumes that the policy will remain unchanged over the next 5 years. For the model, this means that monetary authorities will use the interest rate to keep inflation within the 3 to 6 percentage target band.

No NMW: Base Scenario

- ❖ **Public Investment:** Nominal investment by general government and public corporations is designed to increase by 6% annually during the projection period.
- ❖ **Government Final Consumption (GFC) Expenditure:** GFC is expected to grow by 6.2% annually in nominal terms, which corresponds to the MTEF's current average annual rate.
- ❖ **International Outlook:** Assumes that average real annual growth rate for the OECD and Sub-Saharan countries will be 1% and 5% respectively, over the next 10 years. The price of a barrel of crude oil is set to gradually increase to 70 US Dollar by 2025.

No NMW: Base Scenario

- ❖ **Taxes, Social Grants and EPWP:** The scenario assumes that all nominal parameters related to direct and indirect taxes, social grants and EPWP (e.g., tax brackets, grant amounts) increase by 6 percent annually during the projection period.
- ❖ **Poverty Line:** The scenario adopts poverty line of R680 per capita and R930 per adult equivalent per month for 2015. Both poverty lines are adjusted by 6 percent annually.

NMW: A Minimal Scenario

The Minimal Scenario expands coverage of the minimum wage without increasing labour costs for the majority of firms. Thus, it sets a NMW near the level of the lowest sectoral determinations.

Key features:

- ❖ Sets NMW for 2016 at R2250 per month, which is basically the same as adjusting the lowest sectoral wage determinations in 2015 by inflation (6 percent).
- ❖ NMW is annually adjusted for inflation after 2016.

NMW: Indexed 40% Scenario

This scenario progressively increases the value of the NMW relative to an index. It reflects the OECD norm of establishing a minimum wage that corresponds to the mean wage.

Key features:

- ❖ NMW is indexed to the inflation adjusted average wage rate of full time workers.
- ❖ In 2016 NMW is indexed to 40% of the 2015 mean wage for all full time workers, or R3467.
- ❖ The index is annually increased by 1% until it reaches 45% of the inflation adjusted 2015 mean wage rate by 2021.
- ❖ After 2021, the NMW annually adjusts for inflation with the index kept at 45%.
- ❖ For three very low-wage sectors, different rates are set as a percentage of the NMW for each year:
 - ❖ Agriculture minimum wage is set to 80% of the NMW.
 - ❖ Domestic workers and EPWP minimum wage rates are set at at 70% of the NMW.

NMW: Indexed 45% Scenario

This scenario targets the living standards of a larger portion of workers.

Key features:

- ❖ NMW is indexed to the inflation adjusted average wage rate of full time formal sector workers.
- ❖ In 2016 NMW is indexed to 45% of the 2015 mean wage of full time formal sector workers, excluding agriculture and domestic work, or R4623.
- ❖ The index increases annually by 1% until it reaches 50% of the inflation adjusted 2015 mean wage rate by 2021.
- ❖ After 2021, the NMW annually adjusts for inflation with the index kept at 50%.
- ❖ For three very low-wage sectors, different rates are set as a percentage of the NMW for each year. For agriculture, the rate is set to 80% of the NMW. For domestic workers and the EPWP the rate is set at 70% of the NMW.

NMW: A Maximal Scenario

This scenario captures the transformation of South Africa's wage structure in a far-reaching manner by using a higher starting minimum wage.

Key features:

- ❖ NMW begins in 2016 at R6000 to ensure that 65% of full-time workers are covered by the measure.
- ❖ It annually adjusted for inflation plus 2% until 2021.
- ❖ After 2021, the NMW annually adjusts for inflation.
- ❖ For three very low-wage sectors, different rates are set as a percentage of the national minimum wage each year. For agriculture, the rate is set to 80% of the NMW. For domestic work the rate is pegged at 70% of the NMW. For the EPWP the rate is set at 60% of the NMW.

III. NMW DATA SOURCES AND PREPARATION

Breakdown of Sector Employment

- ❖ QLFS 2014 data was used to break down sector employment into 8 categories. Each sector employment category is created in relation to the mean wage rate for the sector:
 - ❖ less than 25% of the mean,
 - ❖ between 25% and 40% of the mean,
 - ❖ between 40% and 50% of the mean,
 - ❖ between 50% and 75% of the mean,
 - ❖ between 75% and 100% of the mean,
 - ❖ between 100% and 150% of the mean,
 - ❖ between 150% and 200% of the mean,
 - ❖ greater than 200% of the mean.
- ❖ Each category includes the number of workers within that category and a corresponding mean wage rate.
- ❖ The prepared data excludes self-employed and part time workers.

Simulations of NMW Policy Scenarios

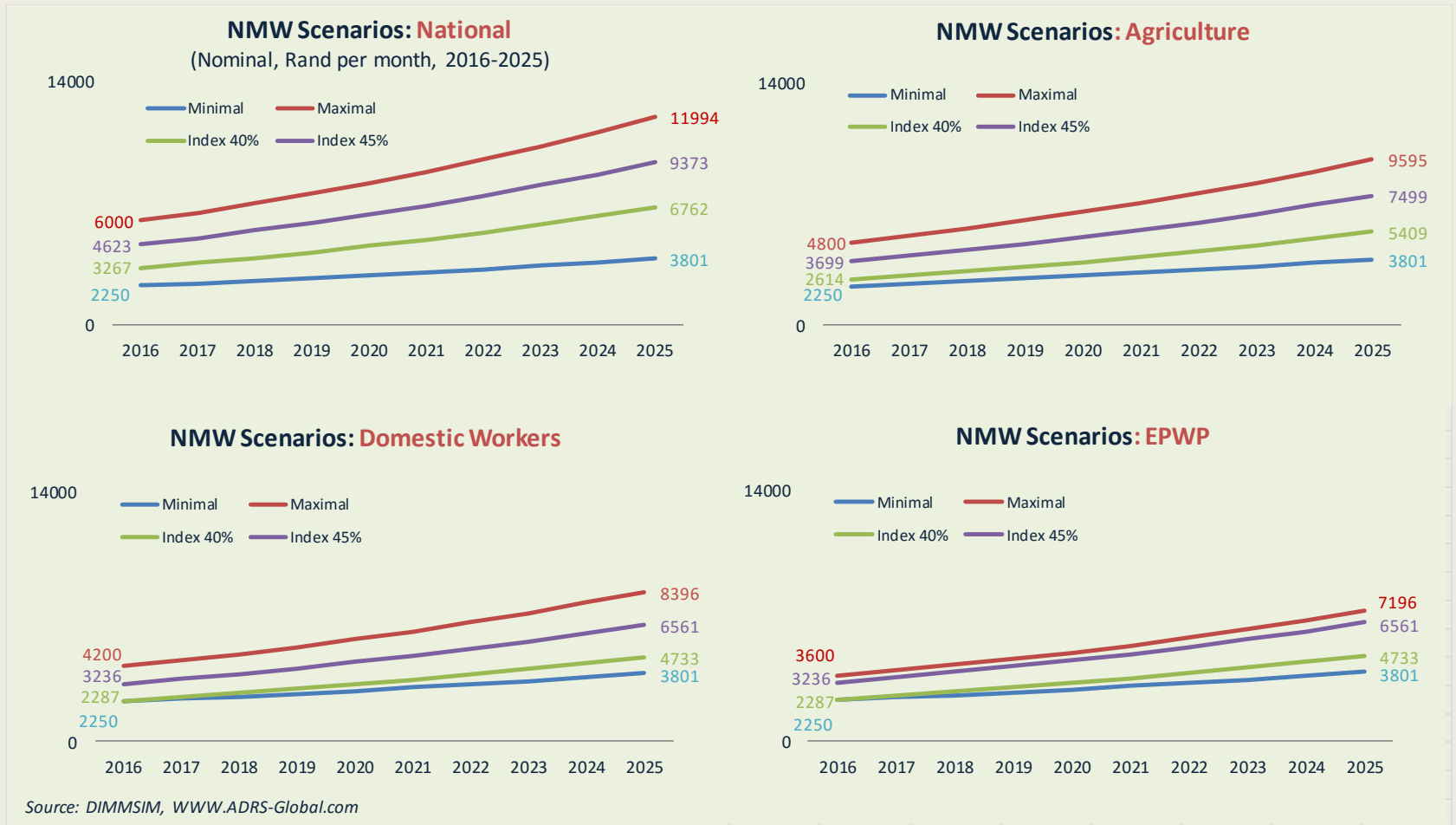
DIMMSIM used specifications of each policy scenario to simulate impact on:

- ❖ Economic indicators at macroeconomic and sector levels
- ❖ Household inequality and poverty

