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# The social reproduction of labour and macro theory: A compelling and fruitful conjunction

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#### Abstract:

The thesis advanced in this paper is that like class and technical change, gender and the social reproduction of labour routinely shape demand formation and/or the supply side of the economy — and as such, reference to the gendered social reproduction of labour should be more routinely incorporated into macro-theoretic analysis. The argument is developed with reference to two familiar issues in heterodox macrodynamics: reconciliation of the equilibrium and natural rates of growth; and the relationship between distribution and growth. Using an existing feminist macro model as a point of departure, it is shown that proper account of the social reproduction of labour and its gendered character creates important new insights into both the processes by which the equilibrium and natural rates of growth might be equalized, and the underlying character (wage- versus profit-led) of the relationship between distribution and growth.

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The point of departure for this paper is the recent claim by Folbre (2023), that feminist economics should permeate all micro- and macro-theoretic arguments because of the breadth and generality of its insights into matters pertaining to both structure and agency in the economic sphere. Among the questions this claim raises are: what, henceforth, should macro theory look like? And how would macro theory benefit from greater permeation by feminist economics?

One place to begin addressing these questions is with the role of (gendered) care-giving and the social reproduction of labour (see also Heintz and Folbre, 2022). Heterodox macro models routinely feature class and technical change as associated topics of analysis. It could therefore be argued by analogy that they should also routinely feature gender and the social reproduction of labour: a source of social stratification that, in turn, bears on the efficiency of an input into the

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production of marketed goods and services. The possibility exists that like class and technical change, gender and the social reproduction of labour routinely shape demand formation and/or the supply side of the economy in non-negligible ways. Pursuing this line of inquiry constitutes an important project for economies at all stages of development, given the ubiquity of macro theory as a tool of analysis (at least in the middle-income and advanced economy contexts) and the ubiquity of the social reproduction of labour (and its gendered nature) at *all* levels of development. It can be thought of as particularly important in the context of developing economies, where women in low-income households are simultaneously dependent on (informal) self-employment as a source of income, and constrained from developing such activity into small businesses by (disproportional) involvement in unpaid domestic care giving (Vasudevan and Raghavendra, 2022).

The arguments above suggest that seeking to more routinely integrate the social reproduction of labour into macro theory is a *compelling* project. That it is *fruitful* is, to a substantial extent, demonstrated by several contributions to the existing feminist macro literature (see, in particular, Braunstein et al., 2011; Onaran et al., 2022a).<sup>1</sup> Rather than simply surveying this literature, however, the purpose of this paper is to embellish its claim that the social reproduction of labour and macro theory constitute a fruitful conjunction. This is done by using the model of Braunstein et al. (2011) as a point of departure. It is shown that this model, with suitable extensions, demonstrates the potential for aspects of the social reproduction of labour to bring fresh insights into time-worn debates in heterodox macroeconomics, such as the reconciliation of the actual and natural rates of growth, and the relationship between distribution and growth.

The remainder of the paper is organized as follows. Section 1 outlines key features of the Braunstein et al. (2011) model. Sections 2 and 3 then demonstrate the potential capacity of this model — and in particular, its emphasis on unpaid care giving in the social reproduction of labour — to 'solve' the first Harrod problem and further elucidate the relationship between distribution and growth. Section 4 offers some conclusions.

#### 1. A point of departure: the Braunstein et al. (2011) model

The purpose of this section is to outline structural features of the Braunstein et al. (2011) model that contribute directly to the project outlined in the introduction.<sup>2</sup> The focus throughout will be on the macro-theoretic effects of *human capacities*, defined as "features that make human beings more economically effective (such as emotional maturity, patience, self-confidence, and the ability to work well with others, as well as standard human capital measures such as skills and education)" (Braunstein et al., 2011, pp. 9-10), or simply "individual attributes that improve productive contributions" (Heintz and Folbre, 2022, p. 150). So defined, human capacities are acquired rather than innate, and can be considered equivalent to human capital *broadly defined* (as acquired attributes of individuals that enhance their productivity). They arise from a variety of sources including *care services* (Elson, 1995) that may be marketed (such as the services of a day spa) or result from unpaid care in the home (such as care for an elderly relative). The latter is closely related to the Marxist-feminist notion of the social reproduction of labour (Folbre, 1994).

