Is the Pasinetti Theorem a theorem on income distribution?

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The Purpose of This Paper

- Keynes' General Theory is understood as a demand-led theory of employment.
- Kaldor's theory of income distribution is understood as a demand-led theory of income distribution,
  - in which the Principle of Effective Demand determines the income distribution instead of the level of employment.
- What in the case of the Pasinetti Theorem?
  - Is it a demand-led theory of income distribution?
  - What is the role of the Principle of Effective Demand in the Theorem?

The Pasinetti Theorem

$$\frac{P}{Y} = \frac{1}{s_c}\frac{I}{Y} \tag{1}$$

$$\frac{P}{K} = \frac{g}{s_c} \tag{2}$$

where P: profit, Y: income, I: investment, K: capital, g: growth rate, s_c: capitalists' propensity to save.

– These are derived as follows. In the long-run equilibrium, the profit rate for capitalist' capital is equal to that for workers' capital, i.e. $P_c/K_c = P_w/K_w = P/K$, and capitalist' and workers' shares of capital is constant, i.e. $K_c/S_c = K_w/S_w = K/S$. Therefore, $P/S = P_c/S_c$, from which $P = S/s_c$. Since $I = S$ according to the principle of effective demand, $P = I/s_c$, from which the above two equations results.

The Implications of the Theorem

- It means that, in the long run, workers' propensity to save, though influencing the distribution of income between capitalists and workers, does not influence the distribution of income between profits and wages. Nor does it have any influence whatsoever on the rate of profit. (Pasinetti 1962, p.272)
- The Cambridge equation confirms Keynes' and Kalecki's intuitive results obtained in the early 1930s on a higher level of generality: even if workers save, their propensity to save does not influence the profit share and the rate of profits. (Bortis 1993, p.107)
  - Keynes' intuitive results: 'higher investment levels and more spending on consumption out of profits lead to larger profit volumes: "profits...are a widow's cruse..." ' (*idem*, p.106).

The Role of the Principle of Effective Demand(1)

- 'The principle of the Multiplier (which in some way was anticipated in the *Treatise* but without a clear view of its implications) could be alternatively applied to a determination of the relation between prices and wages, if the level of output and employment is taken as given, or the determination of the level of employment, if distribution (i.e., the relation between prices and wages) is taken as given. ...
  And its use for the one appears to exclude its for the other.' (Kaldor 1956, p.94)

The Role of the Principle of Effective Demand(2)

- Kaldor asigned the role of determining the level of income to the short-term, and the role of determining the income-distribution to the long-term.
- But, even in the long-term, the level of income may be dependent on investment,
  - because mechanisms for attaining full employment is not so established, and
  - because the principle of effective demand itself is regarded as relevant in the long-term

The Principle of Effective Demand in the Pasinetti Theorem

- The share of capitalists' capital, $\pi = K_c/K$, is assumed constant. $\Rightarrow \pi = P_c/P$.
- When investment, I, is given, P is determined to be I/s_c. A proportion of it, πP, is gained by capitalists and the residual, $(1-\pi)P$, is gained by workers, i.e. $P_c = \pi P$ and $P_w = (1-\pi)P$.
- Out of the profit, $s_c P_c + s_w P_w$ is saved, which must be equal to $I - s_w W$, where W is the total wage. This relation determines the wage as

$$W = I\left(\frac{1-\pi}{s_w} - \frac{1-\pi}{s_c}\right).$$

- Since P and W is determined by I, the total income Y is also determined as

$$Y = I\left(\frac{1-\pi}{s_w} + \frac{\pi}{s_c}\right).$$

Income Distribution

- The share of the profit in the income becomes

$$\frac{P}{Y} = \frac{s_w}{\pi s_w + (1-\pi)s_c} \tag{3}$$

- The share of the wage in income is

$$\frac{W}{Y} = \frac{(1-\pi)(s_c - s_w)}{\pi s_w + (1-\pi)s_c}.$$

- Those shares are independent of I, and dependent on s_w.
- When I increases, P increases, but Y increases proportionately, so the share P/Y does not change. The income distribution is determined solely by s_c, s_w and π, and not affected by I nor g.

