Political Aspects of Household Debt: A Neo-Kaleckian Approach

Yun K. Kim\textsuperscript{1}  Gilberto Tadeu Lima\textsuperscript{2}  Mark Setterfield\textsuperscript{3}

\textsuperscript{1}Department of Economics
University of Massachusetts Boston

\textsuperscript{2}Department of Economics
University of S\~{a}o Paulo

\textsuperscript{3}Department of Economics
New School For Social Research
Research Motivation

- Previous research has focused on rising income inequality as a main cause of household borrowing: Barba and Pivetti (2009), Kumhof and Ranciere (2010), Foster and Magdoff (2009), and Carr and Jayadev (2013).

- Explore implications of household debt accumulation on labor market, workers bargaining power, and income inequality, and its consequence on macrodynamics; household debt can play a significant role of disciplinary means as unemployment does in Kalecki’s ”Political Aspects of Unemployment.”
Veblen (1899) and Duesenberry (1949): consumption emulation and relative income hypothesis


Barba and Pivetti (2009), Kumhof and Ranciere (2010), Foster and Magdoff (2009), and Carr and Jayadev (2013): rising income inequality as a cause of household borrowing.


Objective

- Household debt and employment rent nexus
  - What kind of effect does rising household indebtedness have on the employment rent, and hence workers’ bargaining power?
  - What kind of effect does rising household indebtedness have, through the channel of the employment rent, on workers’ wage and wage share?

- Building upon the household debt and employment rent nexus, investigate debt-distribution dynamics through a stock-flow consistent Post-Keynesian growth model with consumption emulation.
  - What is the effect of consumption emulation on debt-distribution dynamics?
  - What is the implication of strong demand effect on distribution dynamics?
  - What is the effect of a higher interest rate on debt-distribution dynamics?
## Balance Sheets

<table>
<thead>
<tr>
<th></th>
<th>Workers</th>
<th>Capitalists</th>
<th>Firms</th>
<th>Banks</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td></td>
<td></td>
<td>$K$</td>
<td>$K$</td>
<td></td>
</tr>
<tr>
<td>Deposits</td>
<td></td>
<td>$D_W$</td>
<td></td>
<td>$-D_W$</td>
<td>0</td>
</tr>
<tr>
<td>Loans</td>
<td>$-D_W$</td>
<td></td>
<td></td>
<td>$D_W$</td>
<td>0</td>
</tr>
<tr>
<td>Equities</td>
<td></td>
<td>$E$</td>
<td>$-E$</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Net worth</td>
<td>$NW_W$</td>
<td>$NW_R$</td>
<td>$NW_F$</td>
<td>$NW_B$</td>
<td>$K$</td>
</tr>
</tbody>
</table>

## Transaction Flow Matrix

<table>
<thead>
<tr>
<th></th>
<th>Workers</th>
<th>Capitalists</th>
<th>Firms</th>
<th>Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current</td>
<td>Capital</td>
<td>Current</td>
<td>Capital</td>
</tr>
<tr>
<td>Consumption</td>
<td>$-C_W$</td>
<td>$-C_R$</td>
<td>$C_W + C_R$</td>
<td></td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td>$I$</td>
<td>$-I$</td>
</tr>
<tr>
<td>Wages</td>
<td>$W_rL$</td>
<td></td>
<td></td>
<td>$-W_rL$</td>
</tr>
<tr>
<td>Firms’ profits</td>
<td></td>
<td>$\Pi$</td>
<td>$-\Pi$</td>
<td></td>
</tr>
<tr>
<td>Deposit interest</td>
<td>$iD_W$</td>
<td></td>
<td>$-iD_W$</td>
<td></td>
</tr>
<tr>
<td>Loan interest</td>
<td>$-iD_W$</td>
<td></td>
<td>$iD_W$</td>
<td></td>
</tr>
<tr>
<td>Change in deposit</td>
<td>$\dot{D}_W$</td>
<td>$-\dot{D}_W$</td>
<td></td>
<td>$\dot{D}_W$</td>
</tr>
<tr>
<td>Change in loans</td>
<td>$\ddot{D}_W$</td>
<td></td>
<td></td>
<td>$\ddot{D}_W$</td>
</tr>
<tr>
<td>Issues of equities</td>
<td>$-\dot{E}$</td>
<td>$\dot{E}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Workers