<sup>&</sup>lt;sup>1</sup> See also Seguino (2020) and Blecker and Braunstein (2022) for more general overviews of the contributions of feminists economics to macroeconomic theory.

<sup>&</sup>lt;sup>2</sup> See Braunstein et al. (2020, 2021), Onaran et al. (2022b, 2023), and Oyvat and Onaran (2022) for empirical counterparts to the theoretical model outlined in this section.

Finally, and not least because of their association with unpaid care in the home, human capacities are accumulated through processes that are gendered (Braunstein et al., 2011, p. 8).

#### 1.1. A brief digression on the demand side

Turning now to the Braunstein et al. (2011) model, it is on the demand side of this model that we encounter investment spending on marketed services that contribute to human capacities ( $H_c$ ). Total investment spending can therefore be written as:

$$I = I_K + I_{H_c} \tag{1}$$

where  $I_K$  denotes investment in fixed capital and:

$$I_{H_c} = I_{H_c} (o^e(\pi, u)) \quad , \qquad I'_{H_c} > 0$$
<sup>(2)</sup>

In equation (2),  $o^e$  denotes 'expected opportunities' for workers,  $\pi$  is the profit share of income and u is the rate of capacity utilization, so that  $o_{\pi}^e < 0$ ,  $o_{u}^e > 0$ . According to Braunstein et al. (2011), the *size* of  $I'_{H_c}$  depends on 'caring spirits', which are greater in altruistic than selfish societies. The key results of the original model emanate from this distinction.<sup>3</sup> For the purposes of this paper, however, we need only note that if follows from equation (1) that:

$$g = \theta g_K + (1 - \theta) g_{H_C} \tag{3}$$

where  $g = \frac{I}{K}$  denotes the rate of accumulation and  $\theta = \frac{K}{K+H_C}$  is the share of fixed capital (*K*) in total capital (fixed capital plus human capacities). The significance of this expression (together with those in equations (1) and (2)) will become apparent in sections 2 and 3.

#### 1.2. Social reproduction of labour and the supply side

The supply side of the Braunstein et al. (2011) model is where we encounter unpaid care-giving (the social reproduction of labour) in the household. This is modelled as:

$$H_c = H_c(f(u), m(u)) \tag{4}$$

In equation (4), m' > f' > 0: both male wages (m(u)) and female wages (f(u)) are increasing in economic activity, but men have more bargaining power due to gender segmentation of the labour market. Meanwhile,  $H_{c_m} < H_{c_f} < 0$ . Unpaid care-giving is decreasing in wages (male and female) and to greater extent for men, drawing attention to the gendered structure of the social reproduction of labour.

Drawing on equation (4), Braunstein et al. (2011) describe labour productivity (*Q*) as:

$$Q = Q[f(u), m(u), H_c(f(u), m(u))]$$
<sup>(5)</sup>

<sup>&</sup>lt;sup>3</sup> For example, the macroeconomic effects of raising female wages are shown to differ as between selfish and altruistic societies.

In equation (5),  $Q_f$ ,  $Q_m > 0$ , representing the process of classical induced, factor biased (CIFB) technical change: higher wages squeeze profits and so induce labour-saving technological change.  $Q_{H_c} > 0$ , meanwhile, captures the productivity-enhancing effect of unpaid care-giving in the home. As a result of equation (5), higher economic activity (u) and hence wages (f(u), m(u)) will have both a positive 'direct' effect on Q (as a result of CIFB technical change) and a negative 'indirect' effect on the same variable, by reducing the time devoted to the unpaid production of human capacities in the household.<sup>4</sup>

#### 2. Solving the first Harrod problem

Heterodox growth models typically produce results consistent with the first Harrod problem so that, unless by chance, we will observe inequality of the equilibrium and natural rates of growth:  $y \neq y_p$ , where y and  $y_p$  are the actual (equilibrium) and potential (natural) rates of growth, respectively. But  $y \neq y_p$  implies non-constancy of the employment rate, a *bounded* variable.<sup>5</sup> The extent to which this poses a problem varies with the level of development. The more the economy approximates a Lewis-type or 'dual' economy, the less we need be concerned with  $y \neq y_p$  and, in particular,  $y > y_p$  — because a rising employment rate will simply draw more labour into the formal 'industrialized' sector of the economy. Note, however, that in advanced and (some) middle income economies, the labour constraint on output may, at times, bind — either by limiting real activity, or by aggravating nominal (wage and price) dynamics as the labour market tightens. Even at lower levels of development, labour constraints may be problematic if there are structural obstacles to the reallocation of labour between formal and informal sectors.

