The need for a “complete” labor market in CGE modeling

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Introduction

- Important role of employment issues
- Existing models
- Characteristics of labor markets
- Why is a realistic labor market representation important?

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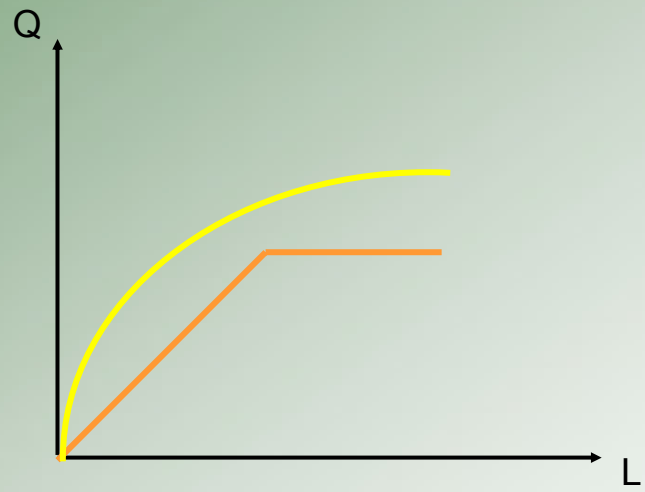
The Labor Market in CGE Modeling - General Characteristics

- Labor is an input of a neoclassical production function:

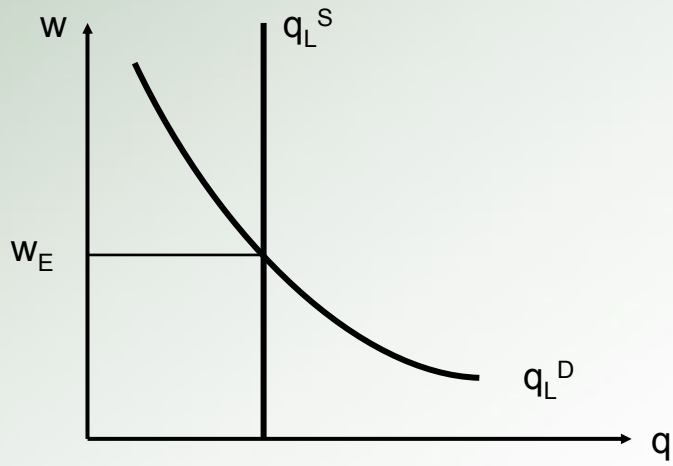
Leontief: $f(L) = \min\{ x_L/\alpha_L \}$

CES: $f(L) = A [\alpha K^{-\rho} + (1-\alpha)L^{-\rho}]^{-r/\rho}$

Cobb-Douglas: $f(L) = A K^{\alpha} L^{1-\alpha}$



- Labor supply is usually fixed exogenously and inelastic.
- Labor demand adjusts.



$q_L^D = q_L^S$

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Labor Market Extensions - Dualistic Labor Market

Regarding developing countries the labor market is often split up into a formal and informal sector.

Modifications:

- preference of workers
- workers' spill-over
- wage differential
- differing production structure
- special linkages

Labor Market Extensions - Labor Categories

The distinction between several labor categories is a frequently used kind of extension of the labor market.

Distinction by

- educational level:

  e.g. skilled/unskilled labor etc.

- sector:

  e.g. agriculture, manufactures etc.

Modifications:

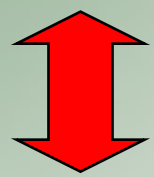
- wage differentials
- combination with the formal/informal approach

Labor Market Extensions - Wage Differential

This kind of a labor market extension assumes a wage differential among sectors. There exist two different approaches:

1st approach: Exogenous Wage Differential

- factor payment differential is identified as model variable



2nd approach: Endogenous Wage Differential

- based on the “efficiency wage theory”

Labor Market Extensions - Unemployment

Unemployment is a difficult issue in CGE modeling since this situation is not consistent with the equilibrium concept of the models.

1st approach:
Equilibrium Rate of Unemployment

In equilibrium a pool of unemployed workers is needed because of

- the problem of employee turnover,
- the problem of shirking.

2nd approach:
Unemployment - Vacancy Curve

- workers searching for jobs
- firms recruiting workers to fill vacancies

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Labor Market Policies - Minimum Wage

In the case of a minimum wage policy the government fixes a certain wage rate employers are not allowed to undercut.

