Capital- and finance-based environmental accounting framework

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Achieving the goals of the Paris Agreement will require significant investment to replace the current capital stock with less carbon-intensive alternatives. The success of this transition depends largely on the actions of capital owners who control the production process and can direct investments towards cleaner technologies. However, such investments and the production process often require feasible third-party financing.

In this context, we propose a new environmental accounting framework that distributes the responsibility for the environmental impacts of economic sectors between capital owners and the financial system based on the sectorsâ€™ debt-to-asset ratio. For example, if this ratio is 0.4 for a sector, 40% of its assets are financed by third parties and therefore 40% of its emissions can be allocated to the financial side, while the remaining 60% can be allocated to the sectorâ€™s capital owners. We apply this environmental accounting framework to the Spanish economy. First, we calculate sectorial capital- and finance-based emissions accounts according to the sectorsâ€™ debt-to-asset ratio. The capital- and finance-based emissions intensities are fed into an environmentally extended multi-regional input-output model to calculate environmental responsibilities according to the production and consumption criteria, but differentiating between which part of environmental responsibilities is linked to the sectorsâ€™ net worth, and therefore to its owners, and which part is linked to debt, and therefore to the financial system. Data used comes from the FIGARO database and environmental satellite accounts. We apply the methodology proposed for the Spanish economy, and therefore, we use sectorial debt-to-asset ratios from the Central Balance Sheet Database of the Bank of Spain.

This work extends prior applications that have calculated the environmental responsibility of specific financial institutions according to the criteria developed by the Task Force on Climate-related Financial Disclosures (TFCD, 2021). However, our contribution is that we present indicators of environmental responsibility based on capital and finance for all economic sectors consistent with the national accounts. Furthermore, the framework allows us to go beyond the current literature on production- and consumption-based emissions, where emissions are allocated based on production transaction flows. Our proposal allocates these responsibilities between owners and lenders based on economic sectors' financial balance sheet stocks and production transaction flows.