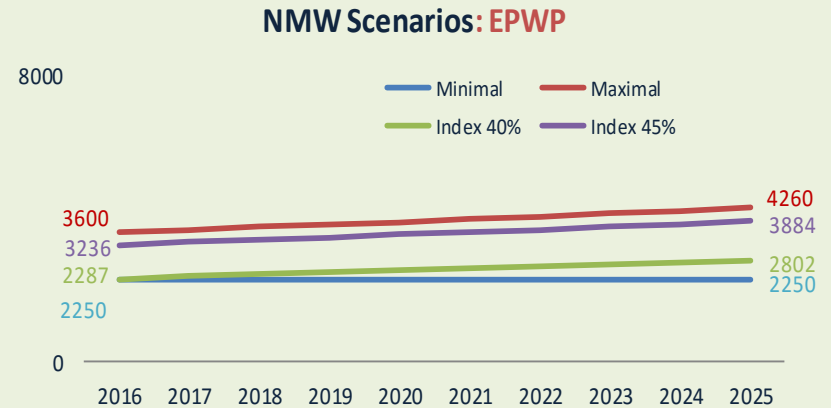
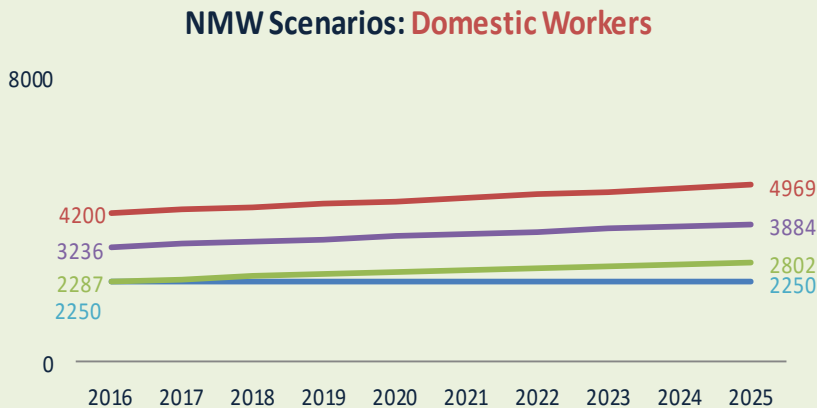
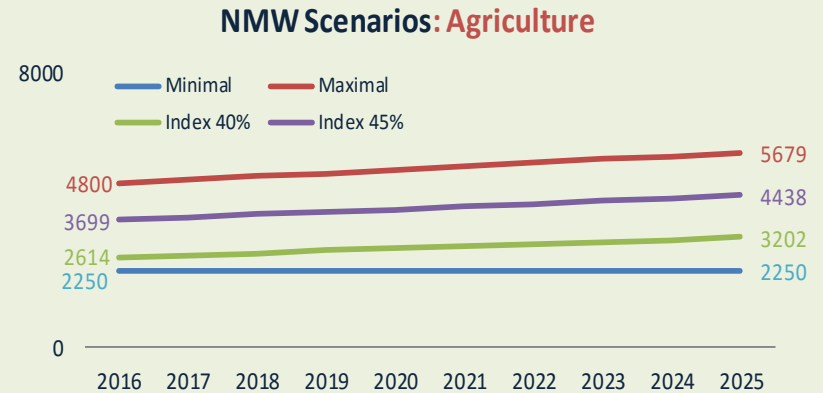
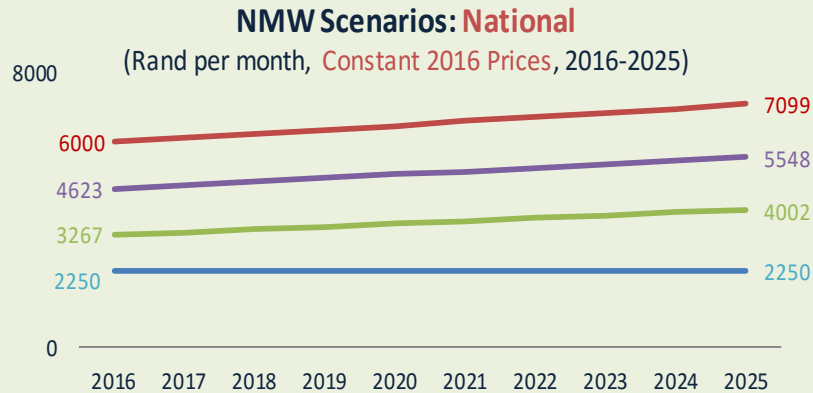
IV. MODEL SIMULATION RESULTS

WAGE RATES

Key Finding: After 2016, **nominal NMW rates** increase between 6% and 8.42%, average annually



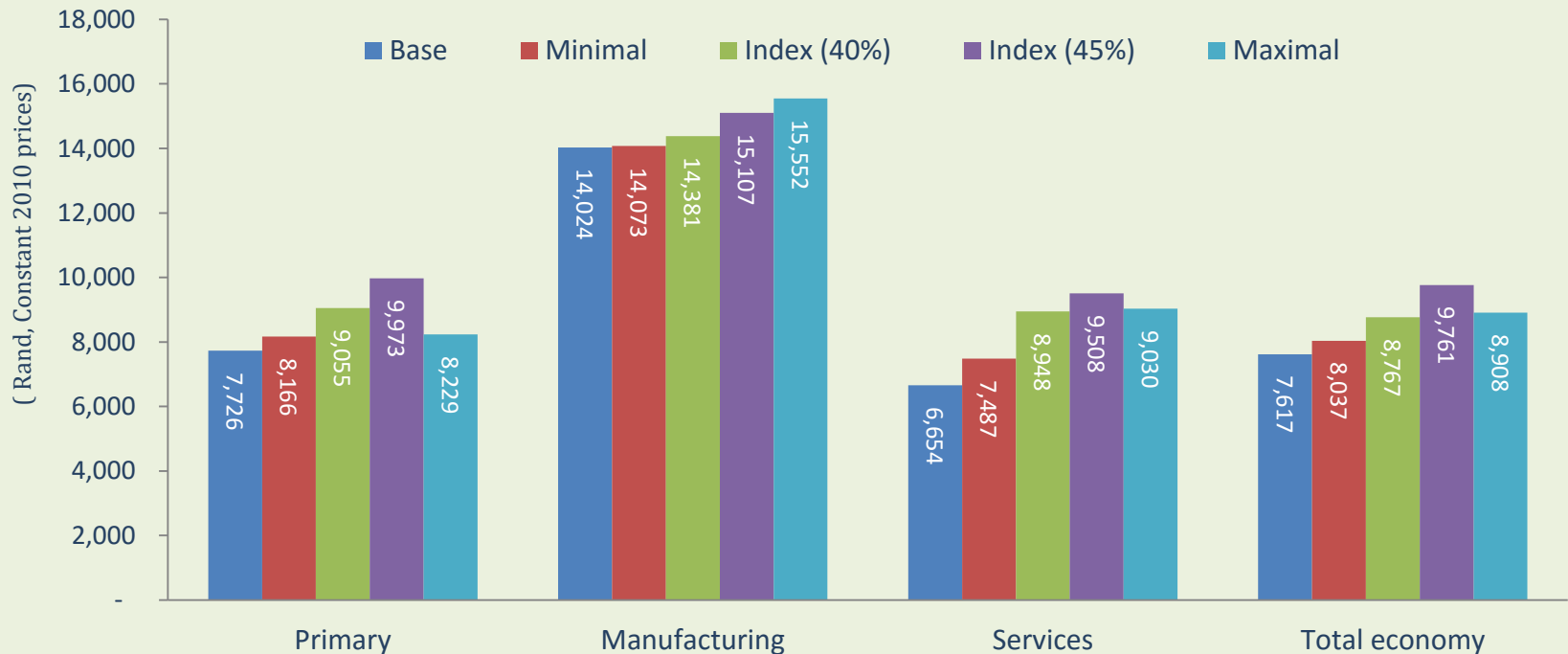
Key Finding: After 2016, **real NMW rates** increase between 0% and 2.28%, average annually



Source: DIMMSIM, WWW.ADRS-Global.com

Key Finding: NMW raises the **average real wage rate** across sectors

NMW and Remuneration (Average monthly, 2016-2025)



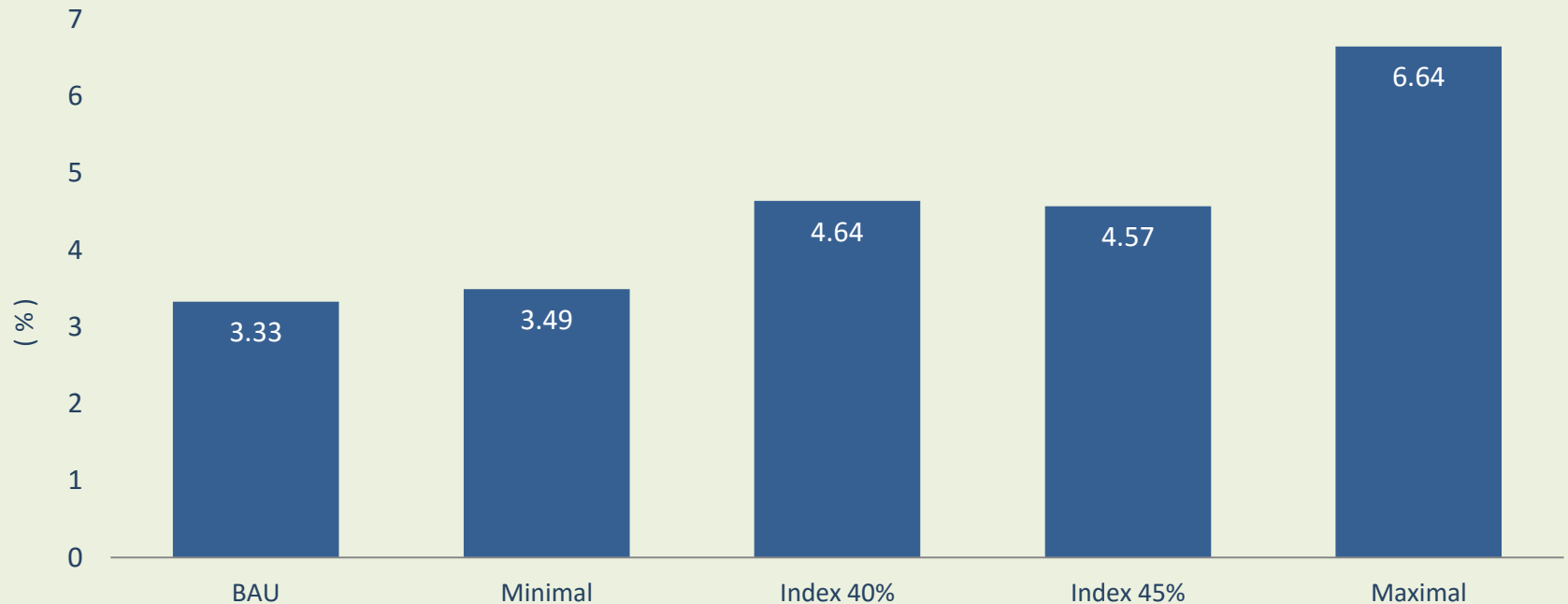
Source: DIMMSIM, www.ADRS-Global.com)