- Workers’s consumption is partly driven by the consumption of capital owners.

\[ \dot{D}_W = \beta CR Y \]

\[ W_r - iD_W + \beta CR \]

Ravina, 2007; Kim et al., forthcoming, Setterfield and Kim (2014)

\[ W_r - iD_W + \beta CR \]

\[ C_W = W_r - iD_W + \beta CR \]

Emulation parameter

Borrowing behavior of the workers: workers' borrowing is induced by their desire to emulate capital owners' consumption standard.
Workers

- Workers’s consumption is partly driven by the consumption of capital owners.

- Consumption Function (Ravina, 2007; Kim et al., forthcoming), and Setterfield and Kim (2014)

\[ C_W = W_r L - iD_W + \beta C_R \]

\( \beta \): emulation parameter
Workers

- Workers’s consumption is partly driven by the consumption of capital owners.
- Consumption Function (Ravina, 2007; Kim et al., forthcoming), and Setterfield and Kim (2014)
  \[ C_W = W_rL - iD_W + \beta C_R \]
  \( \beta \): emulation parameter
- Borrowing behavior of the workers: workers’ borrowing is induced by their desire to emulate capital owners’ consumption standard.
  \[ \dot{D}_W = \beta C_R \]
Capital Owners and Firms

- Consume a fraction of their profit and interest income and save the rest of them.
- Consumption Function

\[ C_R = (1 - s_R)(\Pi + iD_W) \]
Capital Owners and Firms

- Consume a fraction of their profit and interest income and save the rest of them.
- Consumption Function

\[ C_R = (1 - s_R)(\Pi + iD_W) \]

- Saving provides the funds for firms’ investment and workers’ borrowing.
- Credit Supply

\[ s_R(\Pi + iD_W) = \dot{D}_W + \dot{E} \]
Capital Owners and Firms

- Consume a fraction of their profit and interest income and save the rest of them.
- Consumption Function
  \[
  C_R = (1 - s_R)(\Pi + iD_W)
  \]
- Saving provides the funds for firms’ investment and workers’ borrowing.
- Credit Supply
  \[
  s_R(\Pi + iD_W) = \dot{D}_W + \dot{E}
  \]
- Investment: the current profit rate approximates the expected rate of return, and hence induces the investment expenditure (Blecker, 1999; Stockhammer, 1999); investment expenditure responds to the demand, an accelerator effect.
  \[
  g_K = \kappa_0 + \kappa_u u + \kappa_r r
  \]
Temporary Equilibrium

- **Goods Market Equilibrium**

  \[ Y = C_W + C_R + I \]

- **Endogenous Variables**

  \[ u = \frac{1}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u} [\kappa_0 - (s_R + s_R\beta - \beta)id_W] \]

  \[ r = \frac{\pi}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u} [\kappa_0 - (s_R + s_R\beta - \beta)id_W] \]

  \[ g_K = \frac{1}{\pi(s_R + s_R\beta - \kappa_r - \beta) - \kappa_u} [(\kappa_u + \kappa_r\pi)id_W - \kappa_0\pi][(1 - s_R)\beta1 - s_R] \]

  - \( u \), the rate of capacity utilization
  - \( r \), profit rate
  - \( g_K \), capital accumulation rate
Following Bowles (2004), we define the employment rent, $e$, as the value to the individual employee of retaining their current job:

$$ e = W_r - \left( \frac{u^d}{n} W_u + \left[ 1 - \frac{u^d}{n} \right] W_r \right) $$
Cost of Job Loss and the Employment Rent

Following Bowles (2004), we define the employment rent, $e$, as the value to the individual employee of retaining their current job:

\[ e = W_r - \left( \frac{u^d}{n} W_u + \left[ 1 - \frac{u^d}{n} \right] W_r \right) \]

Assuming that $\frac{u^d}{n} = \frac{1}{n}$:

\[ e = W_r - \left( \frac{u^d}{n} W_u + \left[ 1 - \frac{u^d}{n} \right] W_r \right) = \frac{1}{n} (W_r(x) - W_u) \]
Workers borrow to finance some part of their consumption spending and carry debt:

