Linking Poverty Outcomes to Economic Shocks and Policies

B. Essama-Nssah
Poverty Reduction Group
(PRMPR)
The World Bank
October 18, 2005
Module 3

Outline

1. Approach

2. Exogenous Shocks
   - The Dutch Disease
   - Changes in Terms of Trade

3. Budgetary Policy

Approach

- Shocks and policies may have at once macroeconomic, structural and distributional implications.
- A general equilibrium framework seems quite appropriate in accounting for interdependence among such policy issues.

Approach

- A general equilibrium analysis of the distributional implications of shocks and policies can proceed along 3 lines (at least):
  - Standard Representative Household (RH) approach.
  - The Extended Representative Household (ERH) approach.
  - CGE-Microsimulation approach.

Approach

- RH
  - Assesses impact of shocks and policies on mean welfare within a few representative socioeconomic groups.
  - This yields impact on functional distribution and between-group inequality, but not on poverty.

Approach

- ERH: Focus of this presentation
  - Extends the standard RH approach by modeling within-group size distribution (here we use the Lorenz model discussed earlier).
- CGE-Microsimulation
  - Unit record data from a household survey are used to represent the size distribution of welfare.

Approach

- Back to our ERH Approach:
  - Use the stylized Two-Sector CGE model studied in Module 2.
  - Generate random data from the beta distribution to construct size distribution for the rural and for the urban sector.

Approach

Size Distribution of Income within the Two Socioeconomic Groups

Group	Mean	Poorest Decile	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
National	1.00	0.01	0.03	0.04	0.06	0.07	0.09	0.11	0.14	0.18	0.28
Rural	0.66	0.02	0.03	0.05	0.07	0.08	0.10	0.12	0.14	0.17	0.21
Urban	1.50	0.00	0.04	0.06	0.07	0.09	0.10	0.12	0.14	0.16	0.23

Source: Author's calculations

Approach

Baseline Inequality

Focus	National	Rural	Urban
1	0.00	0.00	0.00
2	0.41	0.32	0.32
3	0.57	0.47	0.47
4	0.65	0.56	0.57
5	0.71	0.62	0.64
6	0.74	0.66	0.69

Source: Author's Calculations

Approach

Parameterization of the Lorenz Model

Parameter	National	Rural	Urban
β_1	1.52	2.16	1.46
β_2	-0.89	-1.42	-1.83
β_3	0.02	0.08	-0.15
e	-1.65	-1.82	-0.48
m	-5.29	-6.60	-2.51
n	2.86	4.84	2.37
r	8.11	10.50	2.82

Source: Author's calculations

Exogenous Shocks

Structural and Poverty Implications of Exogenous Shocks

	Base	Dutch	Deterioration TOT
Exports	30.0	78.63	94.50
Domestic Good	75.0	106.98	101.83
Final Imports	27.0	115.59	85.89
Intermediate Imports	3.0	79.19	94.67
Total Consumption	100.0	109.87	97.54
Rural Consumption	40.0	101.50	96.63
Urban consumption	60.0	115.48	98.15
Total Poverty Incidence	59.2	96.61	103.39
Rural Poverty Incidence	78.3	98.72	102.56
Urban Poverty Incidence	30.5	83.33	103.33
Overall Poverty Gap	29.7	96.67	103.33
Rural Poverty Gap	38.7	97.44	102.56
Urban Poverty Gap	16.3	87.50	106.25

Source: Author's calculations

Exogenous Shocks

- Dutch Disease
  - Refers to decline of the Netherlands' export competitiveness in the 1970s following discovery and exploitation of the Groningen natural gas fields (Benjamin, Devarajan and Weiner 1989).

Exogenous Shocks

- Dutch Disease
  - In general, the adverse effect that real exchange appreciation has on some tradable sectors of the economy as a result of an increase in foreign capital inflow.
  - Real appreciation of the exchange rate is an increase in domestic prices relative to world prices (Devarajan et al. 1990). Recall our choice of *numéraire* price (nominal exchange rate).

Exogenous Shocks

- Dutch Disease
  - implications of an increase of the balance of trade from 0 to 10.
    - Structural: production of exports falls by about 21 percent, while production of domestic good increases by about 7 percent. Why?

Exogenous Shocks

- Dutch Disease
  - Foreign capital inflows are distributed to households.
  - Increase in household income implies increase demand for both domestic good and imports (due to the assumption of imperfect substitutability).
  - Increase in demand for non-tradable (domestic good) induces an increase in its price relative to that of exports (real appreciation).