V. MODEL SIMULATION RESULTS: INCOME AND EXPENDITURE

Key Finding: NMW raises household income

Real Household Income

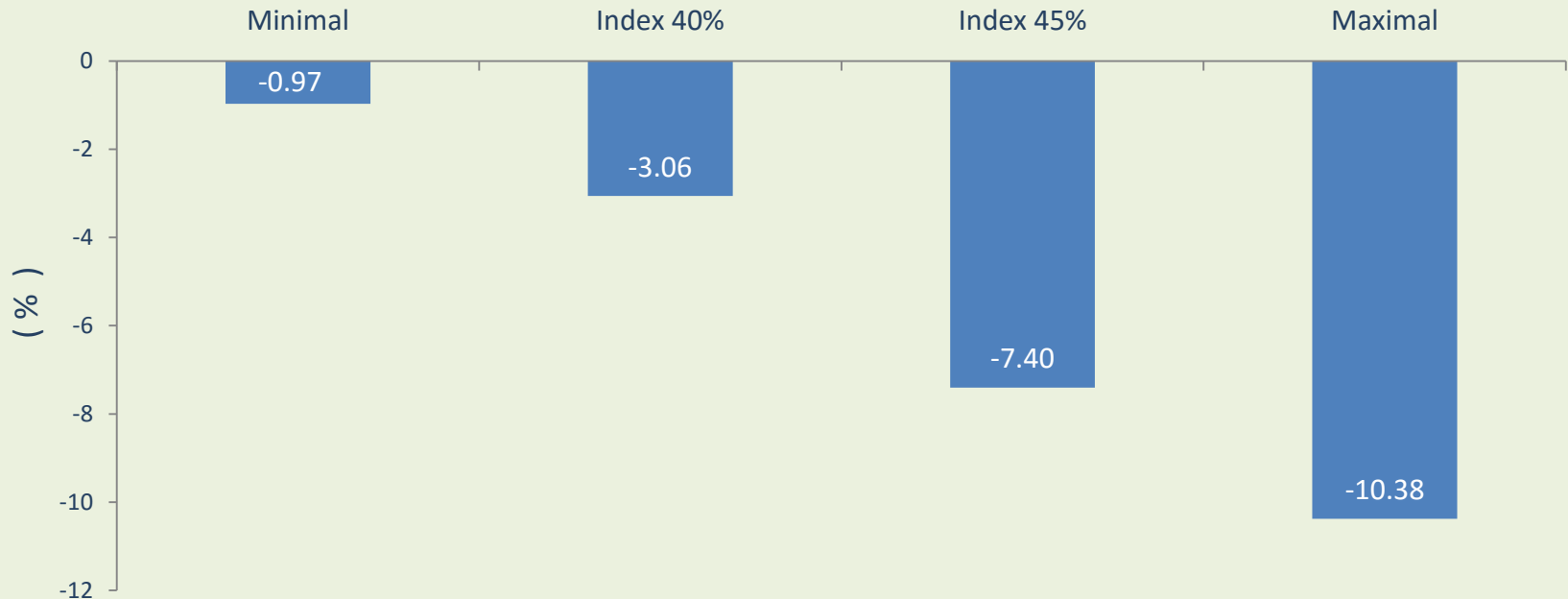
(Avg. Annual Growth Rate, 2016-2025)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: NMW reduces demand for social grants

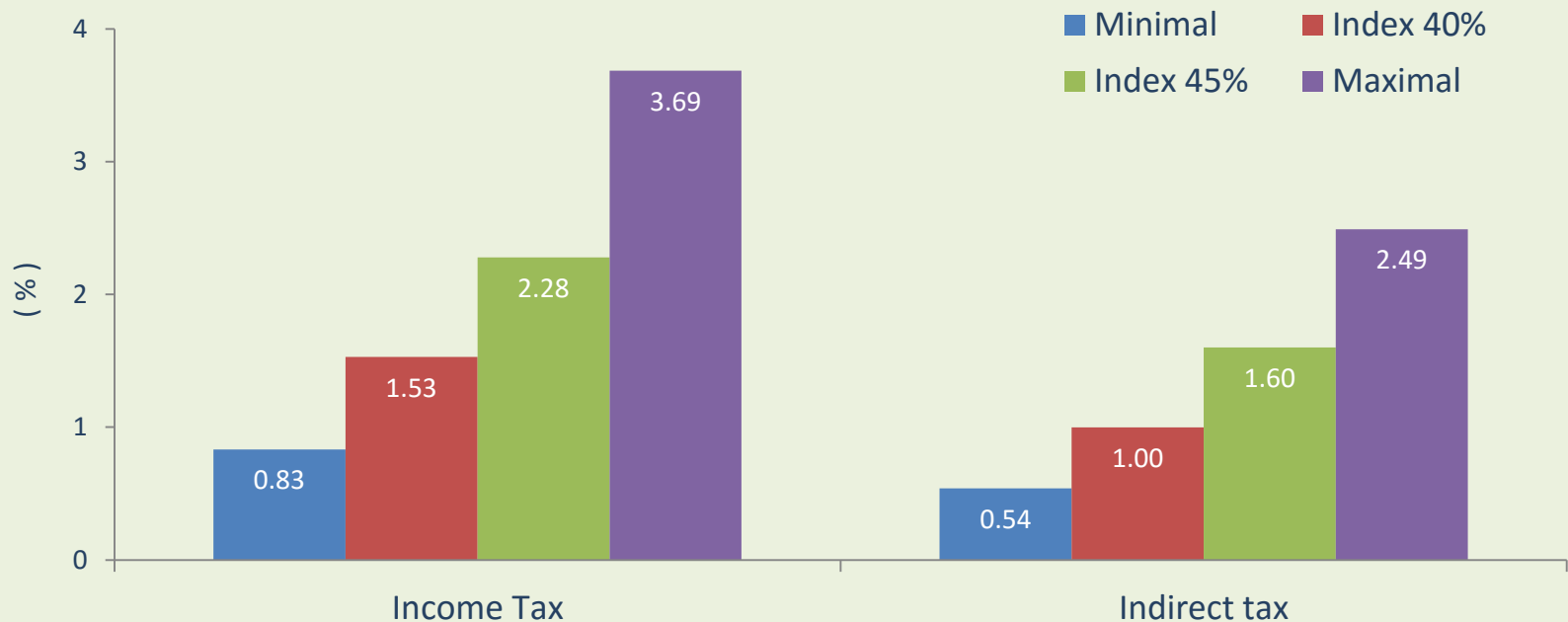
NMW and Demand for Social Security (2025) (% change relative to BAU)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: NMW increases direct and indirect tax revenue

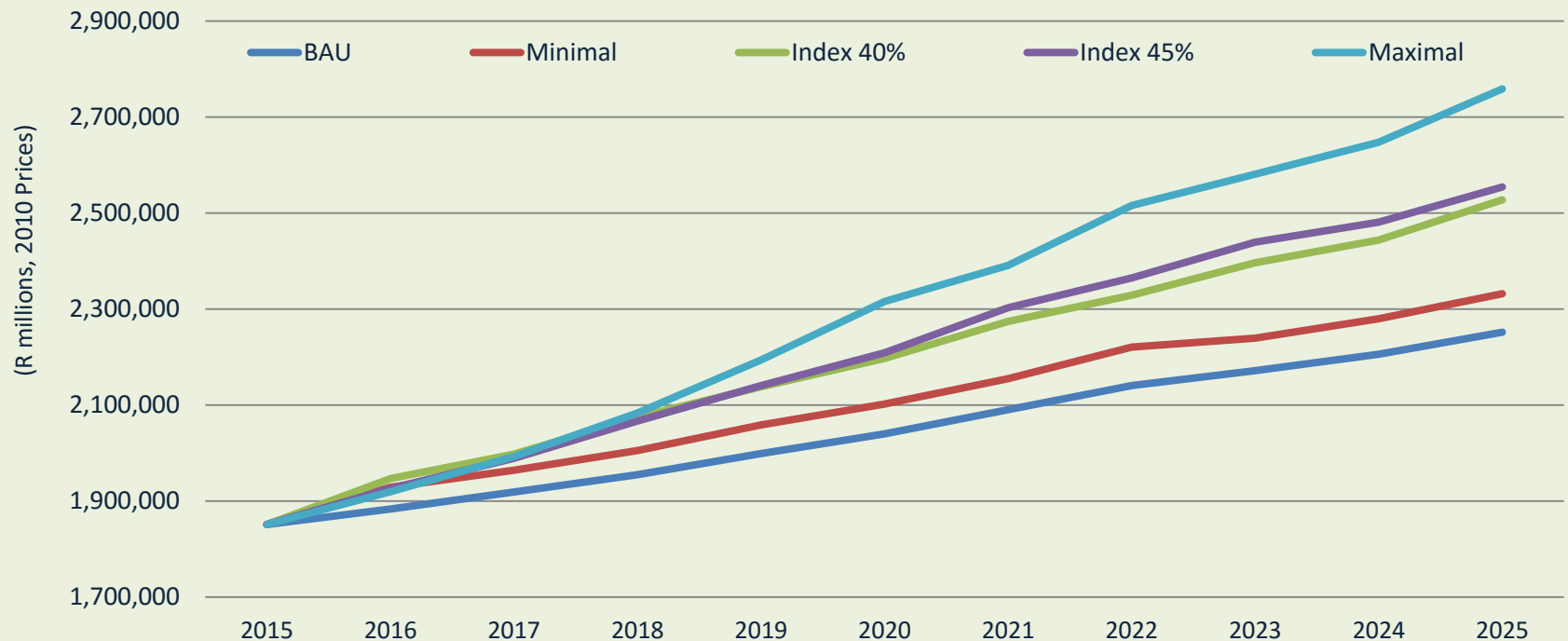
NMW and Tax Revenue from Households (2025) (% difference relative to BAU)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: NMW raises household Consumption Expenditure

