Press release on the article "The EIRIN Flow-of-funds Behavioural Model of Green Fiscal Policies and Green Sovereign Bonds" published on Ecological Economics on 22 August 2017 DOI: 10.1016/j.ecolecon.2017.07.029

Meeting the Paris Agreement and the Sustainable Development Goals requires an urgent reallocation of investments into low-carbon sectors. The introduction of green fiscal and monetary policies, and new financial instruments such as green bonds, was recently advocated by practitioners and academics. However, deep uncertainty characterizes their design and their potential effects on growth, financial stability and inequality. The EIRIN flow-of-funds behavioural model developed by Irene Monasterolo and Marco Raberto contributes to fill in this gap investigating under which conditions green public policies and instruments can promote green investments by influencing firms' decisions (through NPV) and the credit market. Green sovereign bonds emerge as a short-term win-win solution for the low-carbon transition (new green investments, green jobs and capital accumulation) and credit market stability, while green fiscal measures have negative short-term feedbacks on the real economy. However, both interventions differ in terms of distributive effects on households' purchasing power and wealth concentration in the bank agent. This difference could be explained by the conditions - i.e., country's fiscal characteristics and fiscal elusion, budget balance constraints (e.g. fiscal compact) and interest on sovereign bonds - in which they are implemented. Further developments introduce the simulation of a green Quantitative Easing (QE) and macroprudential policies – on the climate-finance-inequality nexus.

Background

- Anthropogenic climate change was recognized as a main source of risk not only for ecosystems but also for the performance of the real economy (IPCC, 2014; Dietz et al 2016), inequality (Hsiang et al., 2017), and the stability of the financial system (ESRB, 2016; Battiston et al., 2017).
- The reallocation of investments towards sustainability is considered as a precondition to meet the interconnected objectives of sustainability and financial stability (HLEG, 2017). However, capital is not flowing in low-carbon projects at the pace and amount needed.
- Green policies such as green fiscal and green monetary policies (Monnin and Barkawi, 2015), and the introduction of new financial instruments, (e.g., green bonds), gained attention as tools to overcome the green investment gap.
- However, there is high uncertainty about their design and implementation, due to the lack of consolidated knowledge on their direct and indirect effects on the real economy and on financial markets, and their distributive effects (income inequality and wealth concentration) across economic sectors and social groups.

Novelty of research

- Economists Irene Monasterolo (Vienna University of Economics and Business, WU, and Boston University, BU) and Marco Raberto (University of Genoa, UNIGE) have developed the EIRIN flow-of-funds behavioural model to analyse the role of green fiscal policies and green sovereign bonds on firms' investments in the low-carbon transition, credit market performance, and the distributive effects in terms of wealth concentration.
- EIRIN brings three main novelties: (i) endogenous green technology investments and their effects on green technology adoption and thus on the level of resource efficiency of the production process; (ii) displaying the (negative) feedback loops of resource intensive production and consumption on the performance of the real economy, balance of payments and credit market; (iii) Introducing two sets of green public interventions i.e., green fiscal

measures or green sovereign bonds.

Methodology

- EIRIN is a demand-driven Stock-Flow Consistent model rooted on a balance sheet approach that tracks all transactions among the sectors, and the relations between the changes in stocks of assets and liabilities with the changes in the corresponding flows.
- In the Post-Keynesian tradition, the model embraces endogenous money creation (Mc Leary et al. 2014) and modern money theory (Wray 2015).
- The model includes heterogeneous economic sectors with adaptive behaviours and expectations (households, firms); capital goods (green/brown) characterized by different resource and R&D intensity, and jobs' skills; a bank; foreign sector that exports raw materials; a government deciding on the fiscal policy and issues green bonds; a Central Bank in charge of setting the monetary policy.

Findings

- Under the model's assumptions, green policies implemented through the issuance of green sovereign bonds represent a short-term win-win solution for the transition to a low-carbon economy and credit market stability, thanks to the new green investments that contribute to decrease the import of raw materials.
- Green scenarios differ in terms of distributive effects on households' purchasing power and wealth concentration in the credit sector, each with cascade effects on the real economy and on the credit market.
- In the green sovereign bonds scenario, public debt increases with positive spillover effects on green growth and jobs but negative inter-generational equity effects (debt burden). Green sovereign bonds - being bought by the bank and representing an eligible asset for the Central Bank in case of green QE - contribute to increase in wealth concentration in the credit sector.
- In the green fiscal policies scenario, the government increases taxation to match the cost of the green subsidy and meet the budget balance constraint, affecting in particular the worker household's purchasing power already in the short-term. This, in turn, increases unemployment and decreases capital accumulation and bank's borrowing as a consequence of a less performing real economy.

Policy implications

- The conditions under which green fiscal policies and green sovereign bonds are implemented - i.e., country's fiscal regime, the presence of budget balance constraints, and the level of interest on sovereign bonds – are fundamental to explain the difference in distributive effects on the worker/capitalist households and on the commercial bank.
- In particular, constraining or relaxing the government's budget balance is crucial for explaining the short and long term macroeconomic and distributive effects in an economy characterized by budget balance constraints (such as the fiscal austerity measures in the EU).
- A word of caution should be spent on the green sovereign bonds scenario. The accumulation of green assets in the commercial bank contributes to increase wealth concentration in the credit sector and in the bank's shareholders (i.e., the capitalist household). After the last financial crisis, several analyses showed that wealth concentration in credit and financial institutions did not contribute to economic growth but accrued inequality (Van der Weide and

Milanovic, 2014; Ostry *et al*., 2014; Hardoon, 2015; Stiglitz, 2015).

- To avoid unintended – and undesirable effects on system's stability and on inequality – the issuance of green sovereign bonds should be combined with a clear conditionality on the eligibility of investments both for firms and for the commercial bank, in order to favour bank's lending to low-carbon investments.

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