

Income in EU-SILC – Net/Gross Conversion Techniques for Building and Using EU-SILC Databases

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Objectives:

- ❑ Discuss different approaches to modeling the process of conversion from net to gross of different components of income using EU_SILC Datasets.
- ❑ Present the main problems of the net to gross conversion using the Portuguese survey and discuss what is the best approach to deal with them.
 - The key question implicit in this discussion is the need of creating a set of EU-SILC Income target variables standardized for different countries.
 - Two main approaches: using different models specific to each country; using an integrated model.

Motivation:

- ❑ My previous experience in modeling the conversion of incomes from net to gross in the construction of the Portuguese dataset of Euromod.
- ❑ My present work in the Portuguese Statistical Office in building EU-SILC income variables using different net to gross and gross to net techniques.
- ❑ The new approach developed by Vijay Verna with the Siena Model and the very encouraging results he obtain for France, Italy and Spain

Main features of the Portuguese Tax-system:

- ❑ Regular income from employment, self-employment, pensions and property income are pooled together and taxed at tax-unit level;**
- ❑ Employment income and pensions are subject to retention at source of insurance contributions and/or tax;**
- ❑ The withholding tax that are based on individual income but the applicable tax take into account the tax payer marital status, the number of children, and if the partner also have income from the same source;**
- ❑ Income from self-employment is subject to withholding tax at flat rate;**

Main features of the Portuguese Tax-system:

- ❑ Employment income is subject to Social Insurance Contributions at a fixed rate;**
- ❑ Self-employment income social contributions depend of the amount of the income from self-employment and from employment;**
- ❑ The composition of the tax-unit could depend (marginally) of gross incomes. It includes dependent children and/or dependent parents;**
- ❑ Capital Income is subject to an individual withholding tax at flat rate and it's not taken into account at tax-unit level;**

EU-SILC Income components and the Portuguese Tax-system

Tax-unit level

1 - Employee income	PY010	Net to Gross Model
2 - Self-employment income	PY050	
3 - Pensions	PY100 / ... / PY130 / PY080	
4 - Property Income	HY040	

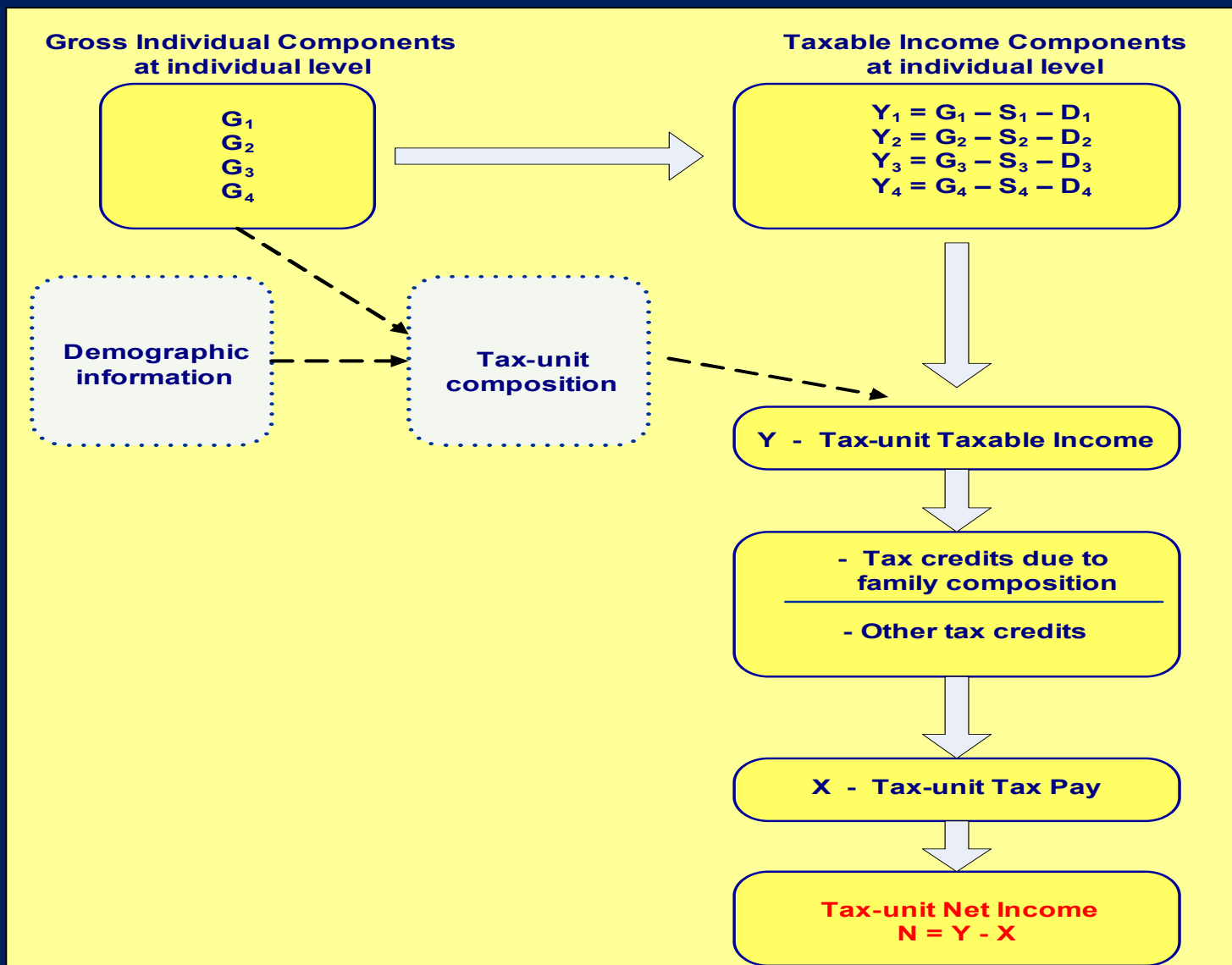
Flat rate taxed withholding at individual level