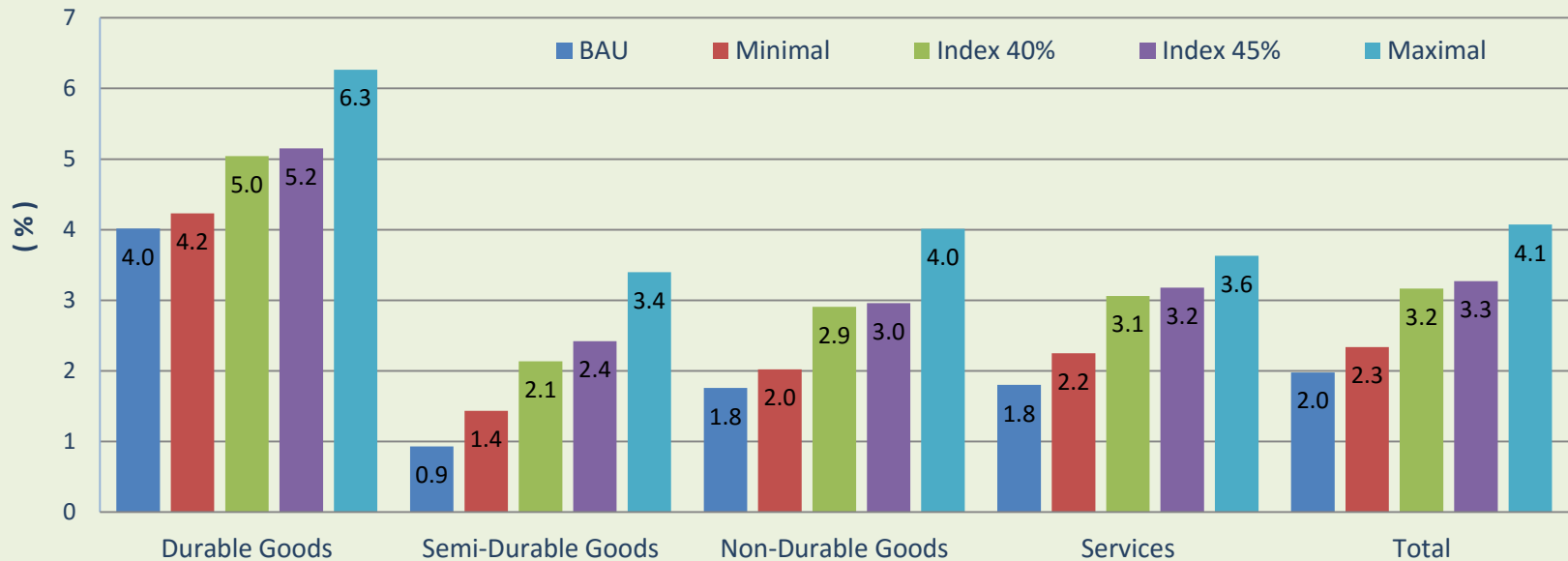
NMW and Household Consumption Expenditure (2015-2025)



Source: DIMMSIM, www.ADRS-Global.com

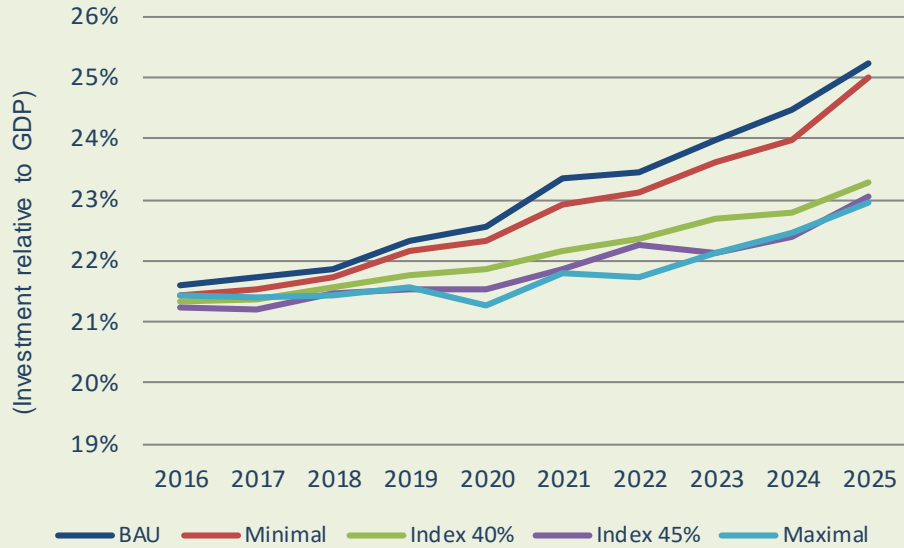
Key Finding: NMW increases household consumption expenditure

Household Real Consumption Expenditure (Avg. annual growth rate, 2015-2025)



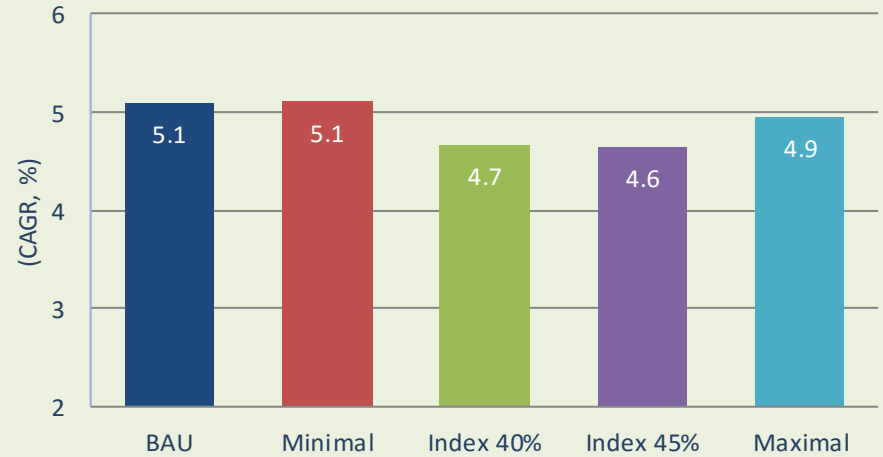
Source: DIMMSIM, www.adrs-global.com

Investment Trends (2016-2025)



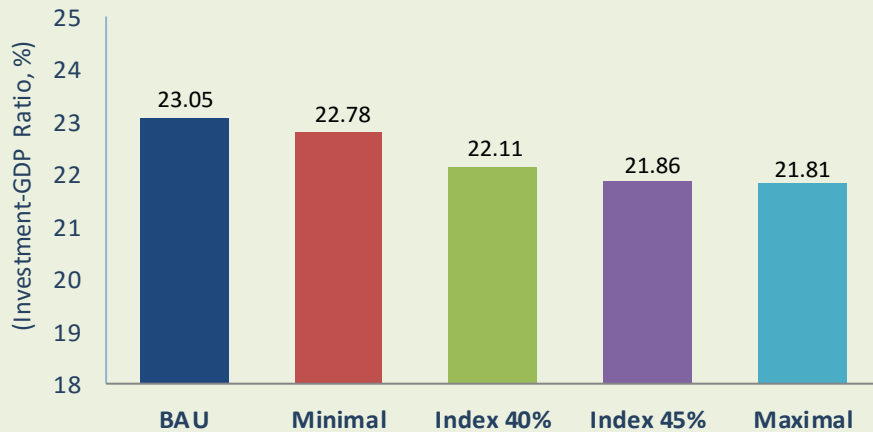
Total Investment Expenditure

(Avg. annual growth rate, 2016-2025)



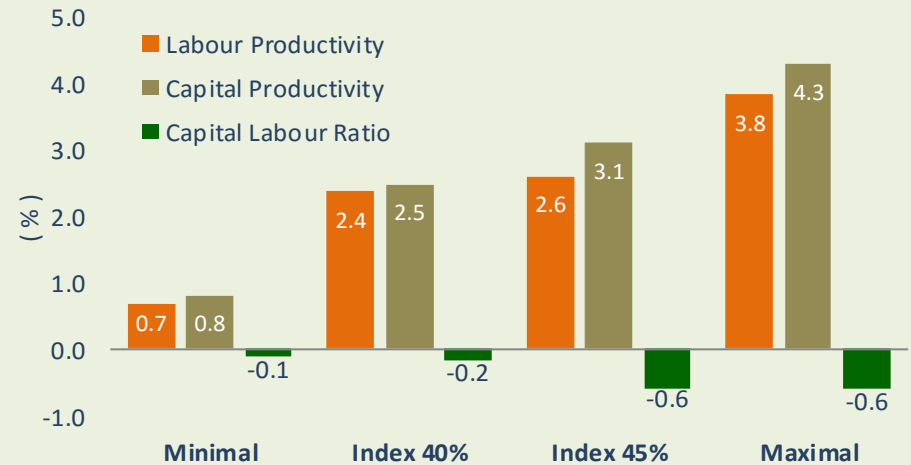
Investment Share (2016-2025)

(Average annual)



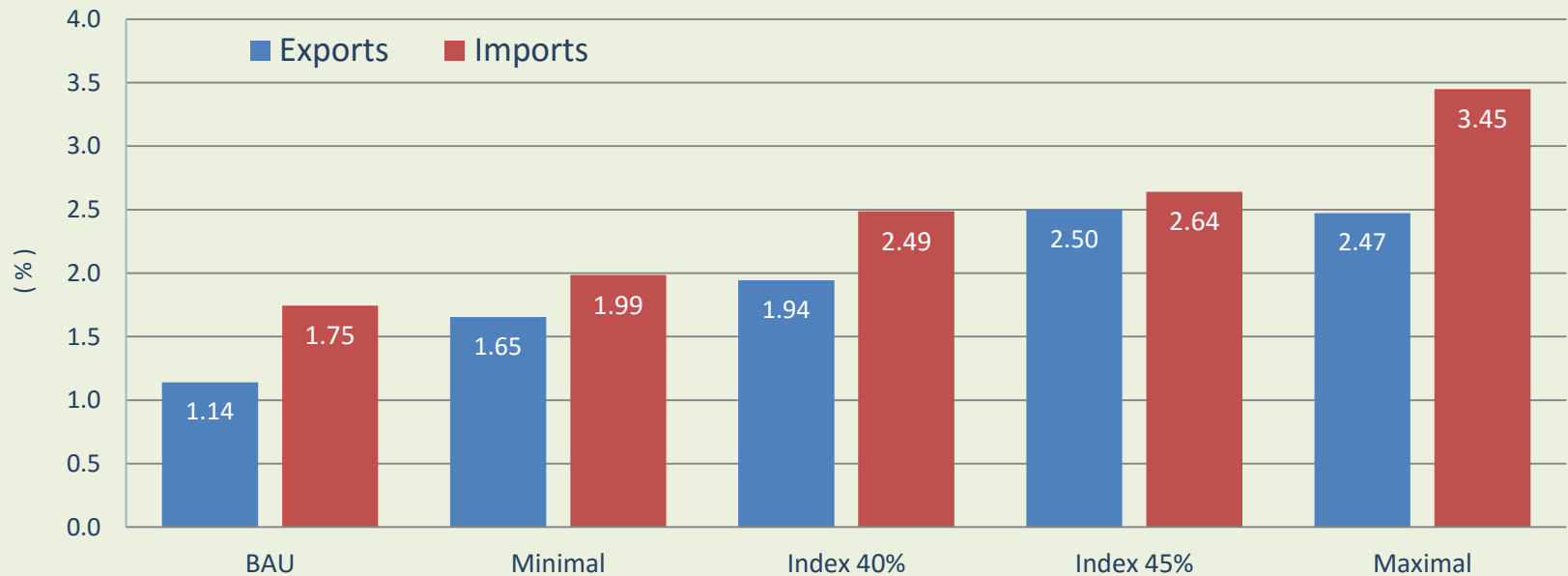
Output, Capital and Labour Ratios

(% change relative to BAU, Avg. annual 2016-2025)