Existing Approaches:

- minimum wage by occupation
- minimum wage by sector

Modifications:

- dualistic labor market
- minimum real wage

Labor Market Policies - Labor Union

Basically one can distinguish between two approaches to include the union behavior in the model framework.

1st approach:
Monopoly Union Model

- trade-off between wages and employment
- firm stays on its labor demand curve
- union objectives:
  - maximize worker's gain over certain unemployment benefit
  - maximize rents, wage bill
  - minimum wage + employment level

2nd approach:
Efficient Bargaining Model

- firm does not stay on its labor demand curve
- contract curve
- decisive factor: strength of firm and union

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Model and Simulations - GTAP

Global Trade Analysis Project Model

General Features:

- standard GTAP model
- database 5.0

Labor Market:

- fixed labor supply
- skilled/unskilled labor split-up
- labor is perfectly mobile across sectors
- demand is specified by sector

Model and Simulations - Model Design I

Regional Aggregation:

- **LOW-INCOME:**

Malawi, Mozambique, Tanzania, Zambia, Zimbabwe, Uganda

- **MIDDLE-INCOME:**

Botswana, Namibia, Republique of South Africa

- **HIGH-INCOME:**

EU-15

- **NAFTA:**

Canada, USA, Mexico

- **ROW:**

Rest of the World

Sectoral Aggregation:

- **agriculture:**

cereal grains nec, vegetables, fruits, nuts, crops nec, sugar, food products nec

- **manufacture:**

textiles, wearing apparel, leather products, wood products, paper products, publishing, metals nec, manufactures nec

- **services:**

public administration, defence, health, education, financial services nec, air transport, construction, electricity

- **primary:**

plant based fibres, wool, silk-worm cocoons, forestry, coal, oil, gas, minerals nec

- **rest**

Model and Simulations - Model Design II

Factor Aggregation:

- SkLab: Skilled Labor
- UnskLab: Unskilled Labor
- Capital: Capital
- Land: Land
- NatRes: Natural Resources

Model Extension:

- creation of a new variable, s_qo
- function of s_qo: calculation of percentage change in total labor demand in a region

Model and Simulations - Scenarios

Scenario I: Pure Trade Liberalization

50% cut of European import tariff on agricultural goods from low- and middle-income African countries