Jobs effectively act as collateral for loans:

\[ e = W_r + \dot{d}_W - id_W - \left( \frac{1}{n} (W_u - id_W) + \left[ 1 - \frac{1}{n} \right] (W_r + \dot{d}_W - id_W) \right) \]
Cost of Job Loss and Household Debt

- Workers borrow to finance some part of their consumption spending and carry debt:
- Jobs effectively act as collateral for loans:

\[
e = W_r + \dot{d}_W - id_W - \left( \frac{1}{n}(W_u - id_W) + \left[ 1 - \frac{1}{n} \right] (W_r + \dot{d}_W - id_W) \right)
\]

- Assuming \( W_u = 0 \),

\[
e = \frac{1}{n} (W_r + \dot{d}_W)
\]
Cost of Job Loss and Household Debt

- Workers borrow to finance some part of their consumption spending and carry debt:

- Jobs effectively act as collateral for loans:

\[
e = W_r + \dot{d}_W - id_W - \left( \frac{1}{n} (W_u - id_W) + \left[ 1 - \frac{1}{n} \right] (W_r + \dot{d}_W - id_W) \right)
\]

- Assuming \( W_u = 0 \),

\[
e = \frac{1}{n} (W_r + \dot{d}_W)
\]

- Note that:

\[
\frac{\partial e}{\partial \dot{d}_W} = \frac{1}{n} > 0
\]
From the definition of $d_W$ and $\dot{D}_W$,

$$
\dot{d}_W = \frac{\dot{D}_W}{K} - g_K d_W
= \beta(1 - s_R)(\pi u + id_W) - g_K d_W
$$

(1)
Cost of Job Loss and Household Debt

- From the definition of $d_W$ and $\dot{D}_W$,

$$
\dot{d}_W = \frac{\dot{D}_W}{K} - g_K d_W
= \beta (1 - s_R)(\pi u + i d_W) - g_K d_W
$$

- Combining this with $\frac{\partial e}{\partial d_W}$:

$$
\frac{\partial e}{\partial d_W} = \frac{\partial e}{\partial \dot{d}_W} \frac{\partial \dot{d}_W}{\partial d_W}
= \frac{1}{n} \frac{d(\dot{d}_W)}{d(d_W)} \geq 0
$$
Cost of Job Loss and Household Debt

- From the definition of $d_W$ and $\dot{D}_W$,

$$\dot{d}_W = \dot{D}_W / K - g_K d_W$$

$$= \beta (1 - s_R) (\pi u + id_W) - g_K d_W$$  

- Combining this with $\frac{\partial e}{\partial d_W}$:

$$\frac{\partial e}{\partial d_W} = \frac{\partial e}{\partial \dot{d}_W} \frac{\partial \dot{d}_W}{\partial d_W} = \frac{1}{n} \frac{d(\dot{d}_W)}{d(d_W)} \geq 0$$

$$\frac{\partial e}{\partial u} = \frac{\partial e}{\partial \dot{d}_W} \frac{\partial \dot{d}_W}{\partial u} = \frac{1}{n} \frac{\partial \dot{d}_W}{\partial u} \geq 0$$
Distribution Dynamics

- Real wage and employment rent:

\[ \dot{W}_r = f(e(d_w, u)) \]

where \( f_e < 0 \)
Distribution Dynamics

- Real wage and employment rent:
  \[ \dot{W}_r = f(e(d_w, u)) \]
  where \( f_e < 0 \)

- Note that \( \psi = W_r L/Y \), where \( Y \) is real output and hence \( L/Y \) is an inverse of labor productivity. Assuming the absence of technological change,
  \[ \hat{\psi} = \hat{W}_r \]
Distribution Dynamics

- Real wage and employment rent:

\[ \dot{W}_r = f(e(d_w, u)) \]

where \( f_e < 0 \)

- Note that \( \psi = W_r L / Y \), where \( Y \) is real output and hence \( L / Y \) is an inverse of labor productivity. Assuming the absence of technological change,

\[ \hat{\psi} = \hat{W}_r \]

- And hence,

\[ \dot{\psi} = \frac{L}{Y} \dot{W}_r = a \dot{W}_r \]

where \( a = \frac{L}{Y} \)
Distribution Dynamics

- Wage share dynamics:

\[ \dot{\psi} = a \dot{W} r = a f(e(d_w, u)) = \rho(d_W, u) \]