The Capital/Output Ratio and the Share of Capitalist' Capital

- The above results are dependent on the assumption of constancy of π.
- As is pointed out by Pasinetti (1974, p.130),

$$\pi = \frac{s_c(g\kappa - s_w)}{(s_c - s_w)g\kappa}, \tag{4}$$

where κ represents capital/output ratio. Substituting this into (3), we obtain

$$\frac{P}{Y} = \frac{g\kappa}{s_c}$$

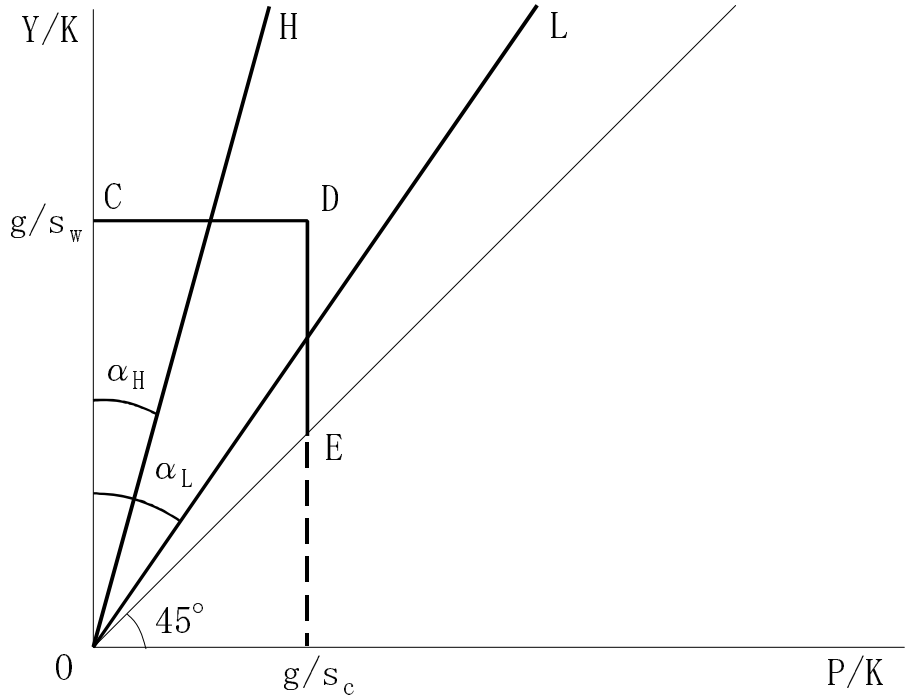
This is equivalent to the original (1), taking $I/Y = g\kappa$ into account, and it seems to show P/Y is dependent only on g, κ and s_c, and independent of s_w.

What is Dependent on What?

- Equation (4) reveals that when s_c and s_w are given, either π or κ is dependent on g;
  - π is uniquely determined by g when κ is fixed, and
  - κ is uniquely determined by g when π is fixed.
- When κ is fixed, π will be so adjusted that P/Y is not dependent on s_w nor π.
- When π is fixed, κ will be so adjusted that $g\kappa$ is kept constant, and that P/Y is dependent only on s_c, s_w and π.
- Which is fixed π or κ cannot be determined *a priori*; any of them can change when the long-term g changes.

Neo-Classical Case (1)

- Meade (1966) presented a geometric taxonomy to illustrate what divides the Pasinetti case from the 'anti-Pasinetti' case.



- OL (representing a high value for α) intersects DE, which represents the Pasinetti case. OH (representing a low α) intersects CD, which represents the anti-Pasinetti case.

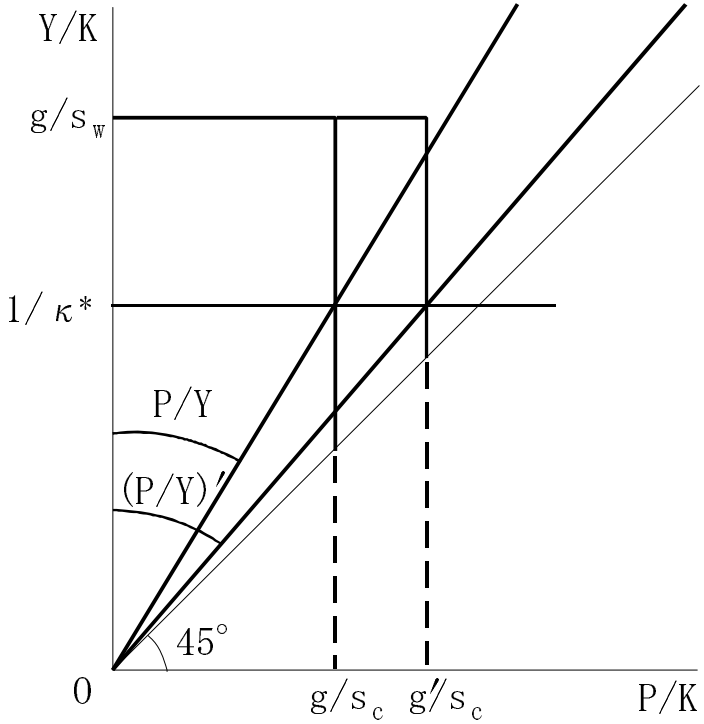
Neo-Classical Case (2)