Scenario II

implementation of a minimum wage for unskilled labor

Scenario III

mobility of unskilled labor restricted to -0.6

Scenario IV

combination of minimum wage **and** change in unskilled labor mobility

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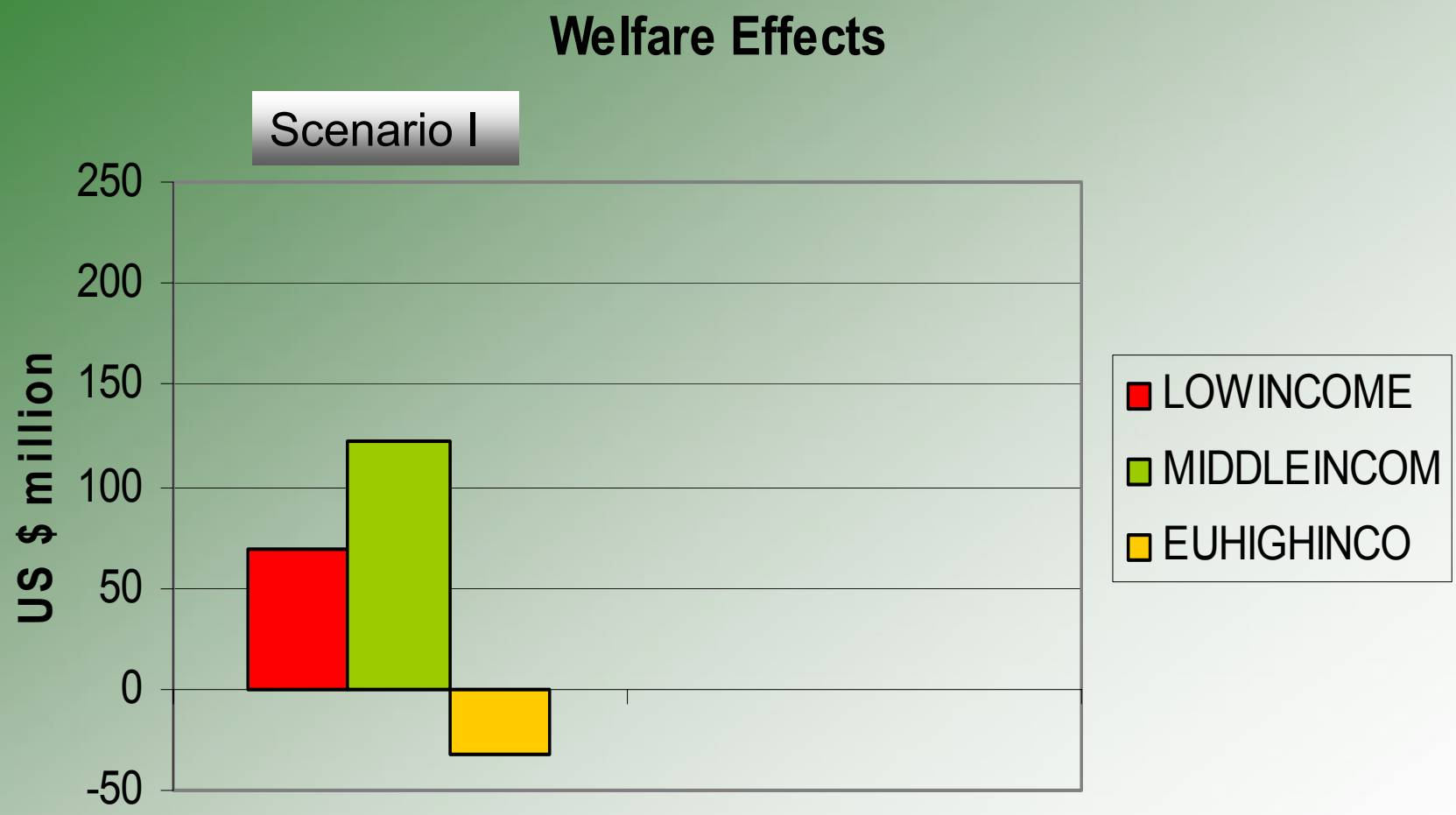
Simulation Results - Comparison of Scenarios



