Debt, Boom, Bust: A Theory of Minsky-Veblen Cycles

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Jakob Kapeller
University of Linz
Department of Philosophy and Theory of Science

Bernhard Schütz
University of Linz
Department of Economics
As bankers turn from a cash-flow orientation to an orientation towards collateral value and expected values of assets, a fragile financial structure emerges.

A period of successful functioning of the economy leads to more risky loan provision ("stability breeds instability") of credit (Veblen 1970[1899], p. 70). The last items of this category of consumption are not given up except under the stress of the direst necessity" (Veblen 1970[1899], p. 80).

Increasing income inequality

Rising demand for credit

Rising supply of credit

Debt-financed consumption boom

Consolidation

Depression

Burst of the bubble

Veblen (1899):

Minsky (1986):

Rising income inequality

117.4%

97.9%

103.5%

104.7%

88.7%

3.7%

-7.4%

11.2%

22.7%

49.0%

-20.0%

0.0%

20.0%

40.0%

60.0%

80.0%

100.0%

120.0%

140.0%

Lowest fifth

Second fifth

Third fifth

Fourth fifth

Highest fifth


Increasing income inequality

Rising demand for credit

Rising supply of credit

Debt-financed consumption boom

Consolidation

Depression

Burst of the bubble
Background

- **Income inequality** as a major factor leading to the crisis:

- Importance of **relative consumption concerns**:

- Crisis as a **“Minsky moment”**:
Research question

- Can the recent crisis be interpreted as part of a larger cycle?
- Can we create such cycles in a simulation and if yes, what assumptions are necessary?
Basic model components

- Basic Framework: **Stock-flow consistent modeling** (Lavoie/Godley 2002, Godley/Lavoie 2007)
  - Keeps track of all stock developments
  - Ensures that all flows and money stocks within the model add up to zero in order to avoid model inconsistencies
- **Closed economy Post Keynesian model** with **two classes** (workers and capitalists), **no fiscal activity** by the state and a **Minskyan banking sector**
- **2 types of workers**
  - Initially both groups are identical – later on type 2 workers will lose income relative to type 1 workers.
## Flow matrix

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<thead>
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<th>Households</th>
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<th>Firms</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Worker 1</td>
<td>Worker 2</td>
<td>Capitalists</td>
<td>Current</td>
<td>Capital</td>
<td>Current</td>
<td>Capital</td>
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<tr>
<td>Consumption</td>
<td>$-C_{w1}^d(t)$</td>
<td>$-C_{w2}^d(t)$</td>
<td>$-C_{c}^d(t)$</td>
<td>$+C^s(t)$</td>
<td>$+I^d(t)$</td>
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<td>[Y(t)]</td>
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<tr>
<td>Investment</td>
<td>$+w_{w1}(t)N_{w1}(t)$</td>
<td>$+w_{w2}(t)N_{w2}(t)$</td>
<td></td>
<td>$-w_{w1}(t)N_{w1}(t)$</td>
<td>$-w_{w2}(t)N_{w2}(t)$</td>
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<td>$-rM(t-1)$</td>
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<td>[Production]</td>
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<tr>
<td>Wages</td>
<td>$+rM_{w1}(t-1)$</td>
<td>$+rM_{w2}(t-1)$</td>
<td>$+rM_{c}(t-1)$</td>
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<td>$+\phi M_{w1}(t-1)$</td>
<td>$+\phi M_{w2}(t-1)$</td>
<td>$+\phi M_{c}(t-1)$</td>
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<tr>
<td>Repayment</td>
<td>$-\phi M_{w1}(t-1)$</td>
<td>$-\phi M_{w2}(t-1)$</td>
<td>$-\phi M_{c}(t-1)$</td>
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<td>$-\chi M_{w1}(t-1)$</td>
<td>$-\chi M_{w2}(t-1)$</td>
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<td>Debt Cancelation</td>
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<tr>
<td>Profits</td>
<td>$+\pi_f\Pi_f(t) + \pi_b\Pi_b(t)$</td>
<td></td>
<td>$-\Pi_f(t) + (1-\pi_f)\Pi_f(t)$</td>
<td></td>
<td></td>
<td>$-\Pi_b(t) + (1-\pi_b)\Pi_b(t)$</td>
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<tr>
<td>Δ Deposits</td>
<td>$-\Delta M_{w1}(t)$</td>
<td>$-\Delta M_{w2}(t)$</td>
<td>$-\Delta M_{c}(t)$</td>
<td>$-\Delta M_f(t)$</td>
<td>$\Delta M(t)$</td>
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Consumer behavior –
Modeling relative consumption concerns

- **Type 1 workers:**

\[
C_{w1}^d(t) = \frac{1}{1 + \beta} a_0 + a_1 \left[ YD_{w1}(t) - \frac{1}{1 + \beta} a_0 \right]
\]

\[\beta = \frac{N_{w2}}{N_{w1}}\]

\[a_0\ldots\text{aggregate subsistence level consumption working class}\]

\[YD\ldots\text{disposable income}\]

- **Type 2 workers:** Similar to type 1 workers as long as disposable income is **not less** than those of type 1; afterwards it changes to:

\[
C_{w2}^d(t) = -\alpha \left( \frac{\beta}{1 + \beta} a_0 + a_1 \left[ YD_{w2}(t) - \frac{\beta}{1 + \beta} a_0 \right] \right) + \alpha C_{w1}^d(t) \beta
\]

\[\alpha\ldots\text{relative consumption parameter}\]
Investment, capital, employment and production

**Investment:**

\[ I^d(t) = i_0 + i_1 z(t - 1) + i_2 RR(t - 1) \]