Key Finding: NMW leads to higher exports and imports

NMW and Real Exports and Imports (Avg. annual growth rate, 2016-2025)

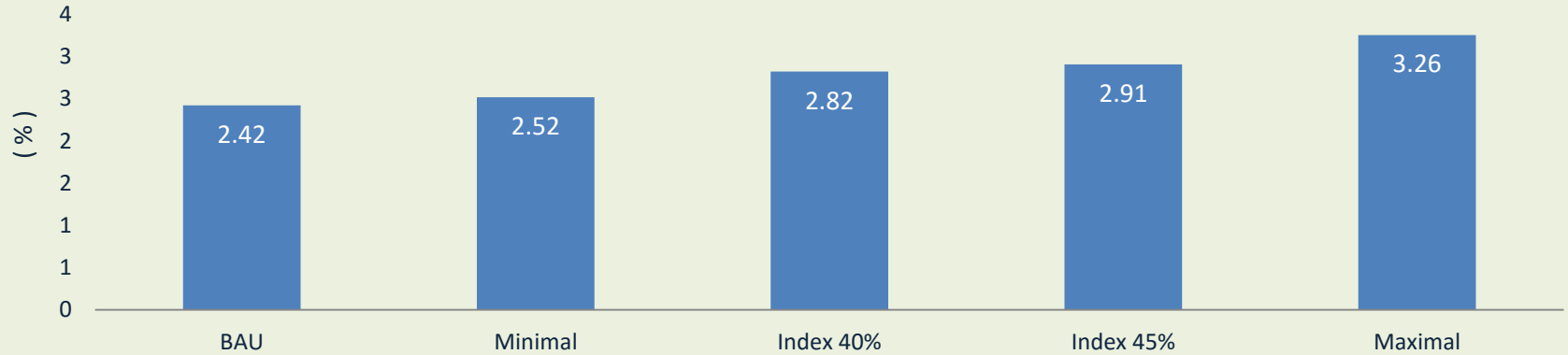


Source: DIMMSIM, www.adrs-global.com

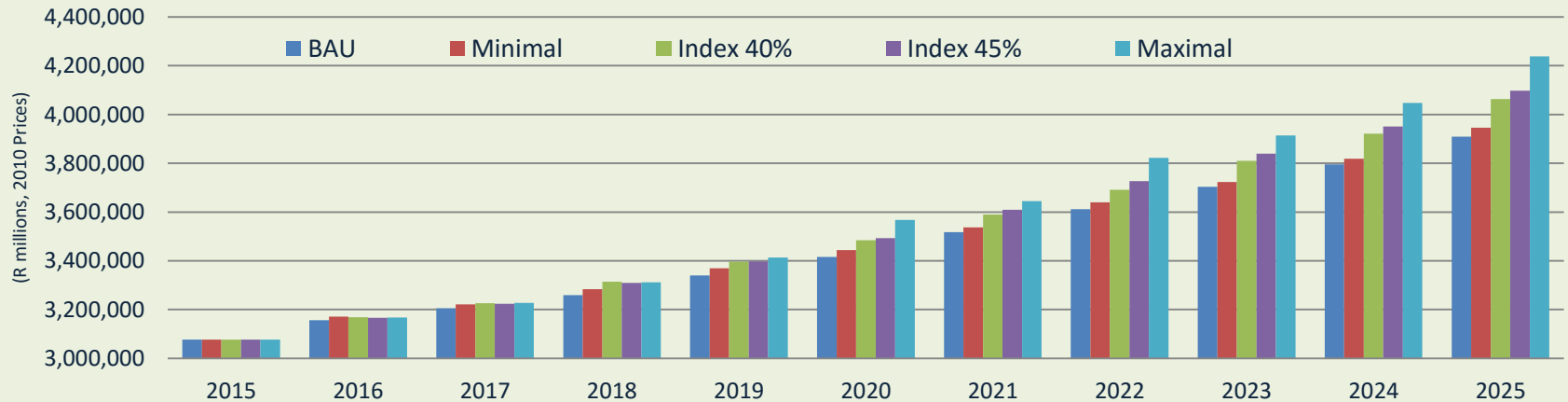
VI. MODEL SIMULATION RESULTS: PRODUCTION AND GROWTH

Key Finding: NMW is pro-growth

NMW and Real GDP Growth (Avg. Annual)

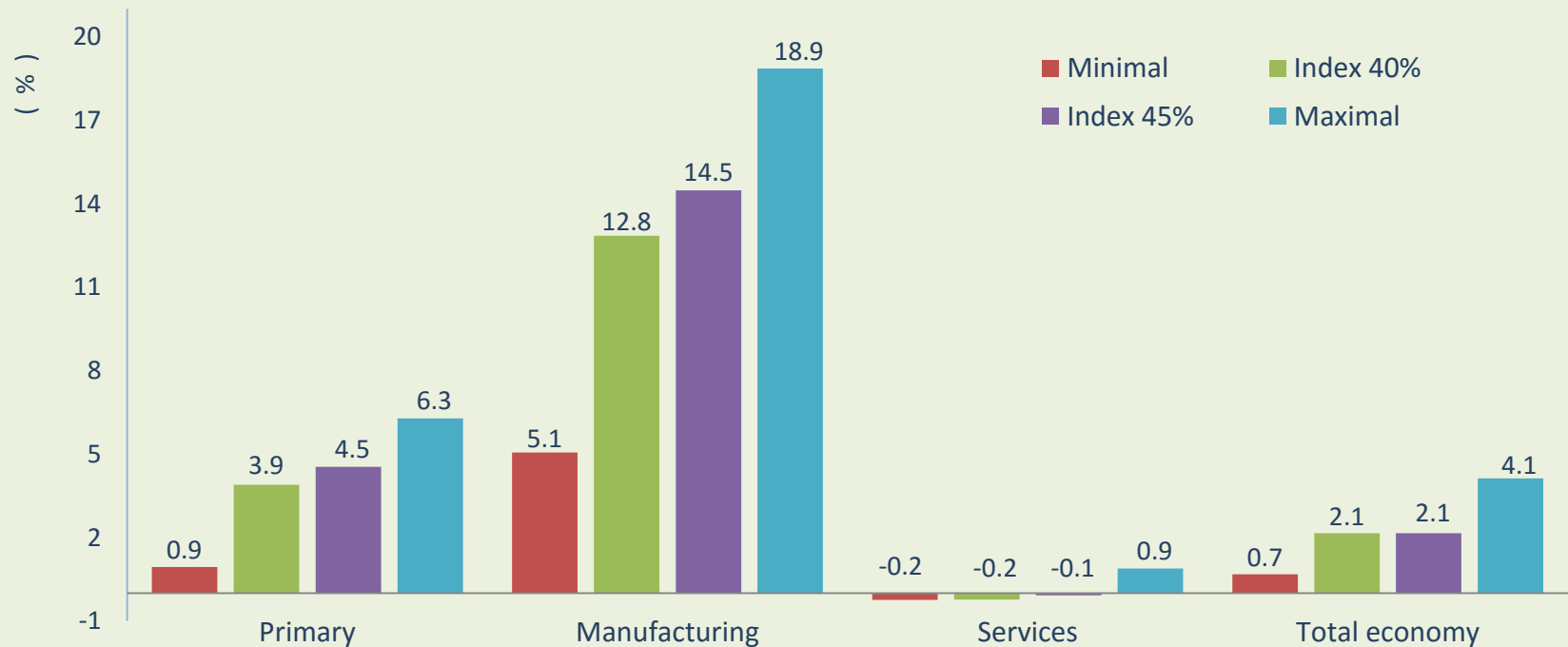


NMW and Gross Domestic Product (GDP)



Key Finding: NMW enhances sector growth

NMW and Economic Output (2016-2025) (% difference relative to BAU, Avg. annual)