Exogenous Shocks

- Dutch Disease
  - Real appreciation of the exchange rate causes resources to move out of the export sector into the non-tradable sector to meet the increase demand for the domestic good.
  - The decline of the export sector also explains the observed decline in intermediate imports.

Exogenous Shocks

- Dutch Disease
  - Role of structural parameters
    - The magnitude of the elasticity of substitution underpins the extent of real appreciation (Devarajan et al. 1990):
      - (1) If zero, imports and domestic goods are perfect complements. More of both goods are consumed, and an increase in price of the domestic good leads to real appreciation.

Exogenous Shocks

- (2) If infinity, both goods are perfect substitutes. The demand for the domestic good will not change and therefore there will be no real appreciation and no Dutch disease.
- Other cases fall between these two extremes.

Exogenous Shocks

- Dutch Disease
  - Poverty Implications
    - Aggregate consumption increase by almost 10 percent. Underlying distributional mechanisms assign 80 percent of the transfer to urban households.
    - Urban consumption increases by about 15 percent while rural consumption increases only by 1.5 percent.

Exogenous Shocks

- Dutch Disease
  - Poverty Implications
    - Overall poverty incidence declines by about 3.4 percent.
    - Urban biased in redistribution of foreign transfers causes poverty incidence to fall by about 17 percent. Rural poverty falls only by 1.3 percent.

Exogenous Shocks

- Should Dutch disease be a matter of policy concern?
  - If underlying real appreciation is sudden or reversible, then policymakers may wish to mitigate its impact on tradable sectors (Corden 2002).
  - If fixed exchange rate with independent monetary policy (or in the regime of managed float) the government may try to sterilize the effects of foreign capital inflows on the money supply. Fiscal contraction can also help.

Exogenous Shocks

- Case of Cameroon during the oil boom of the 1970s (Benjamin, Devarajan and Weiner 1989):
  - Fixed exchange rate and no independent monetary policy.
  - Saved a large share of oil revenue abroad and use part of windfall to increase producer price of cash crop thus counteracting the adverse incentive effects induced by real appreciation.

Exogenous Shocks

- Deterioration of Terms of Trade
  - Key determinant of impact: interaction between the income and substitution effects induced by changes in TOT as governed by the degree of substitutability between home goods and imports (Devarajan, Lewis and Robinson 1990).

Exogenous Shocks

- Deterioration of Terms of Trade
  - An increase in world price of imports reduces households' real income(income effect) and renders home goods more attractive relative imports (substitution effect).

Exogenous Shocks

- Deterioration of Terms of Trade
  - If elasticity of substitution less than one, the income effect dominates. Increase in the price of imports implies reduction of demand for both home goods and imports. Hence, there would be real depreciation (fall in price of domestic goods)
  - Resources would shift out of the domestic sector to produce more exports to pay for the imports that have now become more expensive.

Exogenous Shocks

- Deterioration of Terms of Trade
  - In the case presented here, substitution effect dominates because the elasticity of substitution is greater than one.
  - Increase demand for domestic goods leads to a real appreciation of the exchange rate.
  - An increase in 10 percent in world price of imports leads to a cut of about 14.11 percent in final imports and 5.5 percent decrease in exports.

Exogenous Shocks

- Deterioration of Terms of Trade
  - Intermediate imports fall by 5.33 percent while the production of home goods increases by 1.83 percent.
  - This deterioration of the TOT causes consumption to fall both in the rural and the urban area. Poverty incidence increases by 2.6 percent in the rural area and 3.33 percent in the urban area.