- As Pasinetti (1974) pointed out, the anti-Pasinetti case, where capitalists disappear because workers' propensity to save is too high, is of no interest.
- Meade's diagram is important insofar as it illustrates what is given and what is determined internally in the Neo-Classical framework.
- In the Neo-Classical framework, which assumes the marginal productivity theory of income distribution, the income distribution is determined by technological parameters in the production function. When a Cobb-Douglas production function $Y = AK^{\alpha}L^{1-\alpha}$ is assumed, the share of profit in income is determined to be α, and then π is accordingly determined as

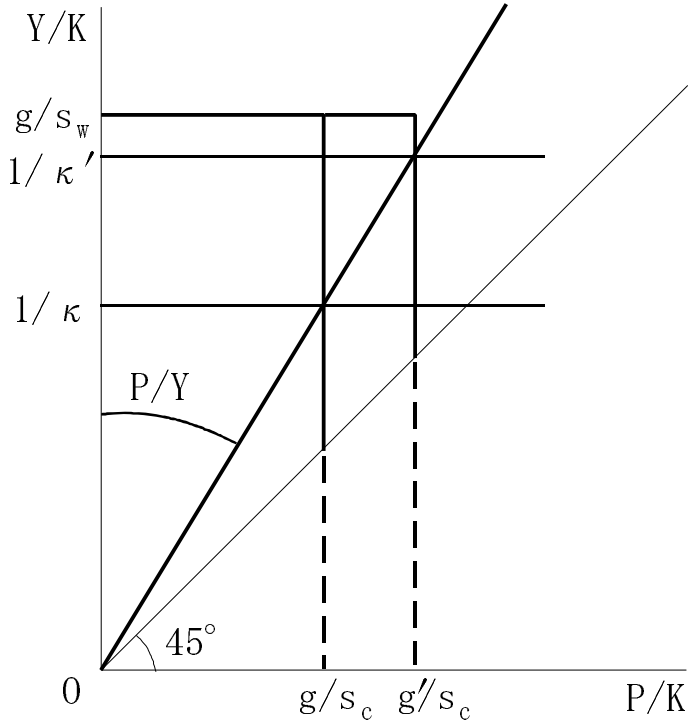
$$\pi = \frac{\alpha s_c - s_w}{\alpha(s_c - s_w)},$$

which results from (3) when P/Y is tied to α. κ is also determined by the equation (4).

