Short introduction to the Ghanaian Microsimulation Model (GHAMOD)

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GHAMOD – the Ghanaian Model

• User-friendly Standalone user interface: stable, great control and guidance over user actions, increased functionality

• Model workings are transparent, and the user has full control over the simulations carried out

• The current version (v1.0) of GHAMOD is underpinned by the 2012/13 Ghana Living Standards Survey Round 6 (GLSS 6)

• Can be easily updated with new data and policy reforms when required
GHAMOD data

- The first step in microsimulation is to collect data on the incomes and expenditures of individuals in a representative survey of households.

- Current version of GHAMOD is underpinned by Ghana Living Standards Survey Round 6 2012/13 (GLSS 6) data.

- This represents the characteristics of the Ghanaian population in 2012/13.

- The dataset after cleaning contains information on 71,321 individuals in 16,677 households.

- Nationally representative.
GHAMOD policies (i)

• The second step is to have a series of policy rules which can be applied to the individuals in the data to determine what social grants they are entitled to and what taxes they should pay.

• To simulate a policy we must be able to:
  
  – translate the rules into the “language” of the software (simple code)
  
  – collect the information needed to apply the rules (more difficult due to data constraints)
  
  – Policy rules for the years 2013 to 2016 have been incorporated into GHAMOD V1.0
GHAMOD policies (ii)

The policies that are currently simulated in GHAMOD are:

Social grants and social insurance
- Livelihood Empowerment Against Poverty (LEAP)
- School Capitation Grant
- Employee/Employer Social Security Contributions

Direct and indirect taxes
- Income tax
- VAT
- Excise taxes
GHAMOD – what does it not do?

- Some existing policies are not simulated (mostly due to data restrictions), e.g. public and private pensions
- No changes in behaviour simulated, e.g. people working less due to higher taxes
- No macro-economic effects are considered—only direct impact on households (micro level) considered
- However, the output from the model can be used as the starting point for more complex analyses involving behavioural change and micro-macro linkages

  ➢ Work in progress: research paper analysing how formal sector work reacts to tax increases due to social protection expansion - combines microsimulation with estimate of behavioural response
A simulation example
Simulating an old-age pension using GHAMOD

Simulate the impacts of an old-age pension reform in Ghana:

• given to all person above 65 years of age with no existing pension receipts

• Amounts the same as in the LEAP cash transfer scheme (32 Cedis a month for a single recipient, more if more than one eligible in the household) in 2013, i.e. year of GLSS 6
### Policies

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<td>TAX: Employer social contributions</td>
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<td>TAX: Employee social contributions</td>
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Introducing a "new" pension policy to GHAMOD

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<td>$poa2</td>
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<td>TAX_UNIT</td>
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</table>

Individual level not household
Results of the old-age pension simulation

Examine poverty, inequality and government costs and revenues in scenario with old age pension in 2013:

➢ Poverty lower by approximately 3 percentage points among households with older persons

➢ Would have increased government expenditure by 437 million Cedi in 2013 (approximately 700 million Cedi in present terms)
GHAMOD resources

- GHAMOD Country Report
  - Documents how underlying data were modified and how policies are modelled
  - model results are compared with external data (macro validation)

- Data requirement document (DRD)
  - Explains all variables used in the model
  - Available upon request (detailed excel)
GHAMOD training course

• From this afternoon until Friday afternoon

• Aims:
  – Explain GHAMOD underlying data and coding of policies
  – Explain the software used by GHAMOD
  – Participants learn how to
    • Amend existing policy
    • Introduce a new policy
    • Examine the implications of adopting a policy that is being used elsewhere (e.g. a child grant)

• After the course: participants can start using the model
Obtaining GHAMOD

• Users will need to sign a **licence** that gives access to EUROMOD software, GHAMOD policy modelling and the underpinning data

• The licence is **free of charge**

• Users need to acknowledge use of model and data (GLSS 6) citing WIDER and Ghana Statistical Services

• Underlying **GLSS6** with suitable amendments that the model requires

• Research papers submitted to WIDER for consideration as WIDER Working Papers
Conclusion

• The model will be kept **up to date**
  – Updating of policies
  – When new data become available, the model will be amended so that it can also work on the basis of them

• **More research projects** using GHAMOD and other SOUTHMOD country models to come

• We encourage interested people to join the **microsimulation users group**

• Suggestions for **improvements** and **ideas** for simulations are highly welcome!
Happy simulations!!!