5 – Capital Income	HY090	N/G
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Tax exempt

6 - Unemployment benefits	PY090	N=G
7 - Education related benefits	HY050/PY140	
8 - Housing benefits	HY070	
9 - Social assistance	HY060	
10 - Private transfers	HY080/ HY130	
11 – Inc. received from children	HY110	

Gross to Net Model



Social Insurance Contributions

$$S_1 = S_1 (G_1) = 0.11 G_1$$

$$S_2 = S_2 (G_2, G_1, G_3, MW) = \alpha \lambda MW$$

with $\alpha = 0$ if $G_2 < 6 MW$ or $G_1 > MW$ or $G_3 > 0$

$\alpha = 0.254$ in all other situations

$$\lambda = 1, 2, \dots, 10$$

$$S_3 = 0$$

$$S_4 = 0$$

Deductions

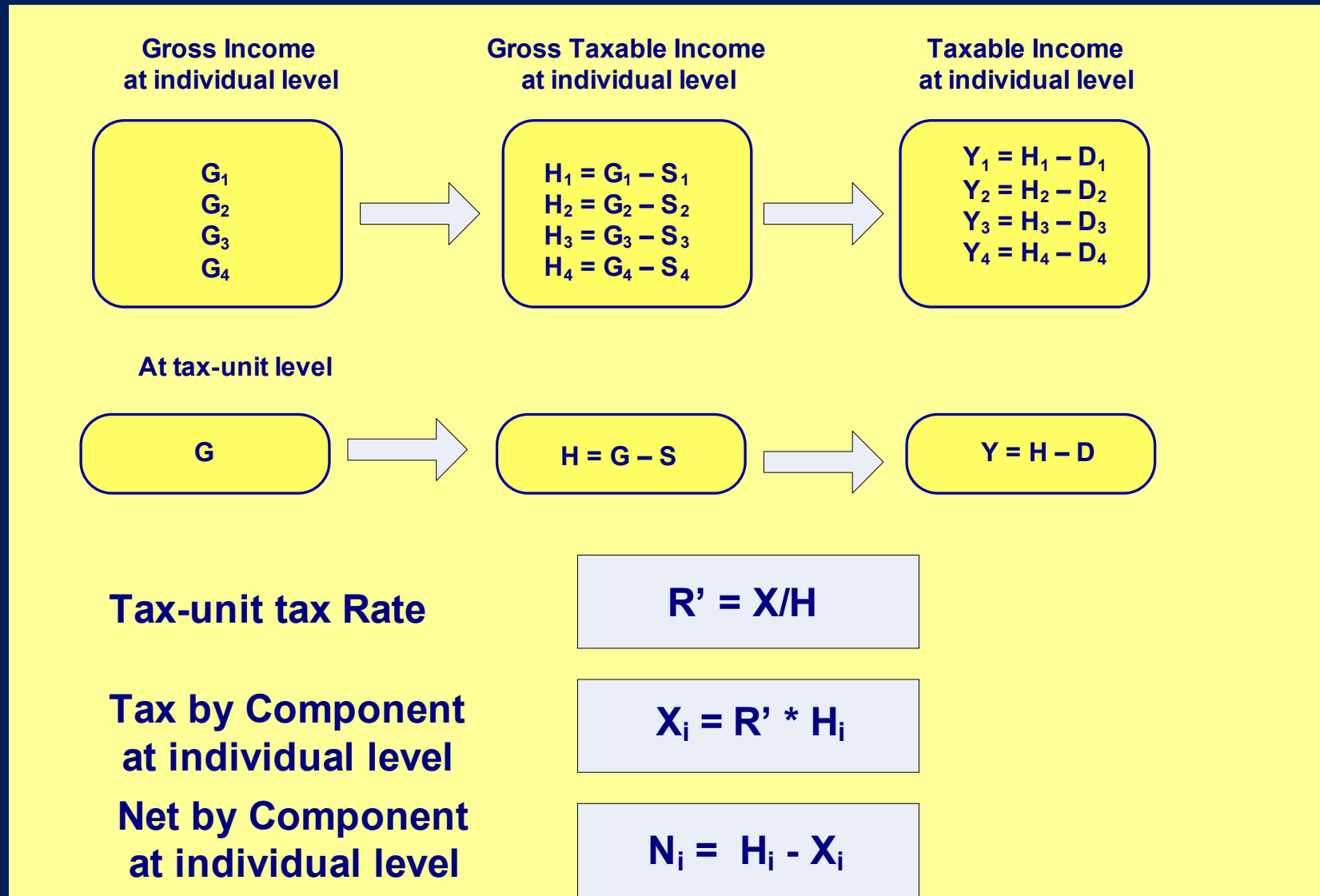
$$\begin{aligned} D_1 &= D_1 (G_1; S_1 (G_1); MW) \\ &= \text{Max} (S_1 ; [\min (0.72 G_1 ; 0.72 MW)]) \end{aligned}$$

$$D_2 = 0.35 G_2$$

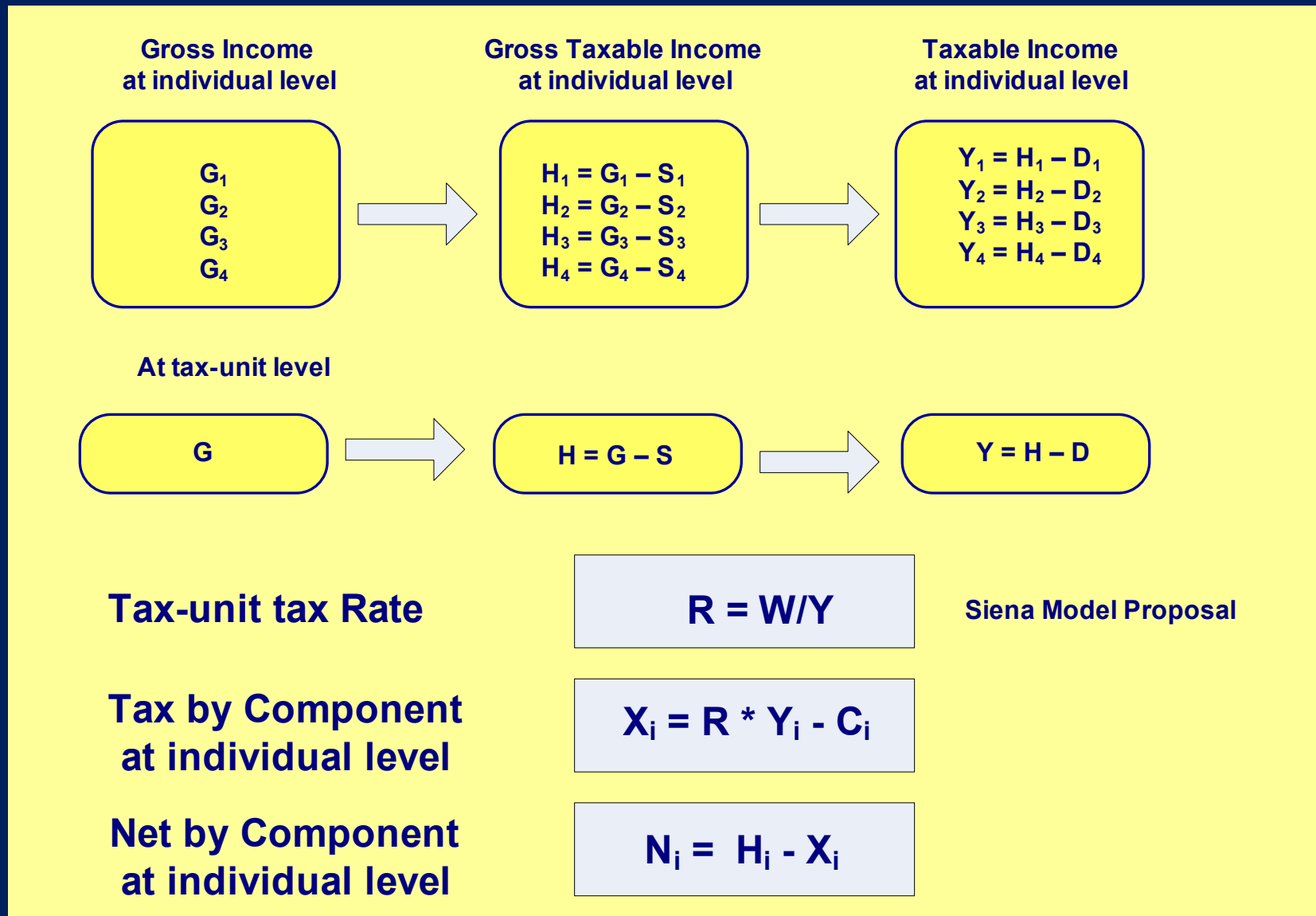
$$D_3 = D_3 (G_3) = \min (G_3; \text{Max} D_3)$$