Pasinetti Theorem in Meade's Diagram

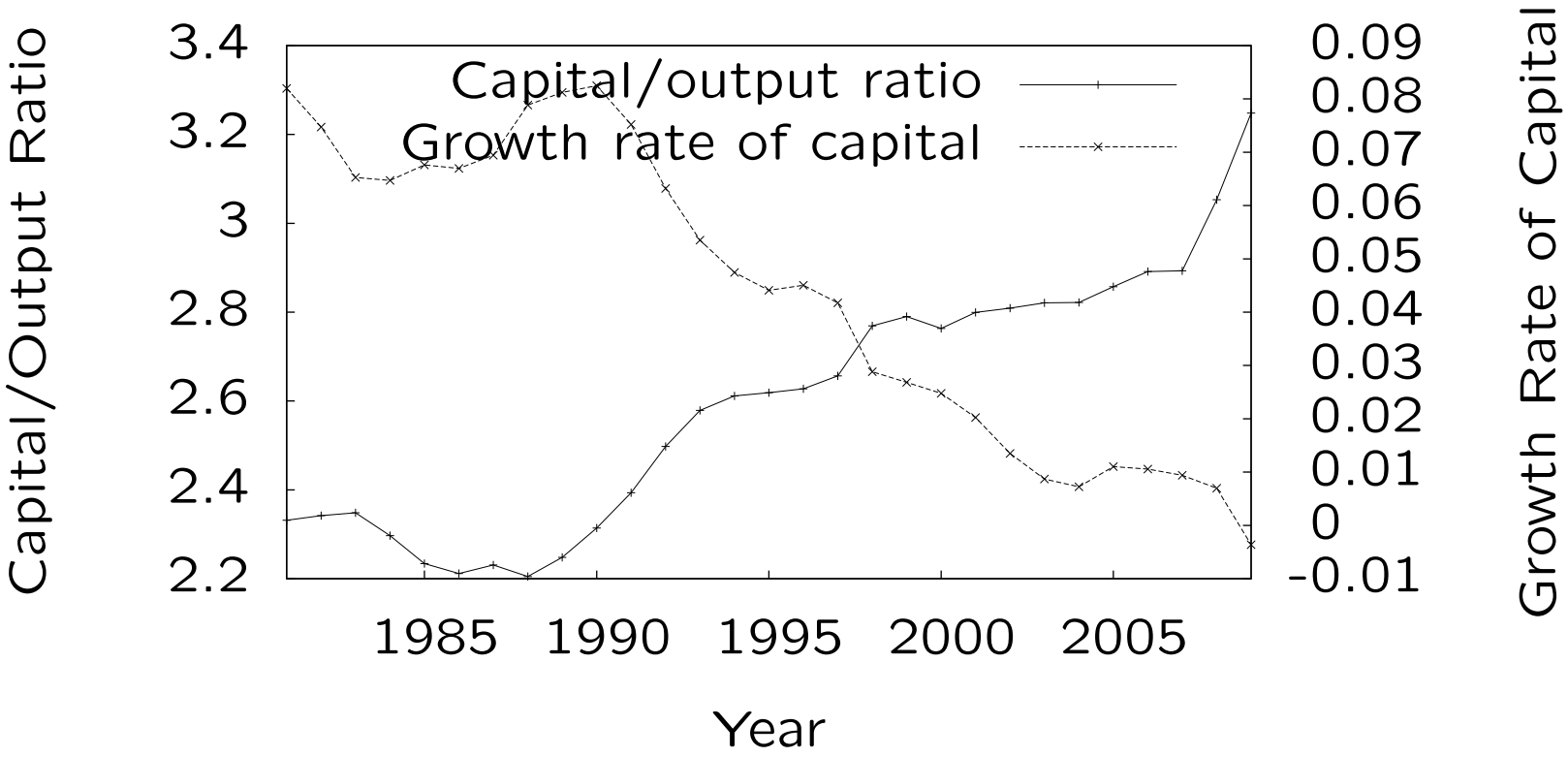


(a) κ=const.