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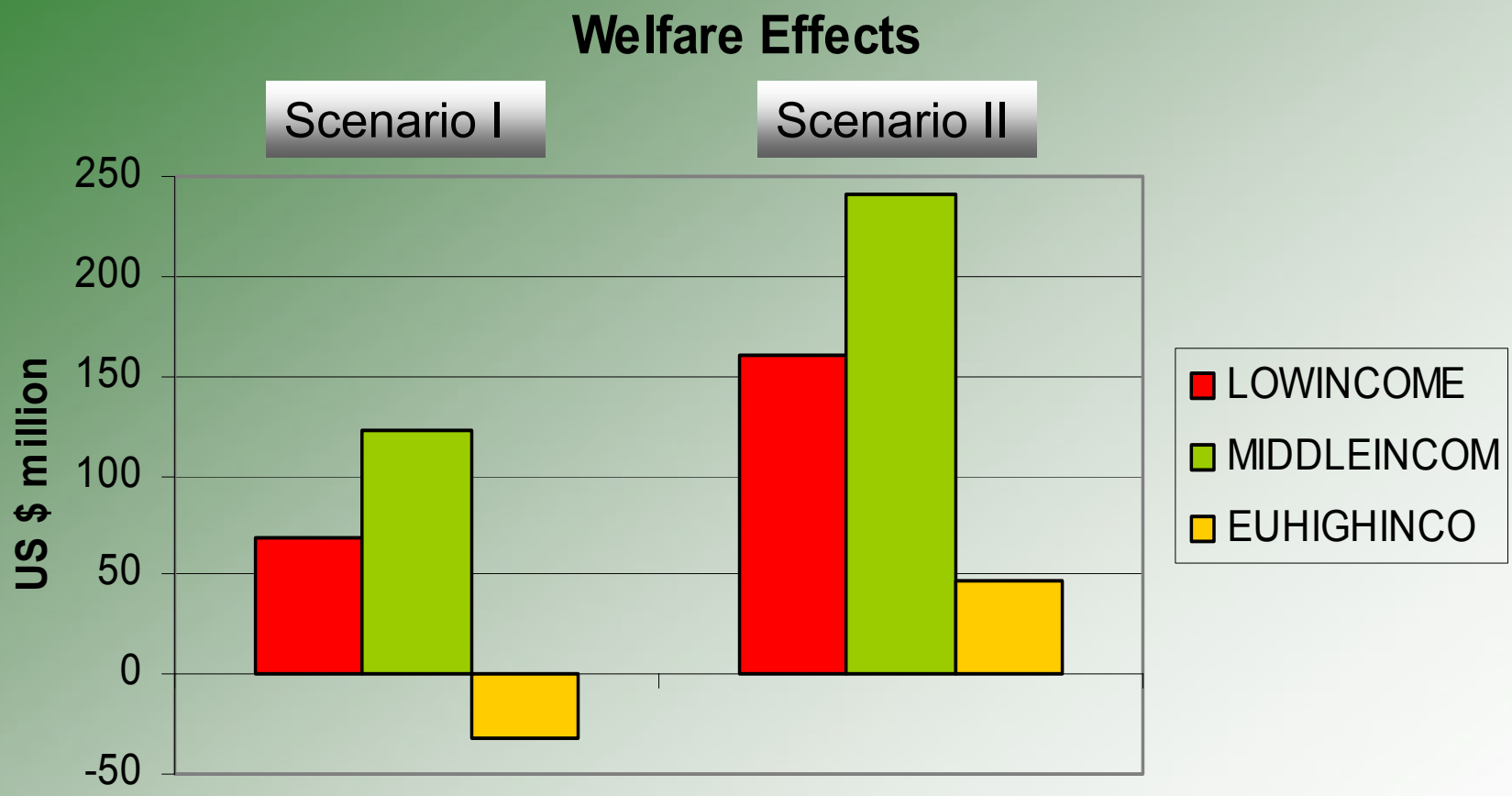
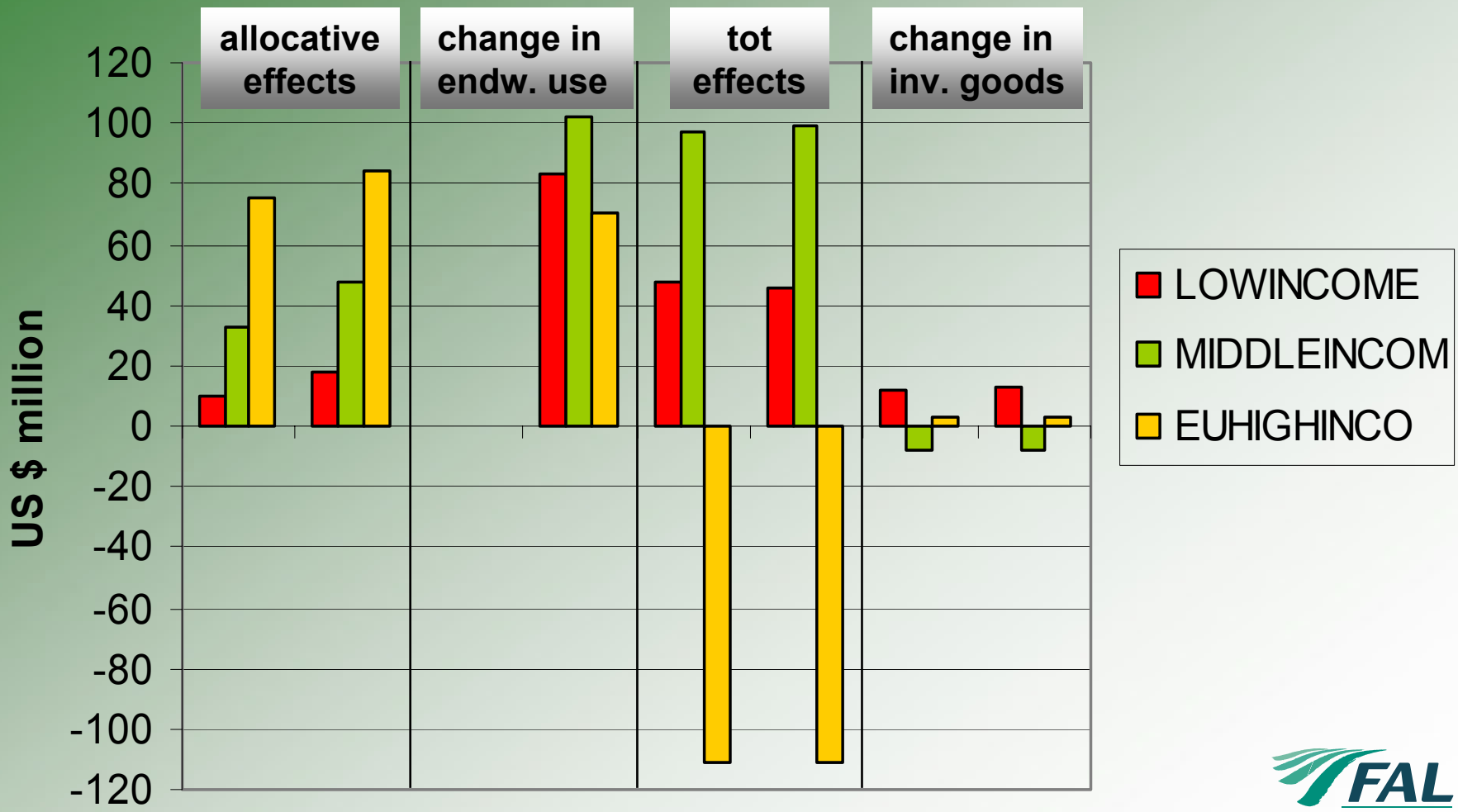