Budgetary Policy

Efficiency and Poverty Implications of Budgetary Policy

	Base	Exp3	Exp2	Exp1	Reference	Exp4	Exp5	Exp6
Exports	30.0	106.3	104.3	102.2	100.0	97.7	95.3	92.8
Domestic Good	75.0	97.9	98.6	99.3	100.0	100.8	101.6	102.4
Final Imports	27.0	106.7	104.5	102.3	100.0	97.6	95.1	92.5
Intermediate Imports	3.0	103.0	102.1	101.1	100.0	98.8	97.4	96.1
Total Consumption	100.0	99.9	100.0	100.0	100.0	100.0	100.0	99.9
Rural Consumption	40.0	107.7	107.4	107.1	106.7	106.3	105.8	105.4
Urban consumption	60.0	94.8	95.0	95.3	95.6	95.8	96.1	96.3
Total Poverty Incidence	59.2	97.1	97.2	97.3	97.5	97.6	97.8	98.0
Rural Poverty Incidence	78.3	94.4	94.7	94.9	95.2	95.5	95.8	96.1
Urban Poverty Incidence	30.5	107.6	107.2	106.8	106.4	106.0	105.6	105.3
Overall Poverty Gap	29.7	95.3	95.4	95.6	95.8	96.1	96.3	96.6
Rural Poverty Gap	38.7	92.5	92.8	93.1	93.5	93.9	94.3	94.7
Urban Poverty Gap	16.3	104.9	104.7	104.4	104.1	103.9	103.6	103.4

Source: Author's

Budgetary Policy

- Baseline:
  - Domestic sales tax: 15.4 percent
  - All tariffs: 12.5 percent
  - Outcome: No structural change, hence optimal configuration
- Policy Experiments
  - Cases 1-3:
    - Set sales tax progressively at 5, 10 and 15 percent above reference value of 15.5 percent
    - Tariff on final imports (10.3, 8.2, 6.2).
    - Tariff on intermediate imports (18.3, 24.2,30.5)

Budgetary Policy

- Policy Experiments
  - Cases 4-6:
    - Sales tax (5,10, 15) percent below reference
    - Tariff on final imports (14.8, 17.3, 20)
    - Tariff on intermediate imports (7, 1.6, -3.6)

Budgetary Policy

- Outcome Baseline
  - An optimal configuration of tax instruments to the extent that it does not distort private sector decisions (there is no change relative to the no government case).
  - Redistributive policy causes overall poverty incidence to decline by about2.5 percent (a 5 percent decrease in rural poverty vs an increase of more than 6 percent in the urban sector).

Budgetary Policy

- Outcome second block of experiments
  - Production of exports increases while that of domestic good declines.
  - Imports increase
  - Pattern of poverty is similar to the reference case, but rural poverty a bit higher than in base case, so is the increase in urban poverty.

Budgetary Policy

- Outcome third block of experiments
  - In all cases production of exports and all imports fall.
  - Poverty reduction in the rural area is now less than in the base case, similarly for the increase in urban poverty.

Budgetary Policy

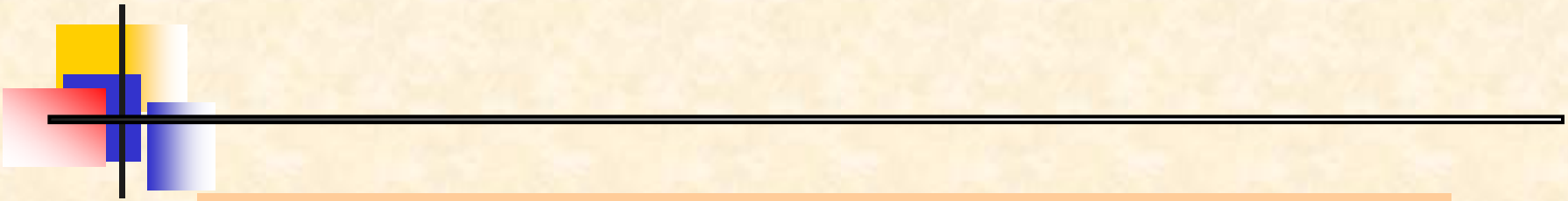
- Upshot
  - For all experiments, the aggregate welfare effects as measured by changes in total consumption are negligible.
  - However, structural and distributional impacts are significant. What policy actually gets implemented depends on these effects.

References

- Benjamin Nancy C., Devarajan Shantayanan and Weiner Robert J. 1989. The "Dutch" Disease in a Developing Country : Oil reserves in Cameroon. Journal of Development Economics. Vol. 30: 71 - 92.
- Corden W. Max. 2002. Too Sensational: On the Choice of Exchange Rate Regimes. Cambridge (Massachusetts): The MIT Press.
- de Melo Jaime and Robinson Sherman. 1989. Product Differentiation and the Treatment of Foreign Trade in Computable General Equilibrium Models of Small Economies. Journal of International Economics, Vol. 27:47-67.

References

- Devarajan, Shantayanan, Jeffrey D. Lewis, and Sherman Robinson. 1990. Policy Lessons from Two-sector Models. Journal of Policy Modeling 12 (4): 625-657.



The End.