A Minimal Mathematical Model for Modern Monetary Theory

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Since being publicly endorsed by the likes of Representative Alexandria Ocasio-Cortez and Senator Bernie Sanders, Modern Monetary Theory broke away from the confines of academic discussions and capture the imagination of the public, ranging from political activists to prominent investors and fund managers. At its core, MMT combines a careful examination of the way in which a government funds its operations with bold policy proposals. Critics contend the predominance of verbal descriptions of the theory over formal mathematical models make it hard to fully evaluate its tenets and conclusions.

In this paper we present a stock-flow consistent model incorporating all essential aspects of MMT, including the fiscal and monetary operations of a government with a sovereign currency and the interactions of the domestic economy with the foreign sector. Crucially, the model also incorporates a disaggregated private sector consisting of firms, banks, and households, allowing for a more detailed analysis of its interactions with the public sector than is possible when the private sector is considered in aggregate. We also introduce the key policy proposal of MMT into the model, namely a job guarantee offered by the government.

Mathematically, the model consists of a high-dimensional system of differential equations, and we carefully explore its possible asymptotic states, including bifurcations with respect to the size of government spending.