Simulation Results - Comparison of Scenarios

Scenario I - Scenario II



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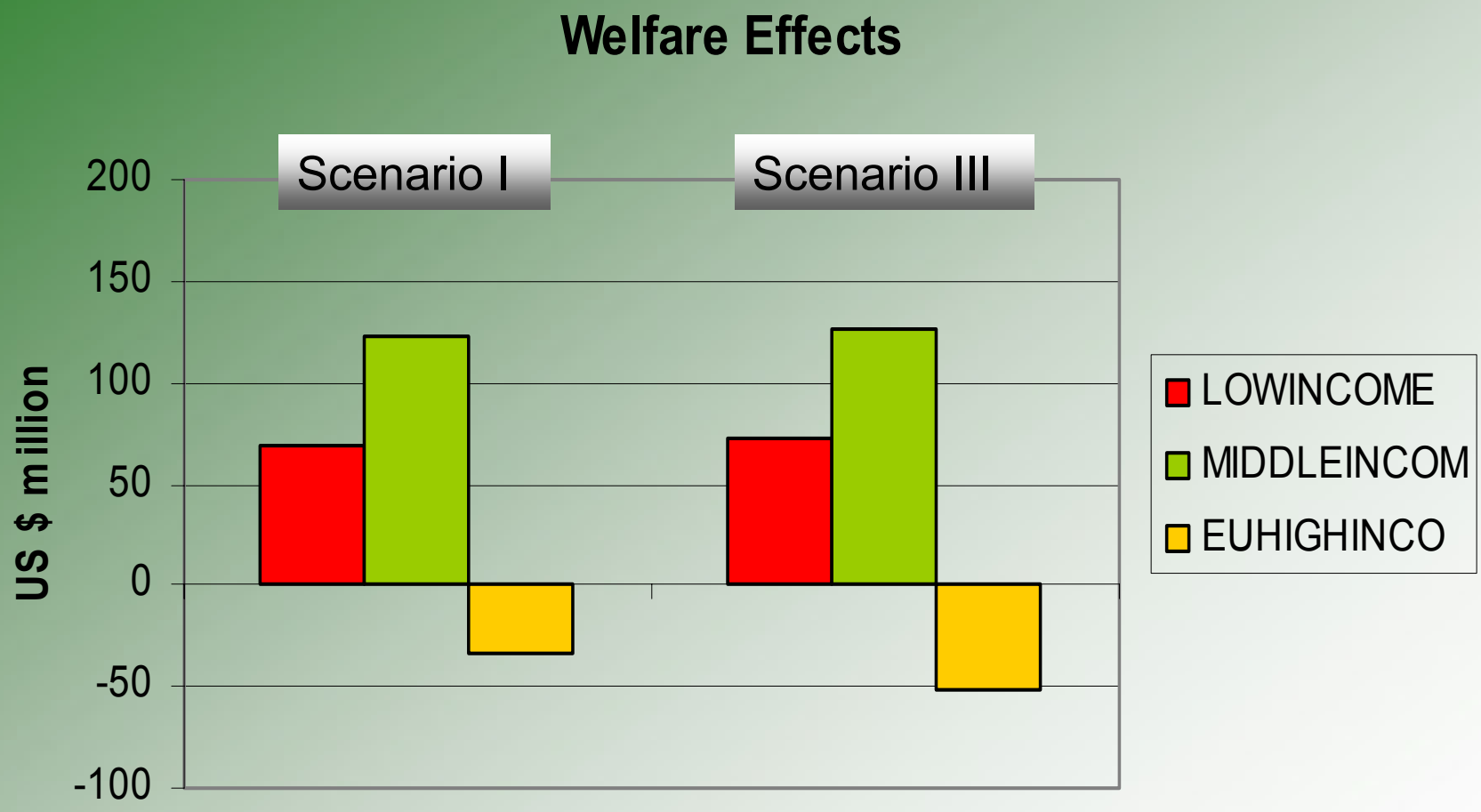