$$D_4 = 0$$

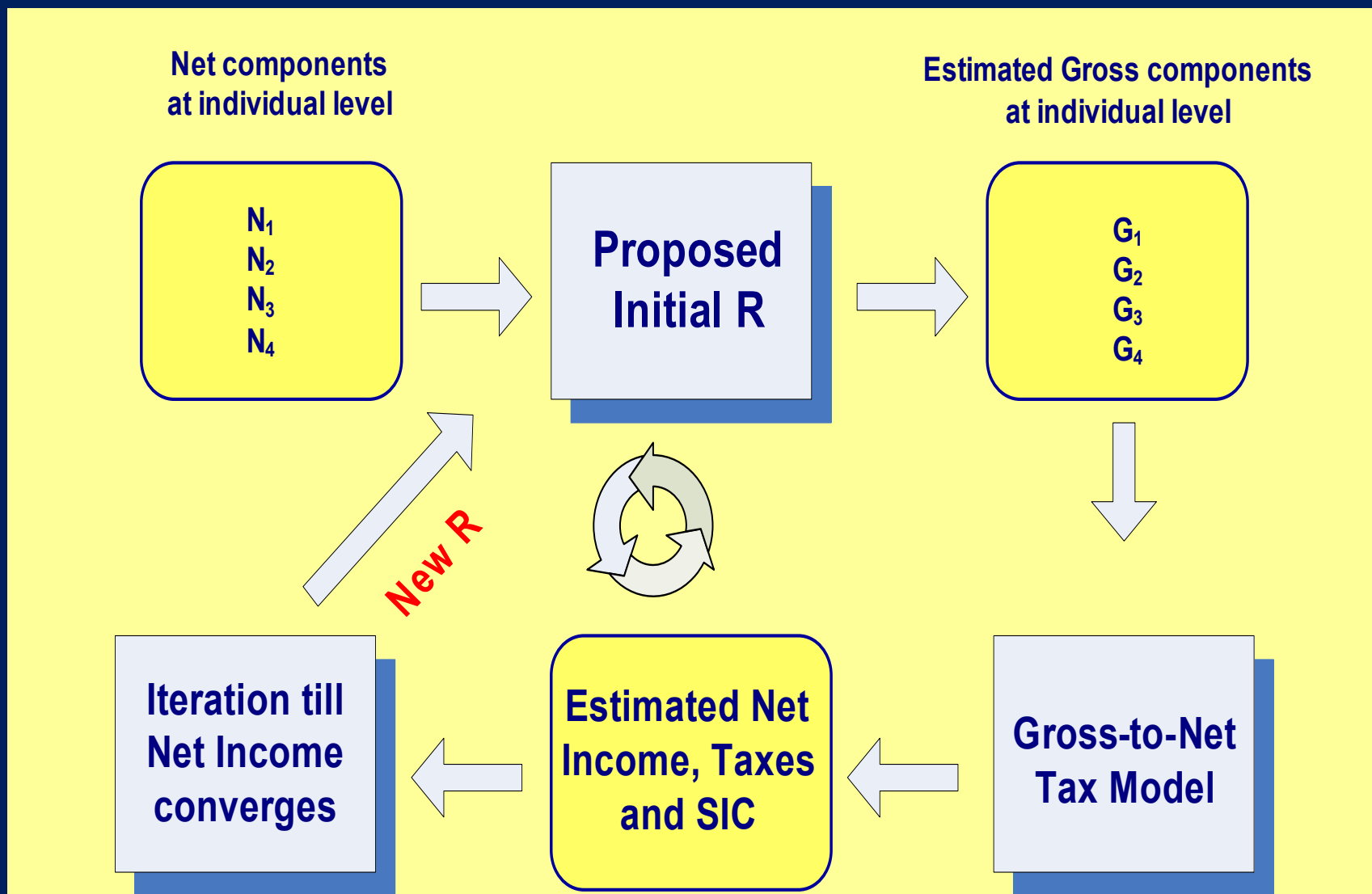
Determination of net incomes components (1)