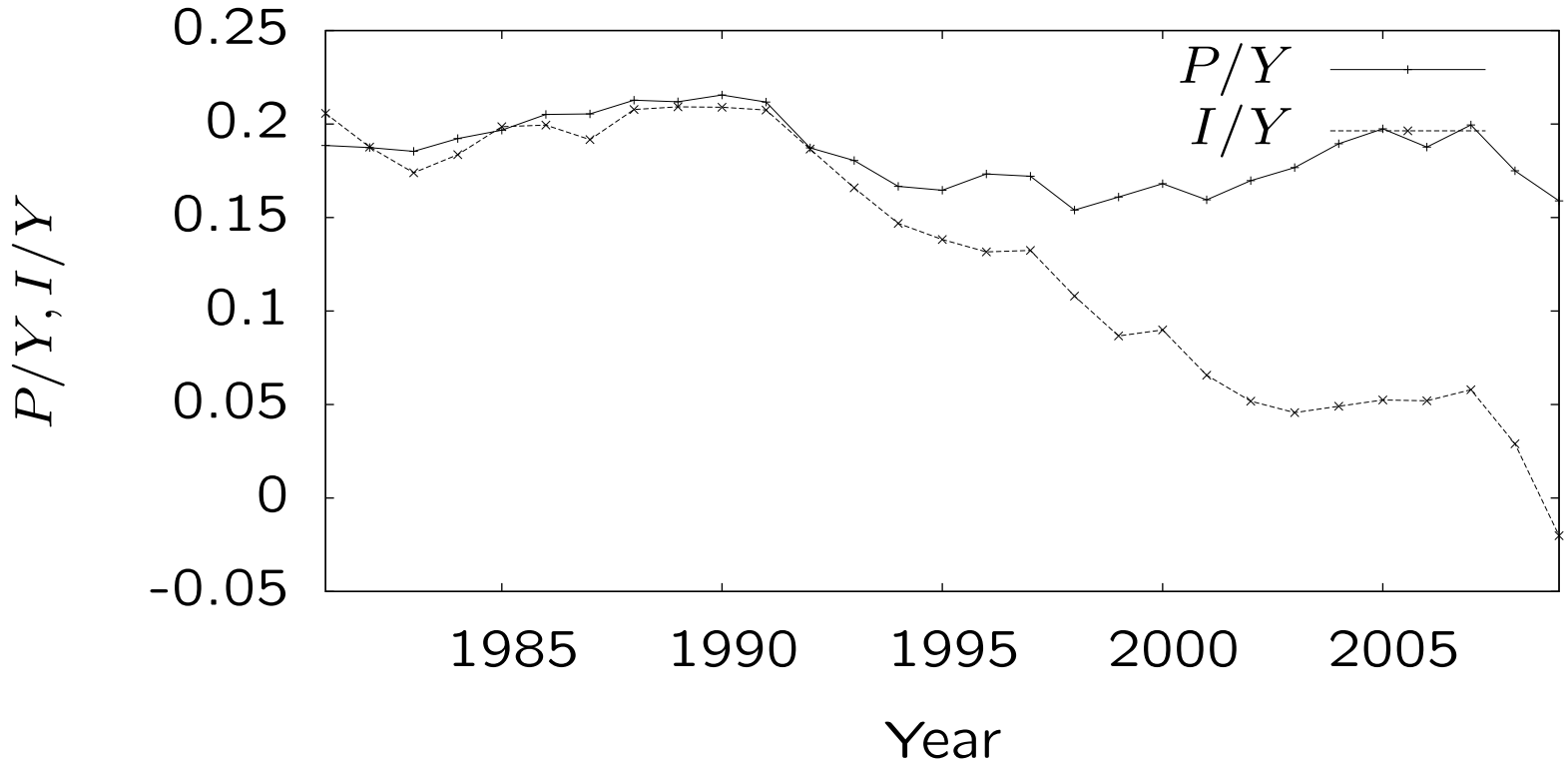
(b) π=const.

Development of Capital/Output Ratio and Growth Rate of Capital in Japan



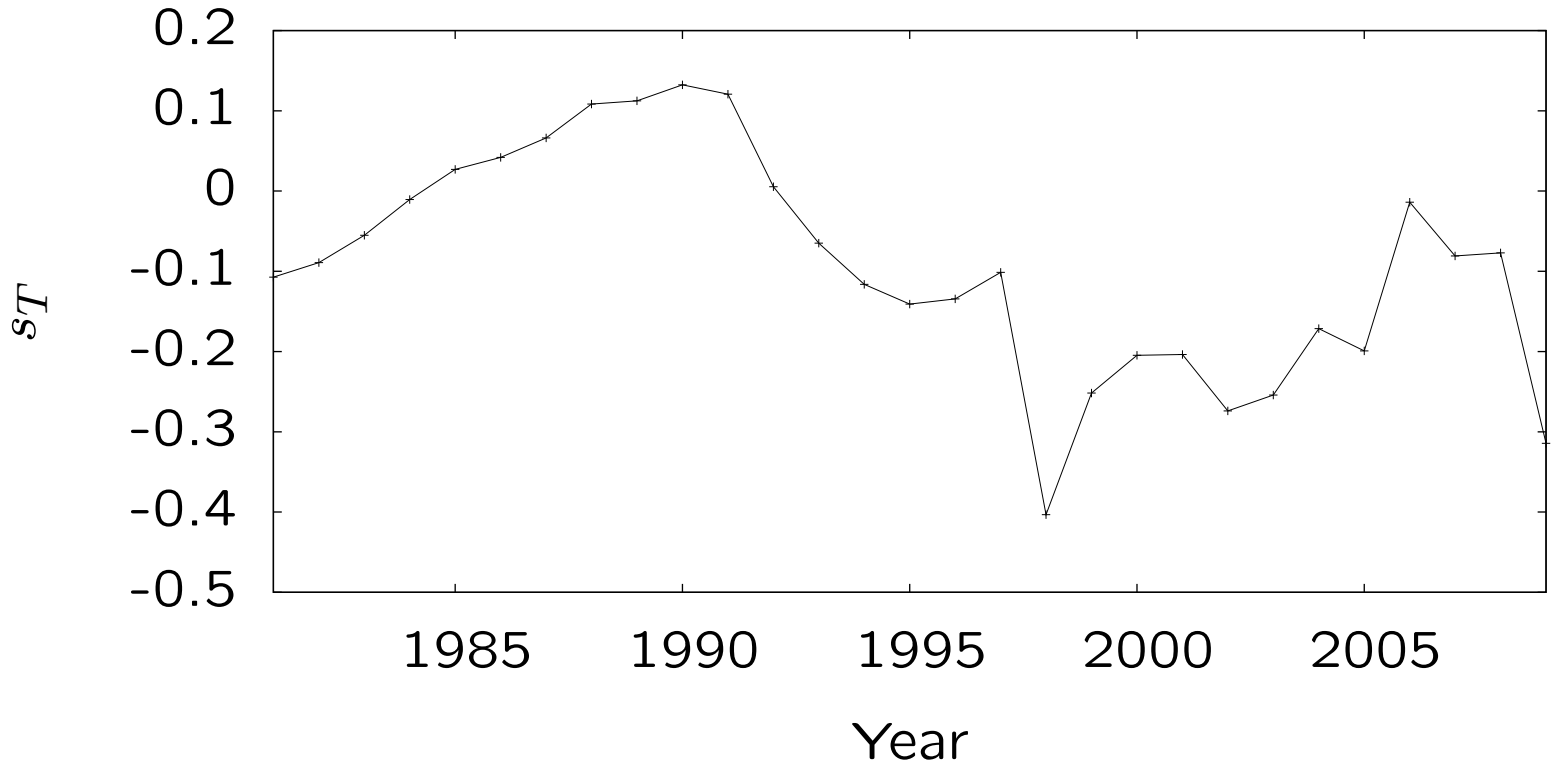
National Account of Japan. Capital/output ratio is fixed assets divided by net domestic products. Growth rate of capital is net investment divided by fixed assets.