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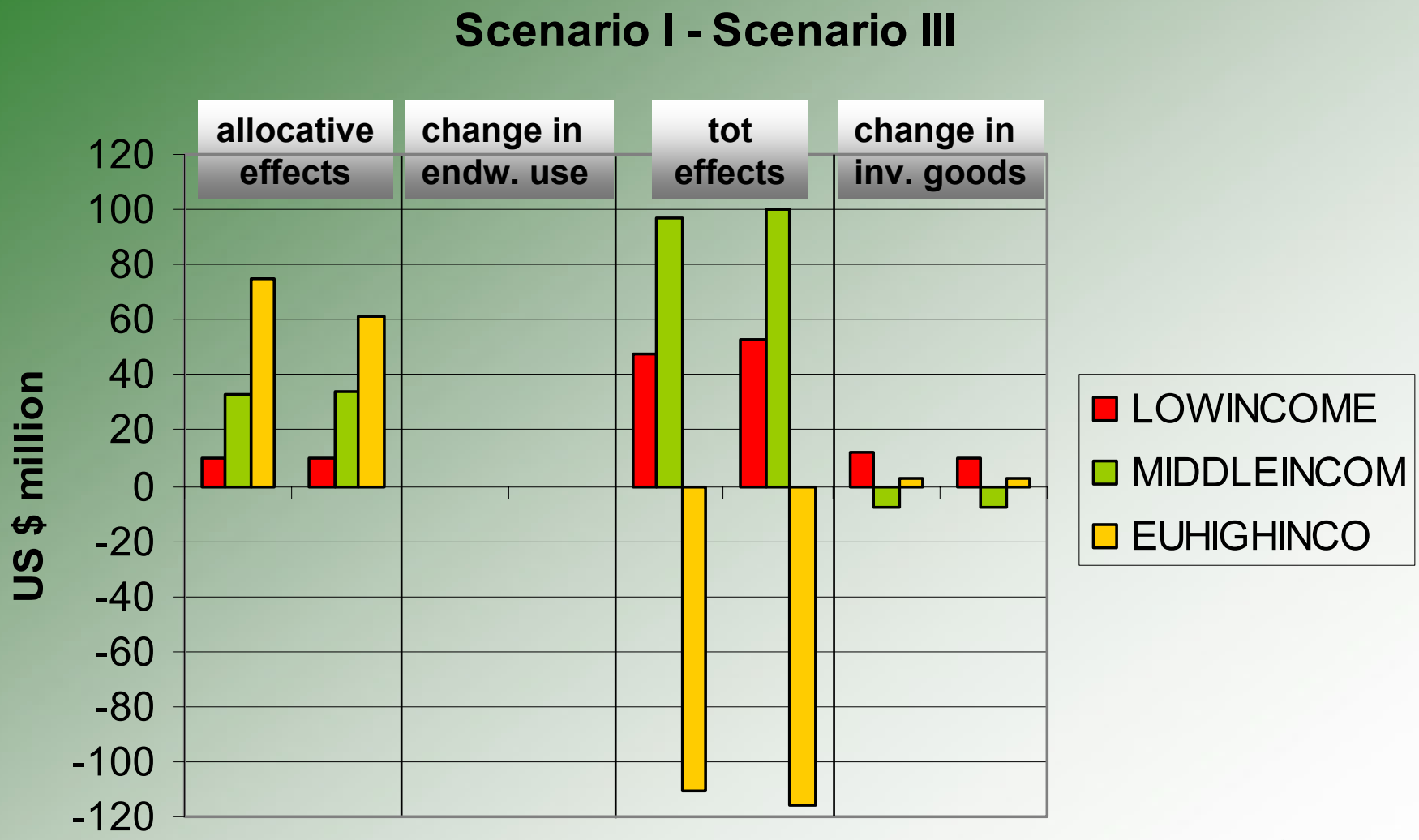