Determination of net incomes components (2)



Net to Gross Model



Two additional problems:

- “Net at source”.
- “Mix Incomes”.

“Net at Source” to Gross: Employment income

$$\begin{aligned}\overline{N}_1 &= G_1 - S_1(G_1) - TR_1(G_1, DC) \\ &= G_1 - \beta_{11} G_1 - \beta_{12} G_1\end{aligned}$$

$$\beta_{12}(G_1, DC) \Rightarrow \beta_{12}(\overline{N}_1, DC)$$

$$G_1 = \frac{\overline{N}_1}{1 - \beta_{11} - \beta_{12}}$$

“Net at Source” to Gross: Self-Employment Inc.

$$\begin{aligned}\overline{N_2} &= G_2 - TR_2(G_2) \\ &= G_2 - \beta_{22} G_2\end{aligned}$$

$$G_2 = \frac{\overline{N_2}}{(1 - \beta_{22})}$$

“Net at Source” to Gross: Pensions

$$\begin{aligned}\overline{N}_3 &= G_3 - TR_3(G_3, DC) \\ &= G_3 - \beta_{32} G_3\end{aligned}$$

$$\beta_{32}(G_3, DC) \Rightarrow \beta_{32}(\overline{N}_3, DC)$$

$$G_3 = \frac{\overline{N}_3}{1 - \beta_{32}}$$

The “net at source” problem:

- ❑ Using “net income at source” as “net income” could introduce real problems in the tax-system model, namely the under/overestimation of taxes/disposable income
- ❑ If **clearly identified** the record income as “net at source” the process of converting from net to gross could be significantly simplified.
- ❑ If all income variables of a household that are relevant to the net to gross procedure are recorded net of contributions and taxes retain at source than it’s not necessary a full model to obtain the gross components of income.
- ❑ It’s possible to obtain each gross income component in a “stand alone” process not influenced by other components of income.

The “mix income” problem:

- ❑ If recorded incomes are a mixture of “net at source” and “final net” or gross and “final net” we still could simplify the net to gross procedure.
- ❑ The gross components of income, both originally recorded as gross or resulting from the transformation of “net at source”, could be used as an original input of the interactive procedure described in the net to gross model.

Some final remarks:

- ❑ The proposed methodology to convert net incomes to gross in Portugal is very close or inspired with the one implemented by the Siena model.
- ❑ It could be used as a framework to build a specific net to gross model to Portugal ...
- ❑ ... or to help the integration of the Portuguese tax rules in a more general model like the Siena Model.

The initial (final) question:

- ❑ A Portuguese model to convert net to gross incomes.
- ❑ Using an integrated model (a fully “data based” model)
- ❑ Country specific model + an integrated framework to build a standardized set of routines.