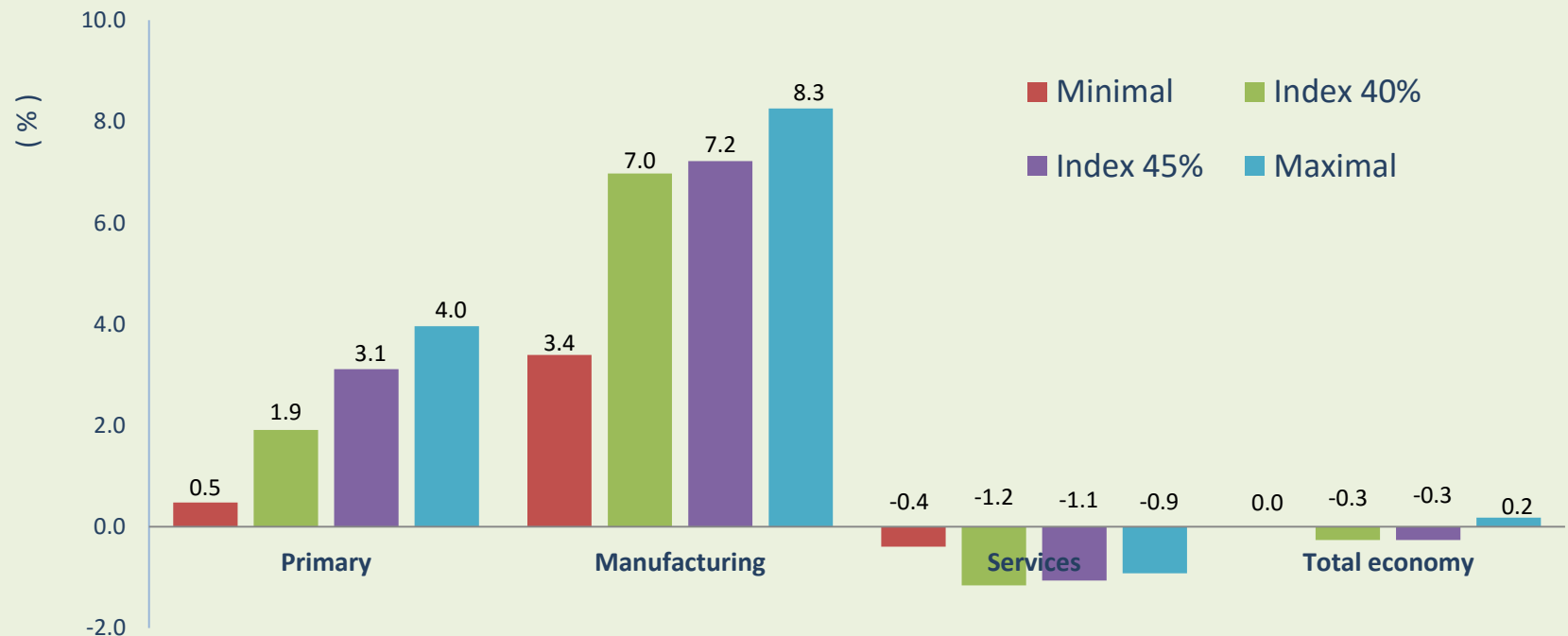
Source: DIMMSIM, www.ADRS-Global.com

VII. MODEL SIMULATION RESULTS: EMPLOYMENT

Key Finding: NMW affects sector employment differently

NMW and Employment (2016-2025)

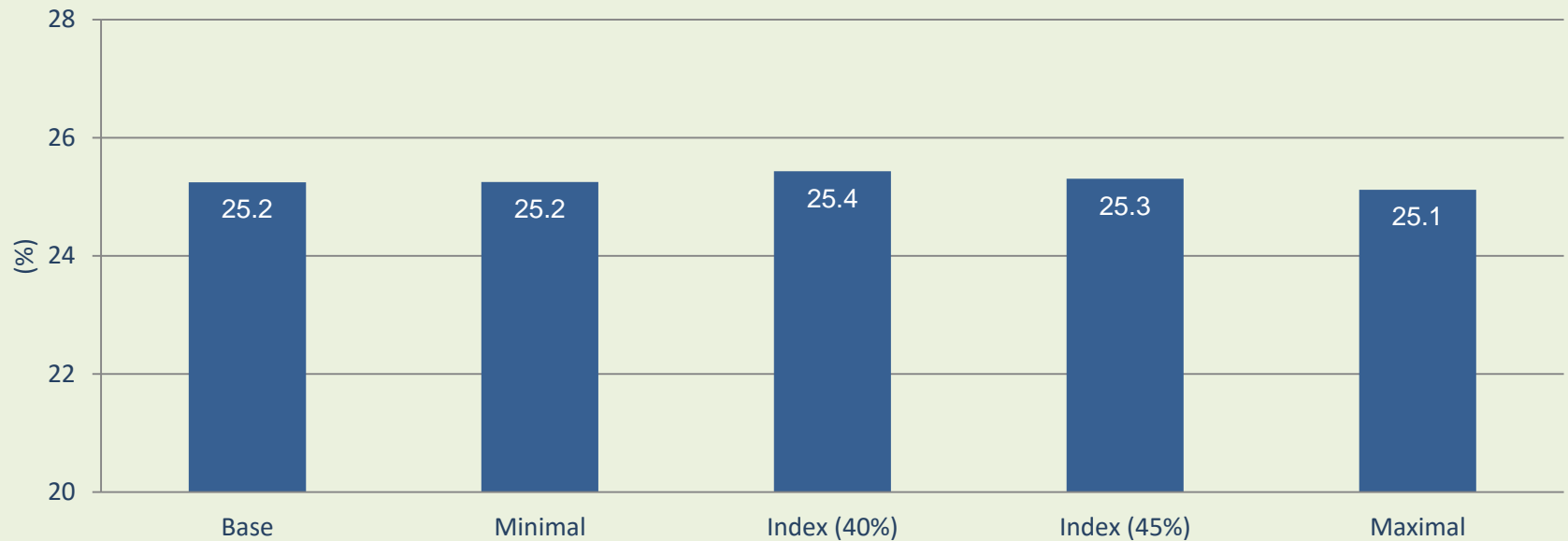
(% difference relative to BAU, Avg. annual)



Source: DIMMSIM, www.adrs-global.com

Key Finding: NMW marginally increases the unemployment rate

NMW and Unemployment Rate (2016-2025) (Ave. Annual)



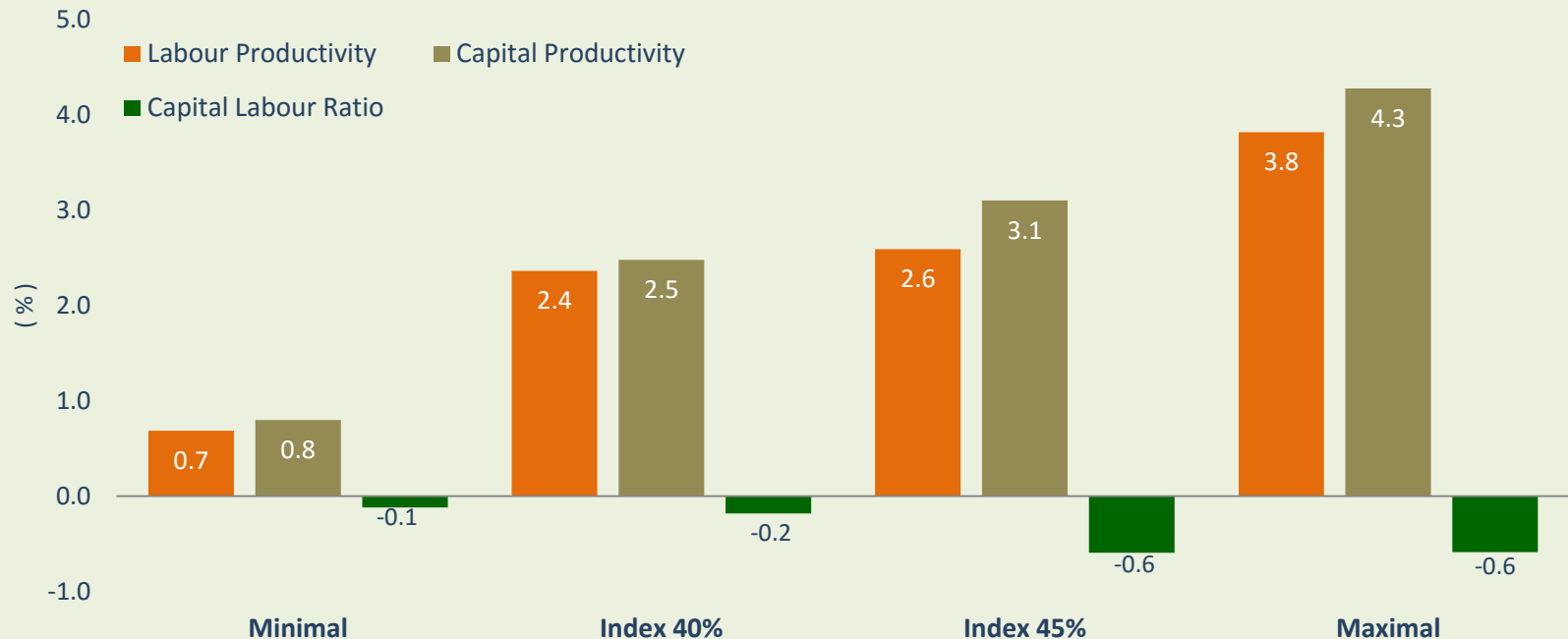
Source: DIMMSIM, www.ADRS-Global.com

VIII. MODEL SIMULATION RESULTS: PRODUCTIVITY, INFLATION AND DEBT

Key Finding: NMW increases productivity that helps producers become less dependent on using capital to expand output

Output, Capital and Labour Ratios

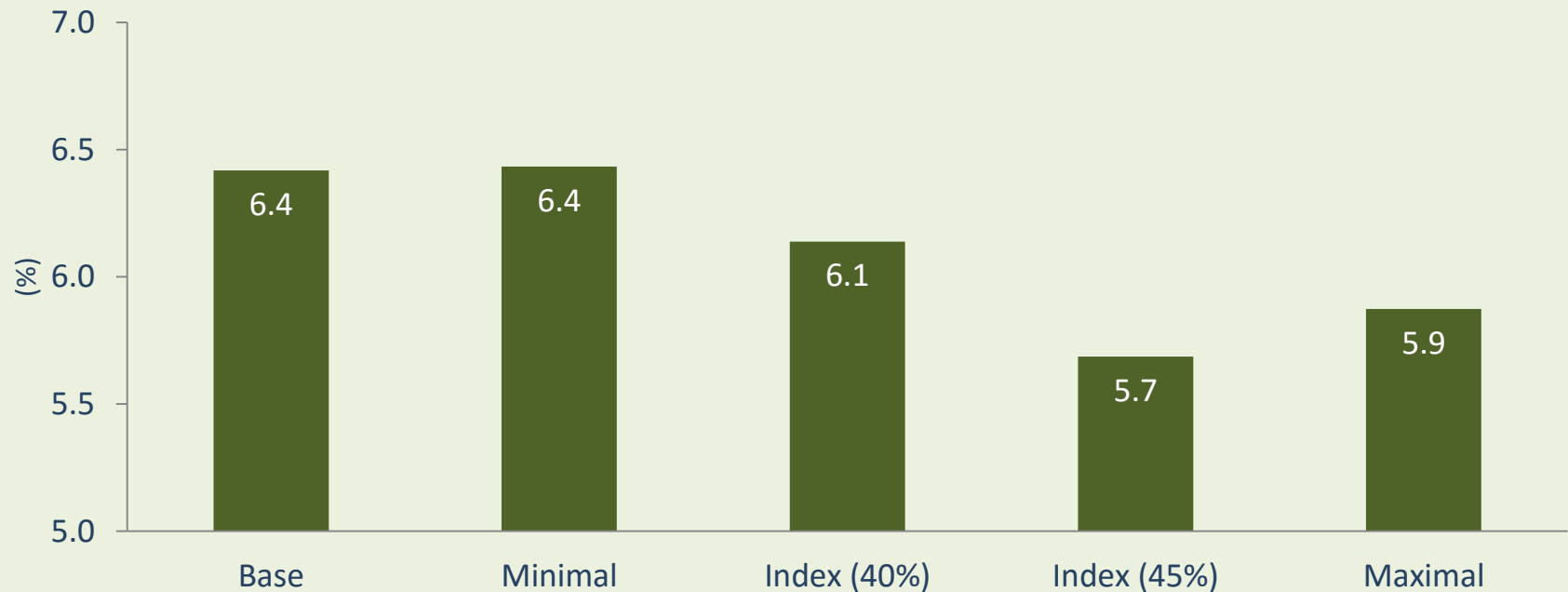
(% change relative to BAU, Avg. annual 2016-2025)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: NMW will be accompanied with stable and low inflation rate