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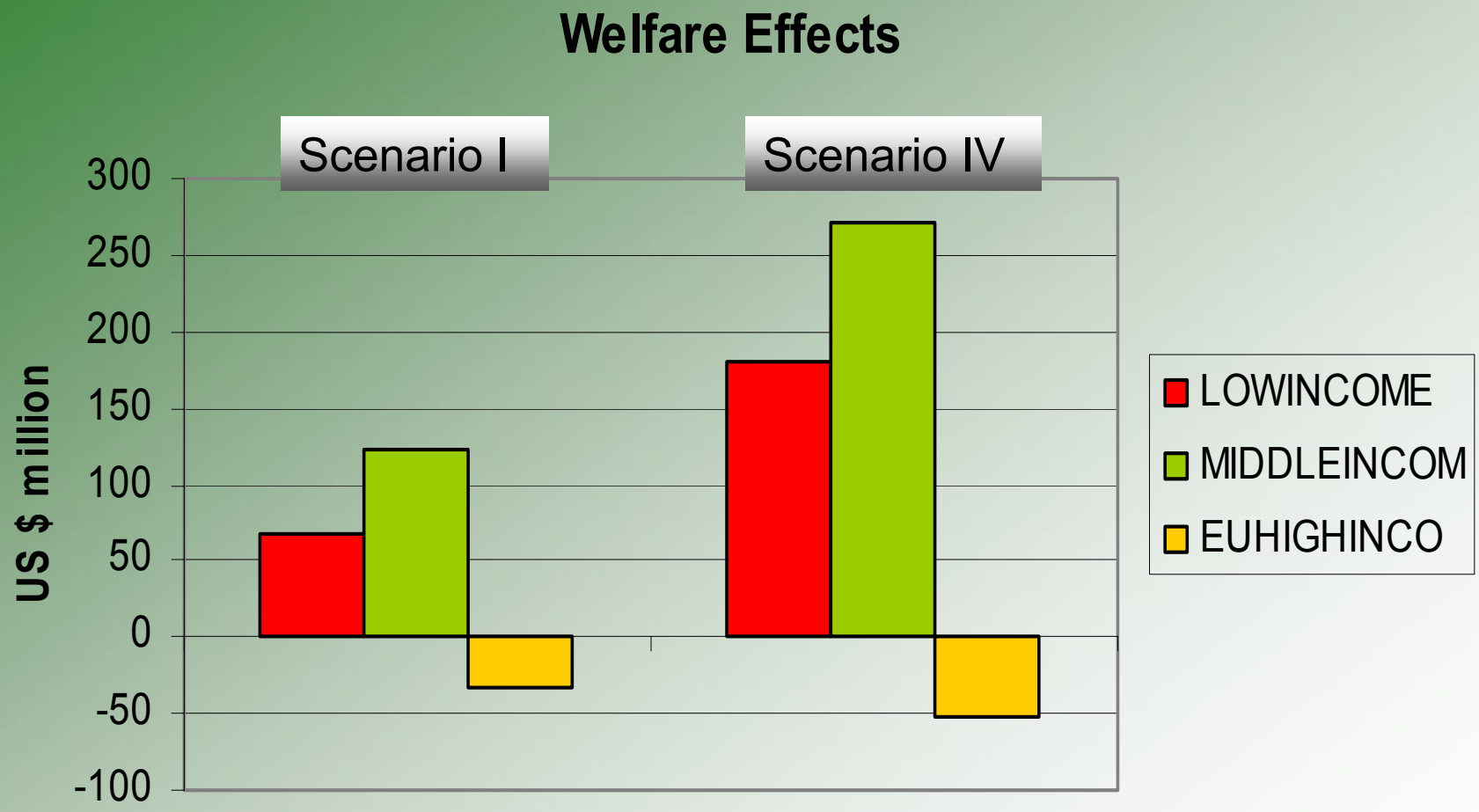

