Construction of Income Concepts and Components

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Income Concepts

- **Market Income**
  - Contributory Pensions
  - Direct Transfers
  - Non-Taxable Income

- **Gross Income**
  - Direct Taxes
  - Taxable Income

- **Net Market Income**
  - Direct Taxes

- **Disposable Income**
  - Indirect Subsidies

- **Consumable Income**
  - In-Kind Transfers (Education, Health)

- **Final Income**
  - Copayments, User Fees
Income Concepts

- Market Income
  - Contributory Pensions
  - Market Income plus Pensions
    - Direct Transfers
    - Non-Taxable Income
    - Taxable Income
  - Gross Income
    - Direct Transfers
    - Direct Taxes
  - Disposable Income
    - Indirect Subsidies
    - Indirect Taxes
  - Consumable Income
    - In-Kind Transfers (Education, Health)
    - Copayments, User Fees
  - Final Income
Market Income

- Wage and salary income
- Fringe benefits
  - Bonus pay
  - Employer contributions to health insurance
- Self-employment income (farm and non-farm)
- Retirement income
- Capital income
  - Interest
  - Dividends
  - Rent
- Private transfers
  - Child support
  - Alimony
  - Remittances
  - Private contributory pensions
- Imputed rent for owner-occupied housing
- Value of own production
Imputed Rent for Owner-Occupied Housing

• Direct identification
  – e.g., Brazil
  – "How much would this house be rented for if it were rented?"

• Prediction
  – e.g., Bolivia
  – Take households that rent and use the question asking how much they pay in rent
  – Predict rental rates based on characteristics (number of rooms; access to electricity, sanitation, piped water; geographic location; household income; etc.)
  – Use coefficients from this regression in an out-of-sample prediction to predict rental value of owner occupied housing
  – See Appendix C of the CEQ Handbook
Imputed Rent for Owner-Occupied Housing

• Alternate Survey (with Prediction)
  – e.g., United States
  – No question on how much paid in rent
  – Predict using alternate housing survey with this question

• Secondary Source (National Accounts)
  – e.g., Armenia
  – Use a secondary source estimate of average imputed rent as a proportion of income and inflate market income by that amount
  – National Income Accounts have imputed rent for owner-occupied housing, and it is 2.74% of household expenditure
  – Imputed rent = expenditure (equivalent to disposable income) * 2.74% for households that own their dwelling
Value of Own Production

• Direct Identification (for each item consumed)
  – e.g., Brazil
  – For each item purchased, ask how obtained
  – If own production or taken from own business inventory, value is still asked; use this value

• Direct Identification (one question only)
  – Some surveys ask one question about the total value of own production
  – Use this value in market income
Income Concepts

Market Income

- Contributory Pensions

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Market Income plus Pensions

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- Taxable Income

- Direct Transfers

- Direct Taxes

Net Market Income

- Disposable Income

- Direct Transfers

- Direct Taxes

Consumable Income

- Indirect Subsidies

- Indirect Taxes

Final Income

- In-Kind Transfers (Education, Health)

- Copayments, User Fees
Contributory Pensions

• Only includes pensions from the public contributory system
  – Non-contributory pensions are included in direct transfers
  – Private contributory pensions are included in market income

• Direct identification
  – Some surveys ask one question about the total value of own production
  – Use this value in market income

• Inference
  – e.g., Argentina
  – One question about pensions; use amount to infer whether it was a contributory or non-contributory pension since the latter was a specified amount
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        - Direct Transfers
          - Direct Taxes
            - Net Market Income
              - Direct Transfers
                - Direct Taxes
                  - Disposable Income
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                      - Indirect Taxes
                        - Consumable Income
                          - In-Kind Transfers (Education, Health)
                            - Copayments, User Fees
                              - Final Income
Market Income plus Pensions

- Market Income plus Pensions = Market Income + Contributory Pensions

\[ m + P = m + P \]
Income Concepts

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        - **Taxable Income**
          - Direct Transfers
            - Gross Income
              - Direct Taxes
                - **Disposable Income**
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                          - Copayments, User Fees
Direct Transfers: Components