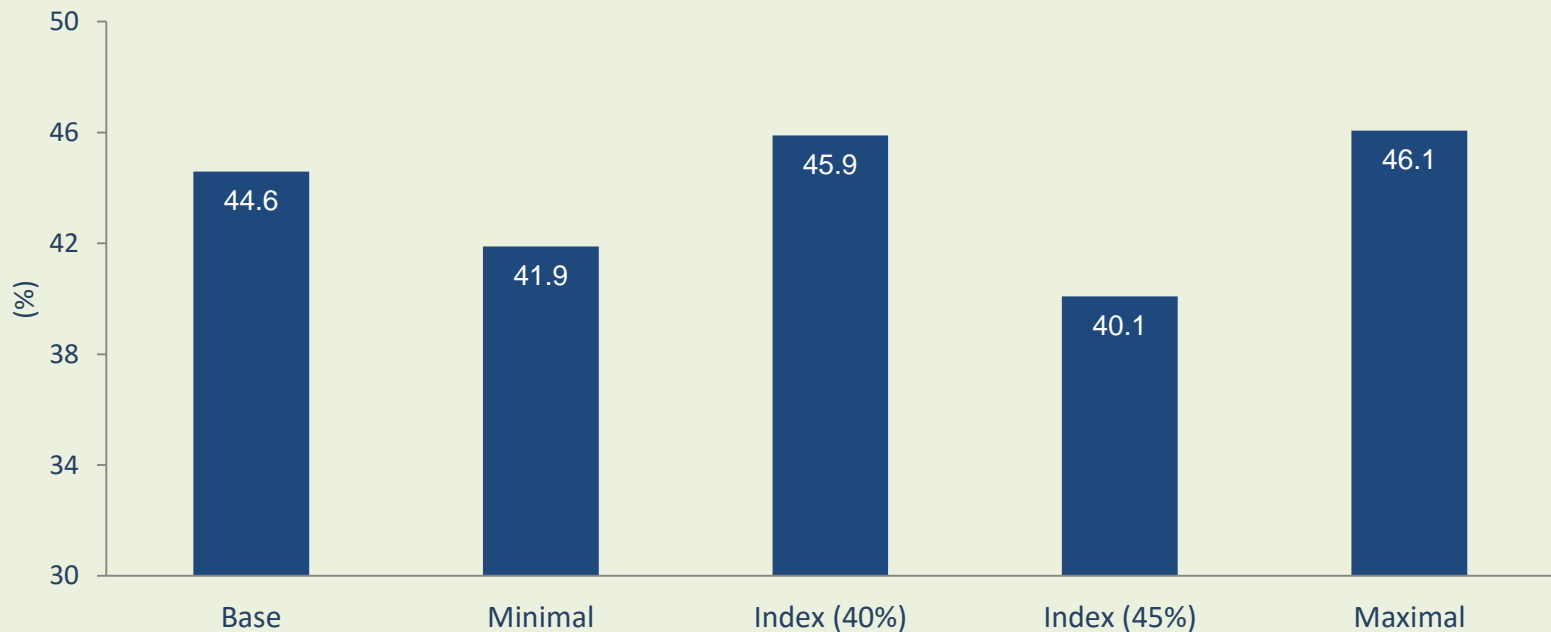
NMW and Inflation Rate (Ave. Annual, 2016-2025)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: The Debt-GDP ratio will be sustainable

NMW and Debt-GDP Ratio (Ave annual, 2016-2025)

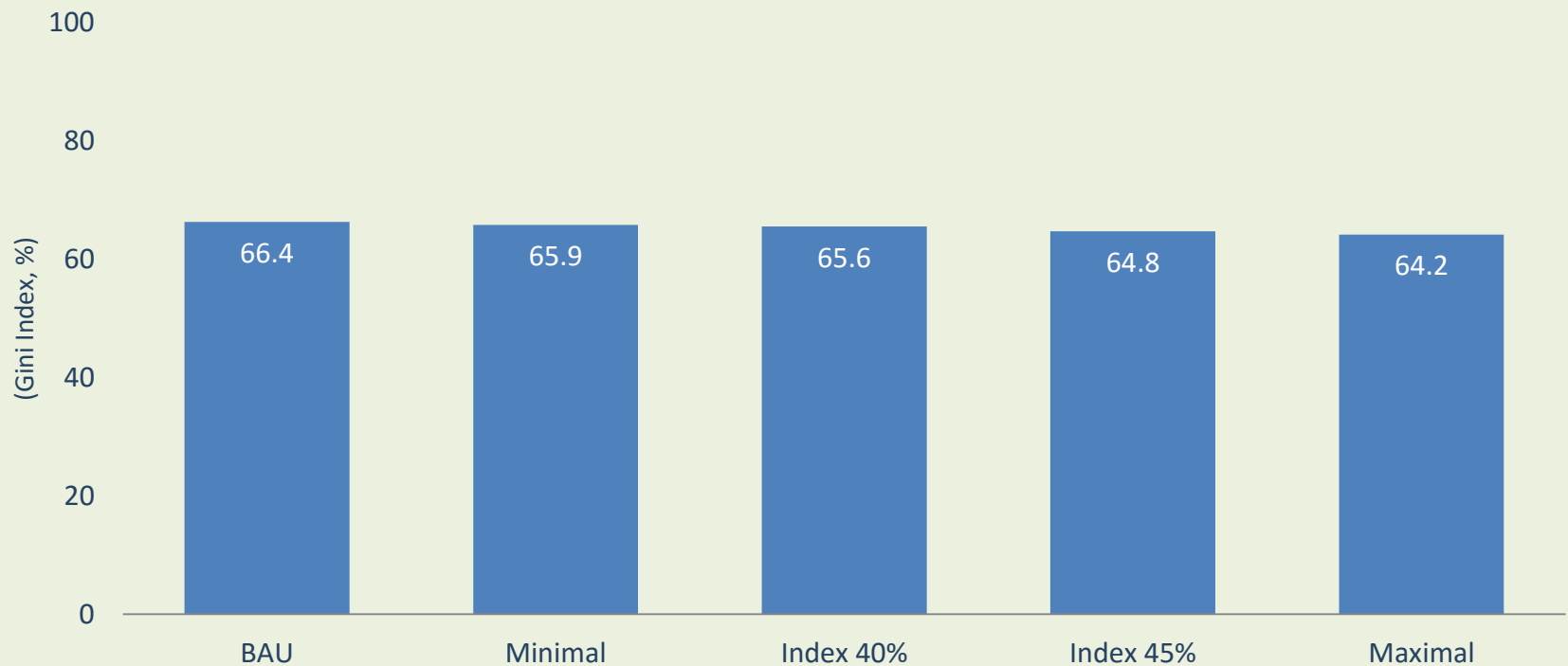


Source: DIMMSIM, www.ADRS-Global.com

IX. MODEL SIMULATION RESULTS: INEQUALITY AND POVERTY

Key Finding: NMW reduces income inequality

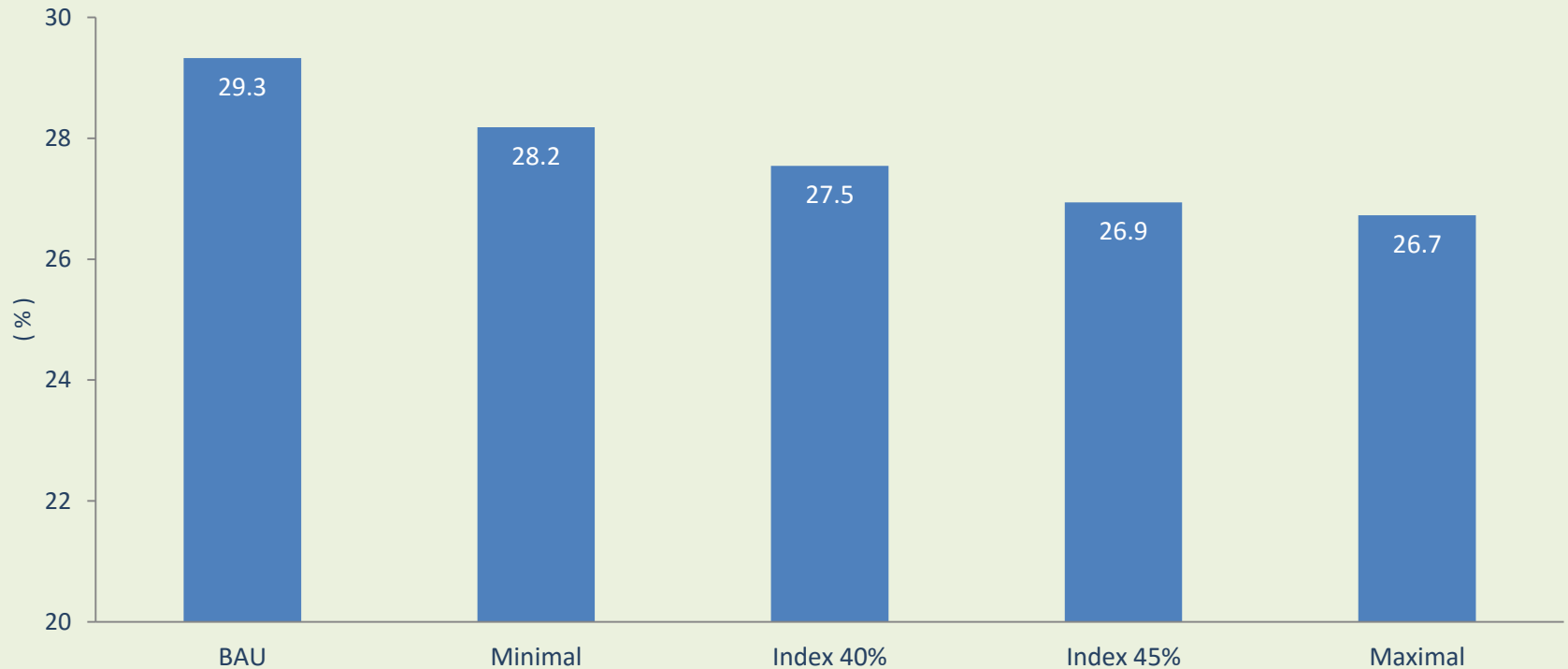
NMW and Income Inequality (2025)