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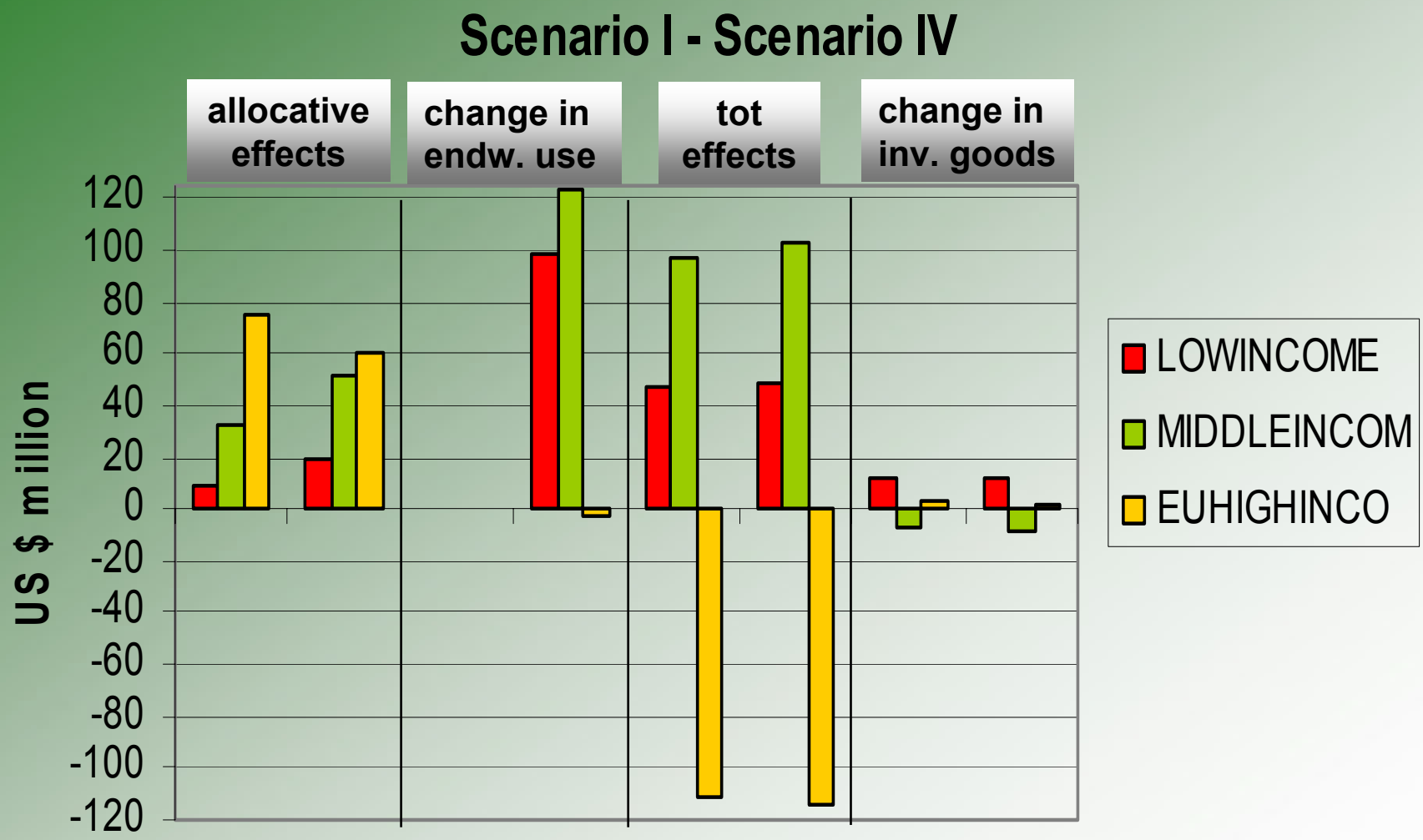

Conclusion and Qualifications

- labor market modifications influence outcome of trade scenario
- necessary for realistic prediction

Future Challenges:

- include more features
- interdependencies with agricultural market
- liberalizing agricultural and labor markets

The End.

Thank You.