

Workpackage 2: Dealing with extended facets of sustainability

Task 3

Economic development and sustainability in W8D and IMPEC models of the Polish economy

Poland – just like the majority of the new EU countries - still considerably lags behind the old EU members with respect to the standard of living. That is why socio-economic development is apparently given higher – at least by societal perception – priority to environmental protection. Although Poland not only is obliged to but also expresses strong willingness to develop in line with sustainability principles (the article 5 of her present constitution reads, “*The Republic of Poland shall safeguard the independence and integrity of her territory and ensure freedoms and rights of persons and citizens, safeguard the national heritage and shall ensure the protection of the natural environment pursuant to the principles of sustainable development.*”) it seems that relatively higher increases in the nation’s well-fare might be gained thanks to vital economic growth.

Investigations into the simultaneous feedbacks between economic performance and greenhouse gasses emission – carried out by means of a modified version of the W8D model – show, however, that it is possible to reconcile economic growth with environmentally friendly policies (see paper *Macroeconomic consequences of introducing taxes on carbon dioxide emission in Poland*). Nevertheless, this calls for some reasonable redistribution of the revenues due to the carbon taxes, with promotion of technological change in the first place.

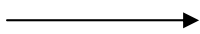
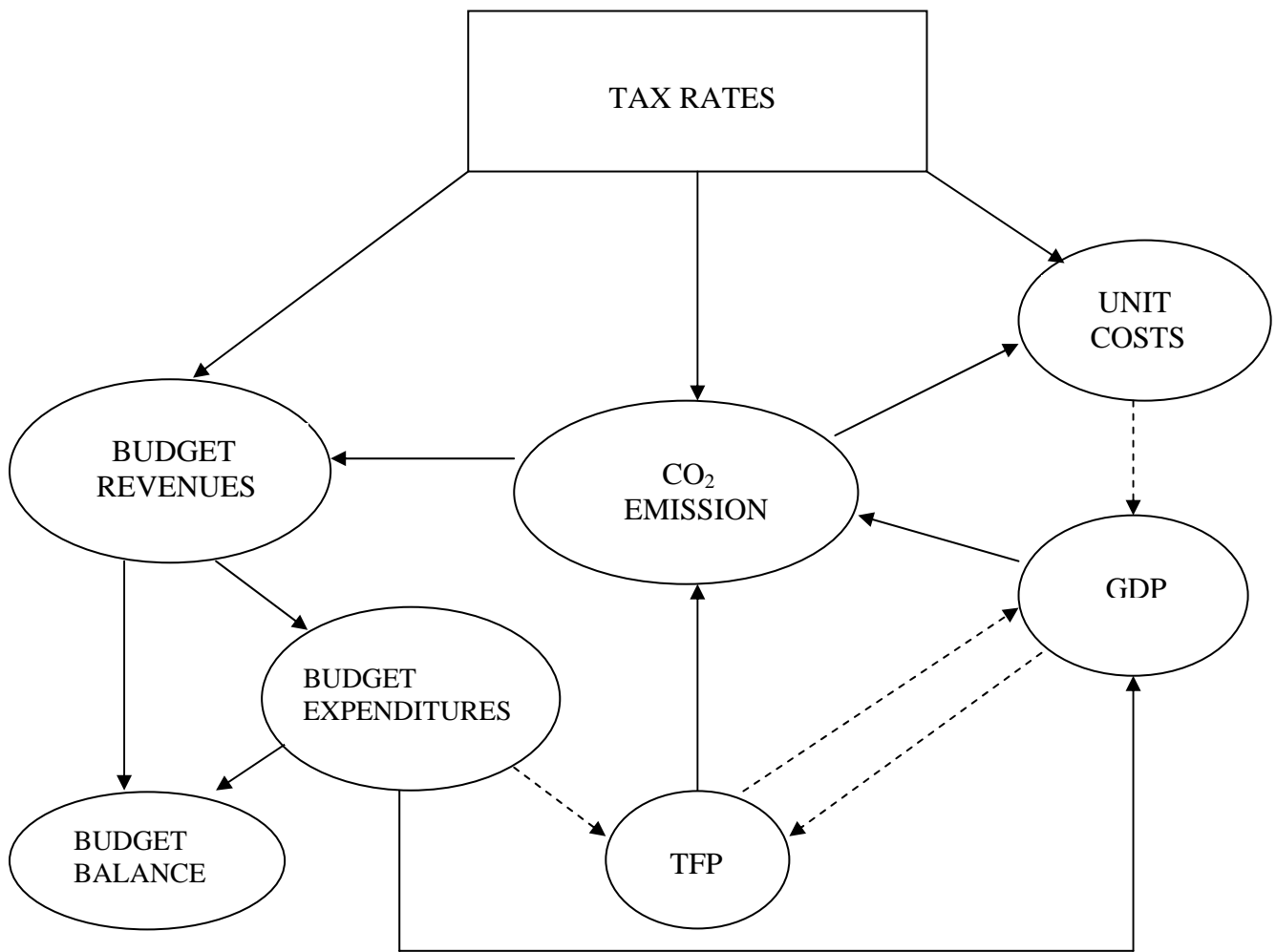
In the above mentioned research the effects of the introduction of CO₂ taxes on the emission volume itself and on the general economic activity was carried out through observing absolute or/and relative deviations from the baseline forecast presented in the previous section, in which no such taxes were existent. Three simulation scenarios were subject to the investigation. Their assumptions were as follows:

- a) scenario 1, *no recycling*: no re-investing of additional budget revenues due to the carbon taxes¹;
- b) scenario 2, *lump-sum recycling*: re-investing of the additional budget revenues in line with the existent structure of budget expenditures;
- c) scenario 3, *re-investing in R&D*: re-investing of the additional revenues in outlays on research and development activities, which means changing the existing structure of the budget expenditures.

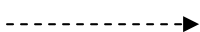
In general, by means of the new version of W8D one can analyze the effects of imposing any other ecological taxes upon the economic performance. The taxes trigger all the feedbacks existent in the model through shocking the unit price equation in line with the following scheme:

¹ Which is tantamount to breaching the direct link between the budget revenues and budget expenditures, presented in the scheme. Thus the additional revenues due to CO₂ emission do not feed the economy on the demand side, leading only a decrease in the state budget and, consequently, in the public debt.

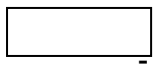
The ecological feedback in the W8D model



- direct impact



- indirect impact (indirect impact means that, for clarity of presentation, some relationships linking respective variables were deliberately omitted)



- exogenous variable



- endogenous variable

As for the IMPEC model – given total emission volume and economic activities – it will be possible to disaggregate the emission by specific greenhouse gasses and total value added (GDP) by sectoral layout.