• Cash Transfer Programs
  – Conditional and Unconditional

• Non-Contributory Pensions

• Scholarships

• Public Works Programs
  – Also known as "Pay for Work" and "Welfare to Work" programs
  – Include full wage and do not attempt to subtract opportunity
cost of individual's time

• Food transfers
  – Considered direct transfers because have well-defined market
value, are close substitutes for cash

• Refundable Tax Credits
  – Pay cash to low-income families with no tax liability
  – Function as a transfer
Direct Transfers: Allocation

- Direct Identification
  - Many examples from all countries

- Inference
  - Non-Contributory Pensions in Argentina
    - All pensions grouped together; infer whether non-contributory or contributory based on amount and program rules for non-contributory pensions
  - Milk Transfers in Brazil
    - For families that live in eligible region, assume that if they reported the milk they consumed as having been donated, it was from the government
  - Public Scholarships in United States
    - All scholarships grouped together; infer whether Pell grant (government scholarship for low-income) based on amount and program rules
Direct Transfers: Allocation

• Simulation
  – Targeted Transfers in Argentina and Bolivia
    ▪ Simulated according to program rules and eligibility criteria (based on income, having children, etc.)
    ▪ Assumed perfect targeting, full coverage and take-up of target population, and no leakages
  – Refundable Tax Credits in US
    ▪ Simulated according to program rules and eligibility criteria (based on income, having children, etc.)
    ▪ Adjusted for imperfect take-up by attributing no benefit to households in which no members reported filing a tax return
Direct Transfers: Allocation

• Imputation
  – Food aid in Ethiopia
    ▪ Whether a household receives food aid is reported in survey, but not amount received
    ▪ Total government spending on food aid distributed equally across households that report receiving aid
  – School lunches, uniforms, and textbooks in Ecuador
    ▪ Whether a child receives free school lunches, uniform, and textbooks is reported in the survey
    ▪ Value imputed by distributing total spending from national accounts to households that receive these benefits
  – School uniforms and textbooks in Sri Lanka
    ▪ Same method as in Ecuador
  – Note: scale down totals from national accounts
Direct Transfers: Allocation

• Alternate Survey (with Direct Identification)
  – Conditional Cash Transfer in Indonesia
    ▪ Included in a 2013 survey but not the 2012 survey used in the analysis
    ▪ Compute distribution of benefits by region and expenditure decile in 2013 survey
    ▪ Distribute benefits in 2012 survey among eligible households within each region-decile pair
Underestimation of Beneficiaries

• Combines Direct Identification with Imputation
• In most surveys, number of recipients of direct transfers underestimated
  – Compared to national accounts
  – e.g., Bolsa Família in Brazil
    ▪ 7.3 million beneficiaries according to survey
    ▪ 12.4 million beneficiaries according to Ministry of Social Development
  – Even a large problem in developed country surveys
• Solution
  – Assume some beneficiaries erroneously did not report receiving benefit
  – Assume they are similar to beneficiaries that did report receiving benefits
  – Impute benefits to households that did not report benefit but similar to those that did
Underestimation of Beneficiaries

• Let
  – \( N \) = number of recipients according to national accounts
  – \( S \) = number of recipients according to survey
  – \( H = N - S \) = number of recipients we will impute benefits to
• Requirement: \( H < S < N \)
• Estimate propensity score for program participation
  – Probit of program participation dummy on
    ▪ household income
    ▪ possession of various household assets, consumer durables
    ▪ number of children
    ▪ race of household head
    ▪ region or state
    ▪ rural or urban area
    ▪ etc.
• Randomly sample \( H \) of the \( S \) beneficiary households
• Match them to non-beneficiary households with closest propensity score
Caveat: probit has to converge for method to work
  – In other words, covariates predict program participation
  – Works well for targeted transfer programs
  – Unlikely to work for non-targeted programs
Whether to make this adjustment is country team's decision
Depends on
  – size of discrepancy
  – local knowledge about which is closer to truth: survey or national accounts
Ideally, run results both ways
Income Concepts

