A Steindlian account of the distribution of corporate profits and leverage:
A stock-flow consistent macroeconomic model with agent-based microfoundations

Jo Michell

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INTRODUCTION

► In Post Keynesian economics, distribution of income between labour and capital determined by average mark-up of prices over costs in non-competitive markets

► Contrasts with Steindl’s (1952) theory of monopolisation—prices play dual role:
  ▶ micro: distribute profits among firms
  ▶ macro: distribute income between capital and labour

► Important influence on Post Keynesian growth theory: capacity utilisation

► PK growth theory → stock-flow consistent models

► No microeconomic distribution in SFC

► Agent based microfoundations?

► This paper: use Steindl to explore SFC-ABM synthesis in monetary circuit model
Income and Profit Distribution: Kalecki

- Kalecki: distribution between wages and profits determined by ‘average degree of monopoly’
- but ‘average degree of monopoly’ determined by degree of monopoly in each industry and relative weight of each industry.

The average degree of monopoly for the whole economy being a weighted mean is changed by a shift in output between industries. Thus it has little meaning to say that the distribution of income is ‘determined’ by the average degree of monopoly.

(Lange, 1941, p. p. 281)
The changes in the degree of monopoly are not only of decisive importance for the distribution of income between workers and capitalists, but in some instances for the distribution of income within the capitalist class as well. Thus, the rise in the degree of monopoly caused by the growth of big corporations results in a relative shift of income to industries dominated by such corporations from other industries. In this way income is distributed from small to big business.

(Kalecki, 1954, p. 18)
Income and profit distribution: Steindl (1952)

- Monopolisation leads to ‘maldistribution of profits’ and ‘enforced indebtedness’ of small firms
- Distinguishes between ‘cartelised’ sector and fringe of competitive firms
- Fall in aggregate demand:
  - Large firms cut output
  - Small firms cut prices
- Firms operate with (intentional) excess capacity
- Excess capacity reduces incentive to invest
- Monopoly capitalism distributes profits to firms least likely to use them productively
**Figure:** US capacity utilisation: total industry, per cent of capacity

Source: Federal Reserve Bank of St Louis
**Figure:** Consolidated balance sheet of US non-financial corporate sector

Source: Federal Reserve, own calculation
# Shift vs Share Effects

Source: ILO (2010)
**Stock flow consistent microfoundations**

- Model construction on basis of macroeconomic aggregates excludes processes driven by transactions between agents in the same sector (Michell & Toporowski 2012)
  - Debt-financed asset inflation (household sector)
  - Mergers and aquisitions (firms sector)
  - Share buybacks (households/firms)
  - Personal income distribution (households)
  - Systemic fragility in banking system—interconnectedness (banks)
  - Distribution of profits and leverage (firms)

- Solution: agent-based microfoundations? (Bezemer 2011; Kinsella, 2011)
ABM-SFC Steindl Model

- Spirit of Steindl, not letter.
- ‘Wage-led’ investment function for individual firms (all firms have same parameters)
- Heterogeneous firms → balance sheets, price mark-up.
- Households modelled as single consumption function.
- Horizontalist banking sector.
- Distribution of demand among firms based on size and stochastic element.
# Macroeconomic balance sheet

<table>
<thead>
<tr>
<th></th>
<th>Households</th>
<th>Firms</th>
<th>Banks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed capital</td>
<td>$+K$</td>
<td></td>
<td></td>
<td>$+K$</td>
</tr>
<tr>
<td>Inventories</td>
<td></td>
<td>$+IV$</td>
<td></td>
<td>$+IV$</td>
</tr>
<tr>
<td>Deposits</td>
<td>$+D_h$</td>
<td>$+D_f$</td>
<td>$-D_S$</td>
<td>0</td>
</tr>
<tr>
<td>Loans</td>
<td>$-L_D$</td>
<td>$+L_S$</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Total (Net Worth)</td>
<td>$NW_h$</td>
<td>$NW_f$</td>
<td>0</td>
<td>$(K + IV)$</td>
</tr>
</tbody>
</table>

**Table:** Macroeconomic balance sheet of the model.
Firms

\[ g_i^I = \gamma_0 + \gamma_r r_i(-1) + \gamma_u u_i(-1) \]  

- Investment decision based on previous period utilisation and profit rate
- Production decision based on previous period sales
- Firms hold inventories of consumption goods—a proportion of expected sales
- Sales and expected sales generally not equal—face problem of profit realisation
- Firms hold deposits to cover unexpected shortfalls—a proportion of costs
FIRMS

\[ \tau_i = \frac{N k_i}{K} T \] (2)

- Pricing decision determined on basis of market share
- Greater degree of monopoly \( \rightarrow \) greater mark-up
- T is overall ‘capital strength’ – in general not equal to ‘average degree of monopoly’
- Predict profits and liquidity on basis of previous period sales and growth rate
- Demand for loans based on expected and desired liquidity
Households

\[ C_D = \alpha_1 Y_h(-1) + \alpha_2 D_h(-1) \]  

- Consumption decision based on previous income and wealth
- Income determined aggregate demand: \( C + I \)
- Change in bank deposits = saving is residual
Banks

- Pure ‘horizontalist’ bank sector
- Exogenous rate of interest on loans = rate on deposits
AGGREGATE DEMAND

\[ e_i = \zeta \frac{k_i}{K} + (1 - \zeta)e_i \quad \text{(4)} \]

Where \( e_i \) is a stochastic variable such that \( \sum e_i = 1 \).

- Demand distributed among firms on basis of size and stochastic variable
- Exogenous rate of interest on loans = rate on deposits
**Bankruptcy**

- If firm has implied negative money balance at end of period → bankrupt
- Loans written off
- Household deposits reduced
- Capital stock remains – free lunch!
\( \zeta = 0.5 \)

\( \zeta = 0.7 \)

\( \zeta = 0.9 \)
ζ = 0.5

ζ = 0.7

ζ = 0.9

Distribution of loans

Distribution of money among firms

Net leverage among firms
$\zeta = 0.5$

$\zeta = 0.7$

$\zeta = 0.9$
\[ \zeta = 0.9, \gamma_T = 0.2, \gamma_u = 0.04 \]
\( \zeta = 0.9, \gamma_T = 0.3, \gamma_u = 0.01 \)
\[ \zeta = 0.9, \, \gamma_r = 0.3, \, \gamma_u = 0.01 \]

\[ \bar{r} = 0.06 \text{ at } 1100 \]
Concluding remarks

- Post Keynesian economics overlooks role of prices in distributing profits and role of market structure in distributing wages
- Steindl’s insights still relevant
- ABM provides a way to incorporate Steindl into SFC
- Demonstrates potential of method
- Plenty more possibilities!