- Scenario 1: \( \rho_u > 0 \) and \( \rho_{dW} < 0 \)

\( \rho_{dW} < 0 \): Workers become more indebted \( \rightarrow \) Workers employment rent increases, and workers bargaining power decrease \( \rightarrow \) Their demand for a higher wage diminishes \( \rightarrow \) Negative effect on wage share.

\[ \dot{\psi} = \theta_0 + \theta_u u - \theta_{dW} d_W \]

\[ \dot{\psi} = \theta_0 - \theta_d d_W + \frac{[\kappa_0 - d_W i(sR - \beta + sR\beta)]\theta_u}{(sR + sR\beta - \beta - \kappa_r)(1 - \psi) - \kappa_u} \]
Debt Dynamics

\[ \dot{d}_W = \frac{\dot{D}_W}{K} - g_K d_W \]
\[ = \beta (1 - s_R)(\pi u + id_W) - g_K d_W \]  

(2)

\[ \dot{d}_W = \left[ -\kappa_0 \pi + d_W i(\kappa_u + \kappa_r \pi) \right] \frac{d_W s_R + (1 + d_W)(s_R - 1)\beta}{\pi(s_R + s_R \beta - \kappa_r - \beta) - \kappa_u} \]  

(3)
The parameter values we used are: $\kappa_0 = 0.045$, $i = 0.0481$, $s_R = 0.8$, $\kappa_r = 0.5$, $\beta = 0.2$, $\theta_0 = 0.2$, $\theta_u = 0.3$, and $\theta_d = 0.25$. 
A stronger emulation desire of workers

- A higher emulation parameter ($\beta = 2.92$); a permanent cycles around an unstable equilibrium ($\psi = 0.92$ and $d_W = 0.169$)
- If there is a stronger effect of the debt on the distribution (a higher $\theta_d$) with a stronger emulation desire, more frequent cycles with a smaller amplitude.
A stronger emulation desire of workers
A stronger emulation desire of workers

\[ dw(t) \]

Yun K. Kim, Gilberto Tadeu Lima, Mark Setterfield (Universities of Somewhere and Elsewhere)
A stronger demand effect on distribution with a stronger emulation desire ($\theta_u = 0.5$ and $\beta = 2.92$). A stable steady state, ($\psi = 0.931$ and $d_w = 0.148$)
A Stronger Demand Effect

$\psi(t)$

$0 \leq t \leq 1000$

$\Psi(t)$

Yun K. Kim, Gilberto Tadeu Lima, Mark Setterfield (Universities of Somewhere and Elsewhere)
A Stronger Demand Effect

\[ dw(t) \]

Yun K. Kim, Gilberto Tadeu Lima, Mark Setterfield (Universities of Somewhere and Elsewhere)
A higher interest rate with a stronger emulation desire ($i = 0.08$ and $\beta = 2.92$).
Summary and Conclusion

- Established the relationship between household indebtedness and employment rent (and workers bargaining power), and hence their wage and wage share.
- Based on that relationships, investigated debt-distribution dynamics in a stock-flow consistent Post-Keynesian growth model with consumption emulation.

▶ What is the effect of consumption emulation on debt-distribution dynamics?
▶ What is the implication of strong demand effect on distribution dynamics?
▶ What is the effect of a higher interest rate on debt-distribution dynamics?
Summary and Conclusion

- Established the relationship between household indebtedness and employment rent (and workers bargaining power), and hence their wage and wage share.

- Based on that relationship, investigated debt-distribution dynamics in a stock-flow consistent Post-Keynesian growth model with consumption emulation.
  - What is the effect of consumption emulation on debt-distribution dynamics?
  - What is the implication of strong demand effect on distribution dynamics?
  - What is the effect of a higher interest rate on debt-distribution dynamics?
Summary and Conclusion

- Strong emulation desire can induce permanent debt-distribution cycles.
- Strong positive influence of demand on distribution dynamics is stabilizing; debt-distribution cycle disappears.
- A higher interest rate is destabilizing: debt-capital ratio increases to a higher level and wage share decreases continuously (and naturally bounded by zero).
The End

Thank you!


**URL:** http://www.bepress.com/cas/vol3/iss2/art3/