- \( z \)...capacity utilization \([= Y/(nK)]\)
- \( RR \)...rate of return \([= \Pi/K]\)

**Capital stock:**

\[ K(t) = K(t - 1) + I^s(t - 1) - \delta K(t - 1) \]

- \( \delta \)...depreciation rate

**Employment:**

\[ N_{W1}^d(t) = \frac{Y(t)}{PR} \frac{1}{1 + \beta} \quad N_{W2}^d(t) = \frac{Y(t)}{PR} \frac{\beta}{1 + \beta} \]

- \( PR \)...labor productivity

**Aggregate output:**

\[ Y(t) = C^d(t) + I^d(t) \]
Banking sector

- Workers $i = 1, 2$ are granted loans as long as
  \[ w_{wi}(t)N_{wi}^{d}(t) \geq -M_{L}(t) + \phi M_{wi}(t - 1) + \theta_{wi}(t) \]
  \[ r_{L} \text{...real interest rate on loans} \]
  \[ \phi \text{...installment rate} \]

- Margin of safety:
  \[ \theta(t) = \theta(t - 1)(1 + \mu) + \zeta L(t) \]
  \[ \mu = (-\gamma) \text{ if no bankruptcies occur in a given period, otherwise } \mu = \tau (\tau >> \gamma) \]
  \[ L \text{...absolute value of negative deposits (=total debt)} \]

- Debt cancelation in case of bankruptcy:
  \[ \Delta M_{wi} = -\chi M_{wi} = cancel_{wi} \]

- Interest rate:
  \[ r_{L}(t) = r_{L}(t - 1) + \rho \Delta L(t) \]
Simulation scenarios

- **Scenario 1:** Baseline case
- Increasing inequality, *unlimited* credit supply:
  - **Scenario 2:** No relative consumption concerns
  - **Scenario 3:** Relative consumption concerns
- Increasing inequality, relative consumption concerns, *limited* credit supply:
  - **Scenario 4a:** Speculative dynamics
  - **Scenario 4b:** Ponzi dynamics
  - **Scenario 4c:** Hedge dynamics
Scenario 1: Baseline case

- **Assumptions:**
  - Income distribution **constant**

- **Results:**
  - Production and aggregate income slightly increasing (interest income)
  - No household debt
Scenario 2: Inequality and contraction

- **Assumptions:**
  - Income of type 2 workers *decreases*
  - No relative consumption concerns

- **Results:**
  - Decrease in consumption
  - Decrease in aggregate income
  - No household debt
Scenario 3: Inequality and contraction

- **Assumptions:**
  - Income of type 2 workers decreases
  - Relative consumption concerns
  - Unlimited credit supply

- **Results:**
  - Initial expansion due to conspicuous consumption and increased debt
  - Followed by a **stagnation phase** (workers reduce spending and roll over debt)
  - **Boom** induced by capitalist consumption out of (debt-financed) interest payments
Scenario 4a: Speculative dynamics

- Assumptions:
  - Income of type 2 workers decreases
  - Relative consumption concerns
  - Limited credit supply

- Result: Minsky-Veblen Cycles #1
  - Expansion (speculative financing)
  - Followed by compression phase (type 2 workers reduce consumption)
  - Panic and bankruptcies
  - Consolidation
Discussion

- Economies can display the following Minsky-Veblen Cycles:

![Minsky-Veblen cycle from scenario 4a (periods 150-250)](image)

- What it needs are:
  - Increasing income inequality
  - Relative consumption concerns
  - A financial sector as described by Minsky
Discussion: Output-Debt dynamics

- In the beginning, we assumed the output-debt cycle to have the following rough properties,...

- which are well in line with our simulation results
Discussion: Output-Debt dynamics

- Course of the cycle:
  - „Expansion“: growth accommodated by rising debt levels
  - „Compression“: decreasing or stagnating output with further rising debt levels
  - „Panic“: rapidly falling output and banks writing off debt
  - „Consolidation“: growth accommodated by decreasing debt levels

Output-debt dynamics (Scenario 4a, periods 100-220)
Scenario 4b: Ponzi dynamics

- Assumptions:
  - Income of type 2 workers decreases
  - Relative consumption concerns
  - Limited credit supply
  - Less prudent banks (ζ decreases)

- Result: Minsky-Veblen Cycles #2
  - Households become Ponzi-financing units
  - Cycles display longer duration and larger amplitude
Scenario 4c: Hedge dynamics

- **Assumptions:**
  - Income of type 2 workers decreases
  - Relative consumption concerns
  - Limited credit supply
  - Very prudent banks ($\zeta$ increases)

- **Result:** Minsky-Veblen Cycles #3
  - Households remain hedge-financing units
  - Cycles display short duration and small amplitude
Conclusions and future prospects

- Increasing income inequality, relative consumption concerns and a Minskyan financial sector can give rise to Minsky-Veblen Cycles
  - Cautiousness of banks as a central factor determining the length of the associated cycles.
- Our story stops with the financial crisis
- Including the subsequent sovereign debt crisis is outside of the scope
- However, negative bank balances displayed in our simulation indicate where this would lead, and how this may provide an even richer story of MVC:
  - Negative bank balances are reallocated to the governmental sector
  - Sovereign debt crisis, austerity programs, ...
Thank you for your attention!
Figure 4.2: Simulation results for scenarios 1-3
Appendix

Figure 4.3: Simulation results for scenarios 4-6

Scenario 4a: Minsky-Veblen Cycles - Speculative Dynamics

Scenario 4b: Minsky-Veblen Cycles - Ponzi Dynamics

Scenario 4c: Minsky-Veblen Cycles - Hedge Dynamics