Source: DIMMSIM, WWW.ADRS-Global.com

Key Finding: NMW reduces poverty

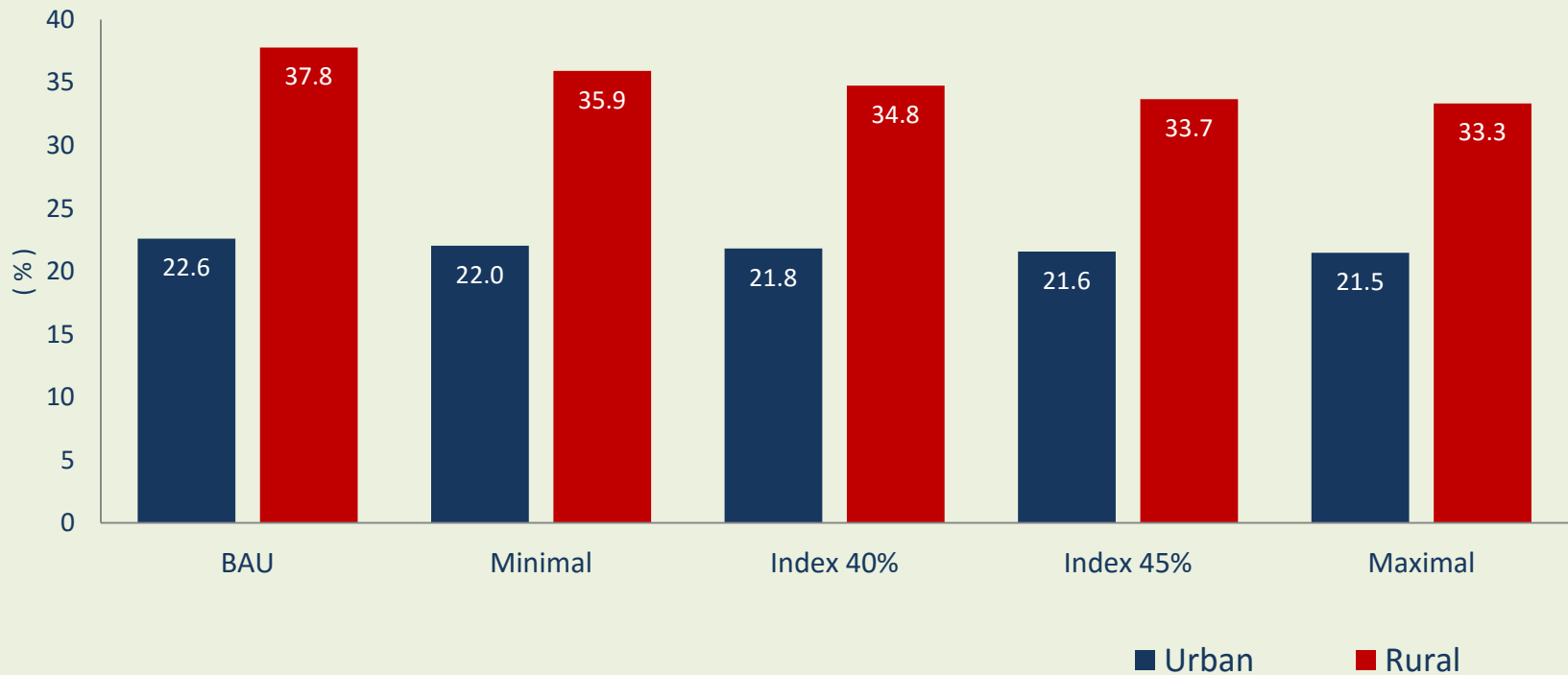
NMW and Poverty Headcounts (2025)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: NMW reduces rural poverty relatively more

NMW and Poverty by Location (2025)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: NMW reduces both male and female poverty rates

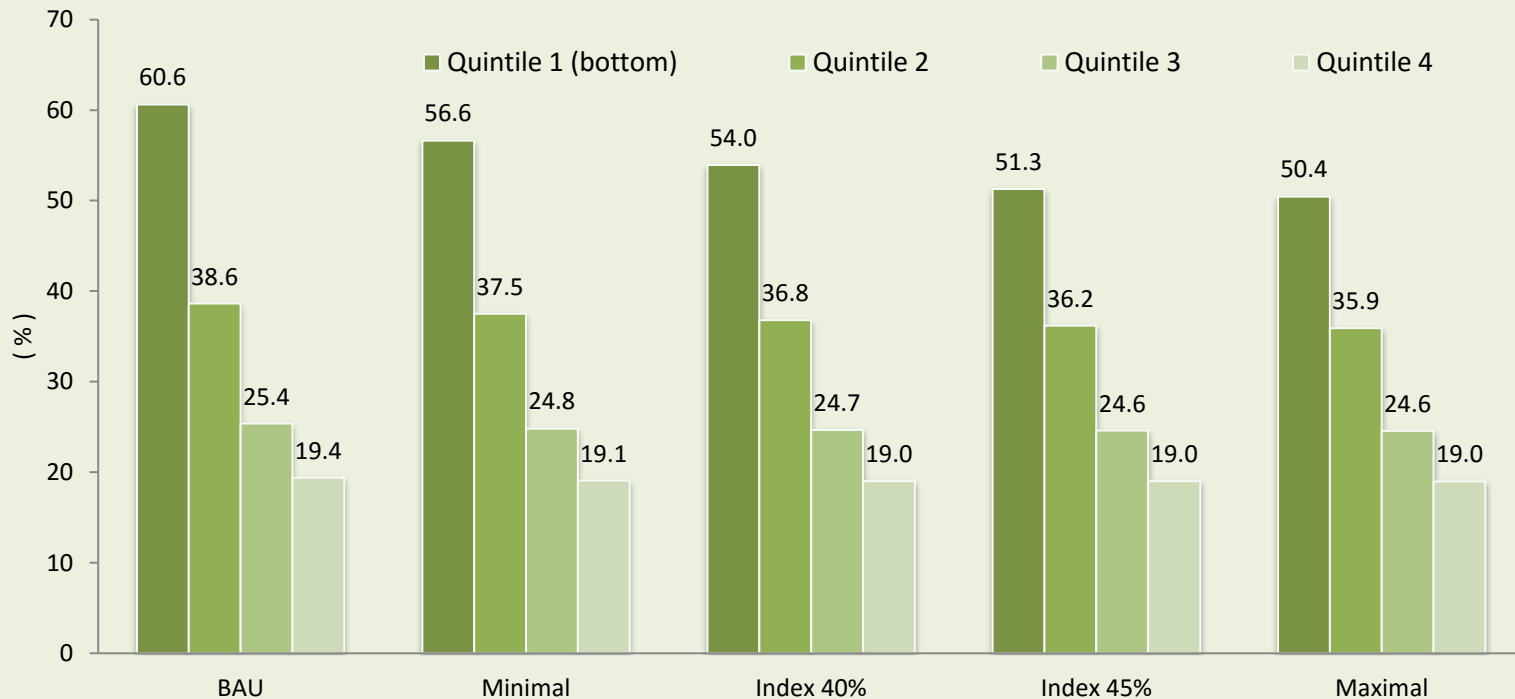
NMW and Poverty by Gender (2025)



Source: DIMMSIM, www.ADRS-Global.com

Key Finding: NMW reduces poverty rate among the bottom 80% of population, specially the bottom 20%

NMW and Poverty by Quintile (2025)



Source: DIMMSIM, www.ADRS-Global.com

X. CONCLUSIONS

Conclusions

- ❖ Overall, a NMW in South Africa is found to be a pro-poor measure that reduces poverty and inequality and improves economic growth.
- ❖ The suitable approach to measure the potential impact of the NMW takes account of dynamic interactions between expenditure, production and distribution.
- ❖ The introduction of the NMW and the subsequent wage adjustments of 48 percent and more full time workers across sectors of the economy help increase the average sector wage rates from below. This contrasts with historical trends of increases in sector average wage rates resulting from disproportionate increases in the remuneration of high skilled workers.
- ❖ Similarly, the contribution of a NMW to the increase in total household income mainly reflects its positive impact on the income of the working poor and not through an increase in income of high income earners. This distinction between the BAU scenario and the NMW scenarios has significant implications for the evolution of poverty and inequality over the next 10 years.

Conclusions

- ❖ The model results show that the introduction of a NMW will predominantly have positive impact on key macroeconomic and industry indicators.
- ❖ At the same time, the introduction of a NMW is projected to significantly reduce headcount poverty, specially among the bottom quintile, and to reduce income inequality.
- ❖ Its projected positive impact on households income and expenditure is also projected to reduce demand for social grants and increase government revenue from income and value added taxes
- ❖ The negative effects of introducing a meaningful NMW on some economic indicators do not threaten macroeconomic balance. They may therefore be considered acceptable trade offs for a policy with significant positive contributions to household real disposable income and economic growth.
- ❖ The projected positive contribution of a NMW to economic growth indicates that it can help the economy break away from the current vicious cycle of a low growth path

END