Development of P/Y and I/Y in Japan



National Account of Japan. P is 'operating surplus'. Y is net domestic product. I is the sum of net fixed capital formation, changes in inventories, and exports minus imports.

The Government's Propensity to Save



National Account of Japan. s_T is primary balance divided by the revenue for the government sector, which includes tax revenue, social security revenue and net interest received.

Public Sector and the Pasinetti Theorem

- According to Pasinetti (1989), when the public sector is taken into account, s_c should be replaced by s_c', which is equal to

$$s_c(1-t_p) + s_T \frac{t_p + t_i(1-s_c)(1-t_p)}{1-t_i(1-s_T)}$$

  where t_p is the tax rate for profits, t_i is the tax rate for consumption, and s_T is the government's propensity to save.
- s_T has declined, but considering the present levels of tax rate, the decline in s_T by about 0.4 at the maximum cannot explain the descrepancy of P/Y and I/Y, which shows s_c' has decreased by about 0.7.
- That means s_c itself has decreased during this period. However, it is difficult to find facts corresponding to the decrease in s_c.

Conclusions

- In Pasinetti's framework, there is a possibility that the principle of multiplier still has a power to determine the income level even in the long-run. This is the case when π is constant.
- When κ is thought to be constant and π is to be adjusted, the principle of multiplier determines solely the income distribution.
- In fact, κ has increased when g has decreased in the period as long as 20 years.
- Income distribution is actually influenced significantly by the change in s_c and s_T.
- The government policy to spend more money seems to have offset the effect of the decrease in investment and to have had an effect of keeping the profit share at high levels.
- The aim of the theory of distribution is to identify what is the decisive factor for determining the shares of profits and wages. We can find no evidence that investment is the decisive factor from our recent experience.

References

- Bortis, H. (1993), 'Notes on Cambridge Equation', *Journal of Post Keynesian Economics*, **16**, 105-126.
- Kaldor, N. (1956), 'Alternative Theories of Distribution', *Review of Economic Studies*, **23**, 83-100.
- Meade, J. E. (1963), 'Outcome of the Pasinetti-Process: a Note', *Economic Journal*, **76**, 161-165.
- Pasinetti, L. L. (1962), 'Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth', *Review of Economic Studies*, **29**, 267-279.
- Pasinetti, L. L. (1974), *Growth and Income Distribution: Essays in Economic Theory*, Cambridge: Cambridge University Press.
- Pasinetti, L. L. (1989), 'Ricardian debt/taxation equivalence in the Kaldor theory of profits and income distribution', *Cambridge Journal of Economics*, **13**, 25-36.