# Overview

## Purpose and Patterns

## Entities, State Variables, and Scales

## Process overview and scheduling

# Design Concepts

## Basic Principles

## Emergence

## Adaptation

## Objectives

## Learning

## Prediction

## Sensing

## Interaction

## Stochasticity

## Collectives

## Observation

# Details

## Initialization

we adopted the six-step strategy proposed by Caiani et al. [1]. This strategy involves:

1. creating an aggregate version of the agent-based model
2. constraining it to a real stationary state (SS) associated with a nominal steady growth of prices and wages 
3. numerically solving the constrained model with reasonable values of parameters to obtain initial values of stocks, flows and prices
4. distributing these initial values uniformly across agents created within each sector
5. determining the original amount, outstanding values, age of durable stocks
6. setting the initial network configuration by assigning randomly contractors or suppliers to agents

presenter les matrices de stocks et flux a obtenir

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Households | Firms | Banks | Government | Central bank |  |
| HP Money |  |  |  |  |  |  |
| Cash Advances |  |  |  |  |  |  |
| Deposits |  |  |  |  |  |  |
| Bonds |  |  |  |  |  |  |
| Loans |  |  |  |  |  |  |
| Balance |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Households | Firms | Banks | Government | C. bank |  |
| Consumption |  |  |  |  |  |  |
| Wages |  |  |  |  |  |  |
| Transfers |  |  |  |  |  |  |
| Taxes |  |  |  |  |  |  |
| Interests on advances |  |  |  |  |  |  |
| Interests on bonds |  |  |  |  |  |  |
| Interests on loans |  |  |  |  |  |  |
| Interests on deposits |  |  |  |  |  |  |
| Entrepreneurial profits |  |  |  |  |  |  |
| Central Bank profits |  |  |  |  |  |  |
| Variation of advances |  |  |  |  |  |  |
| Variation of bonds |  |  |  |  |  |  |
| Variation of HP Money |  |  |  |  |  |  |
| Variation of loans |  |  |  |  |  |  |
| Variation of deposits |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

### Computation of initial stocks, flows and prices

We divided the SS system of equations of the aggregated model in three sub-systems or block. Description de la methode de resolution

#### Firms stationary state equations

The first block contains the equations which refer to firms.

mesurer la mise en oeuvre d’une politique public a travers le concept d’intensite de l’instrument

let x be the variation and y the rate, such that:





For each category of firms :











for firms of modern sector













for firms of rural or urban traditional sectors :









#### Households stationary state equations

the second presents the set of equations related to households and rural households















urban households:























#### Banks stationary state equations

the third refers to banks and the public sector (government and central bank).















#### Public sector stationary state equations

the third refers to banks and the public sector (government and central bank).

















### Creation of agents, networks and environment

presentation des agents, de la méthode de creation des networks, du placement des agents dans l’environment.

## Input Data

parametres

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Code** | **Description** |
|  | g\_ss | Grow rate of prices and wages in stationary state |
|  | N\_E1 | Number of entrepreneurs in sector 1 |
|  | N\_E2 | Number of entrepreneurs in sector 2 |
|  | N\_E3 | Number of entrepreneurs in sector 3 |
|  | N\_W1 | Number of employees in sector 1 |
|  | N\_W2 | Number of employees in sector 2 |
|  | N\_W3 | Number of employees in sector 3 |
|  | N\_WG | Number of employees in public sector |
|  | N\_U | Number of unemployed |
|  | phi1 | Productivity in sector 1 |
|  | phi2 | Productivity in sector 2 |
|  | phi3 | Productivity in sector 3 |
|  | w1 | Initial wage in sector 1 |
|  | w2 | Initial wage in sector 2 |
|  | w3 | Initial wage in sector 3 |
|  | w\_G | Initial wage in public sector |
|  | w\_min | Minimum wage |
|  | tau | Tax rate |
|  | rho | Dividend policy |
|  | m | Markup rate |
|  | alpha\_b1 | Propension to consume goods 1 in urban region |
|  | alpha\_a2 | Propension to consume goods 2 in rural region |
|  | theta\_W | Desired portion of wage bill |
|  | theta\_E | Desired portion of wage bill |
|  | theta\_Ubar | Reglementary portion of minimum wage dedicated to dole |
|  | r\_D | Interest rate on deposits |
|  | r\_L | Interest rate on loans |
|  | r\_B | Interest rate on bonds |
|  | r\_A | Interest rate on cash advances |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## Submodels

**References**

1. Caiani, Alessandro, Antoine Godin, Eugenio Caverzasi, Mauro Gallegati, Stephen Kinsella, and Joseph E. Stiglitz. 2016. Agent based-stock flow consistent macroeconomics: Towards a benchmark model. *Journal of Economic Dynamics & Control*: 375–408.