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- **Market Income plus Pensions**
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- **Disposable Income**
- **Indirect Subsidies**
- **Consumable Income**
- **Indirect Taxes**
- **In-Kind Transfers (Education, Health)**
- **Copayments, User Fees**
- **Final Income**
• Gross Income = Market Income plus Pensions + Direct Transfers

\[ g = m_\uparrow + P + B_\downarrow d \]
Income Concepts

Market Income

Contributory Pensions

Market Income plus Pensions

Direct Transfers

Gross Income

Direct Taxes

Net Market Income

Direct Transfers

Disposable Income

Indirect Subsidies

Consumable Income

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Final Income

Non-Taxable Income

Taxable Income

Direct Taxes

In-Kind Transfers (Education, Health)

Copayments, User Fees
Direct Taxes: Components

- Individual income taxes
- Agricultural income tax (e.g., Ethiopia)
- Payroll taxes
  - Paid by both employee and employer
- Contributions to social security
- Property taxes
- Corporate income taxes
  - Included if possible

- Assumption: direct taxes fully shifted forward to labor in the form of lower wages
Grossing Up

Case in which reported income in the survey is **gross** of taxes. Suppose that:

- Reported income (gross of employee-paid income taxes) in the survey is 10
- Individual income taxes (reported or simulated) are 2
- Employer pays 3 in payroll taxes
- The income gross of taxes of 10 is already **net** of the employer-paid taxes, so we gross up income from this job to 10+3 = 13
  - 13 is the grossed up income use when we construct market income
- Direct taxes (ignoring for illustration other components like property taxes) are 2+3 = 5
- Income net of direct taxes is 13-5 = 8
Grossing Up

Case in which reported income in the survey is net of taxes (if not specified, normally we assume net). Suppose:

• Income reported in the survey, which is net of employee-paid income taxes, is 10
• Direct taxes are 2
• The employer pays 3 in payroll taxes
• The income of 10 is already net of taxes paid by both the employee and employer, so we gross it up to 10+2+3 = 15
  — 15 is the grossed up income we use when constructing market income
• Direct taxes (ignoring for illustration other components like property taxes) are 2+3 = 5
• Income net of direct taxes is 15-5 = 10
Direct Taxes: Allocation

• Direct Identification
  – Individual income taxes in Brazil, Colombia, Peru
    ▪ Brazil: for each income source, next question is how much was paid in direct taxes for that income source
  – Property taxes in Brazil (expenditure module of survey)

• Imputation
  – Agricultural income tax in Ethiopia
    ▪ Distribute total collected from national accounts proportionally to land holdings
Direct Taxes: Allocation

• Simulation
  – Individual income taxes in many countries
    ▪ Simulated according to reported incomes, household characteristics, and tax code
    ▪ Account for evasion by only simulating for those working in the formal sector
    ▪ In case of US (large formal sector), only simulate for those reporting filing a tax return
  – Payroll taxes paid by employer in Brazil
  – Corporate income taxes in Brazil and US
    ▪ Requires very broad assumptions about burden of corporate income tax
Direct Taxes: Components

• Alternate Survey (with Direct Identification)
  – Property taxes in US
    ▪ Property taxes paid reported in alternate survey
    ▪ Use common covariates of dwelling and household characteristics to match households between the two surveys
    ▪ Use property taxes paid of matched household

• Secondary Source
  – Individual income taxes in Mexico
    ▪ Distribution of income taxes by decile obtained from Ministry of Finance and allocated by decile in survey data
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  - Direct Transfers
Net Market Income

- Net Market Income = Market Income plus Pensions – Direct Taxes

\[ n = m^\uparrow + P - T^\downarrow d \]
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Market Income plus Pensions

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Taxable Income

Direct Transfers

Gross Income

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Indirect Taxes

In-Kind Transfers (Education, Health)

Final Income

Copayments, User Fees
Disposable Income

- Disposable income
  = Net Market Income + Direct Transfers

\[ d = n + B\downarrow d \]

= Gross Income - Direct Taxes

\[ d = g - T\downarrow d \]
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