One solution to this dilemma in heterodox macrodynamics is to propose auxiliary mechanisms that produce  $y = y_p$  without sacrificing the characteristics of the underlying growth model.<sup>6</sup> The suggestion here is that the Braunstein et al. (2011) model can contribute to this suite of mechanisms.

To see this, first recall equation (3). It follows from this expression that we can write:

$$y = y(g_K, g_{H_c}, \mathbf{Z})$$
(6)

where **Z** is a vector of influences on the dynamics of demand formation other than those associated with the rates of accumulation  $g_K$  and  $g_{H_c}$ . Deriving an expression for the potential rate of growth is, however, more complicated. For instance, there is no explicit production function in Braunstein et al. (2011) describing the *level* of potential output — although the information in equation (5) can be used to construct one of the (Leontieff) form:

<sup>&</sup>lt;sup>4</sup> Note that the short-run structure of the Braunstein et al. (2011) model, coupled with the fact that  $H_c$  is independent of  $I_{H_c}$  (because  $H_c$  is modelled exclusively in terms of labour inputs in equation (4)), means that care-giving has demandand supply-side effects that are independent of one another. Unpaid care-giving in the home affects  $H_c$  and hence Qwithout generating demand for output, while investment in marketed services that contribute to human capacities generates demand for output but without affecting  $H_c$  (and hence Q).

<sup>&</sup>lt;sup>5</sup> See the Appendix for formal demonstration of this claim.

<sup>&</sup>lt;sup>6</sup> For example, if a growth model is demand-led, the manner in which the first Harrod problem is 'solved' matters: the model can lose its demand-led character if  $y_p$ , determined independently of y on the supply side, becomes the sole driver of long-term growth.

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$$Y_p = min\left[\frac{K}{v}, N_{max}Q[f(u), m(u), H_c(f(u), m(u))]\right]$$
(7)

where  $Y_p$  denotes potential output, v is the full capacity capital-output ratio, and  $N_{max} = (1 - U_{min})L$  is the maximum level of employment that can be attained ( $U_{min}$  representing 'full employment' and L the total labour force). Assuming that the economy is ultimately labour constrained, it follows that:

$$Y_p = N_{max} Q[f(u), m(u), H_c(f(u), m(u))]$$
  

$$\Rightarrow Y_p = (1 - U_{min}) LQ[f(u), m(u), H_c(f(u), m(u))]$$
(8)

We can then write:

$$y_p = q(.) + n \tag{9}$$

although, as the specification of equation (9) suggests, the derivation of q(.) from the Q[.] function in (5) requires further thought — and in the long run, the stock of human capacities will be affected by the flow of investment in human capacities, necessitating the introduction of  $g_{H_c}$  into q(.) despite the independence of Q[.] from  $I_{H_c}$  in the short run.<sup>7</sup>

Nevertheless, it appears likely that *some* expression for q(.) such that  $q = q(g_{H_c}, \mathbf{X})$ , where  $\mathbf{X}$  is a vector of variables affecting q other than human capacities accumulation, can be derived from the Braunstein et al. (2011) model — so that we can (or should eventually be able to) write:

$$y_p = q(g_{H_c}, \mathbf{X}) + n \tag{10}$$

Recalling that:

$$y = y(g_K, g_{H_c}, \mathbf{Z}) \tag{6}$$

this means that human capacity accumulation (including, but not limited to, the results of unpaid labour in the home) contributes directly to both the demand-led actual rate of growth (in (6)) and the natural rate of growth (in (10)). The significance of this observation follows from the results of Serra (2021), who shows that variation in a variable similar  $g_{H_c}$  — specifically, the rate of accumulation of human capital narrowly defined (as skills and education) — can bring about the equality of y and  $y_p$ . The suggestion here, then, is that the Braunstein et al. (2011) model be thought of as a 'work in progress' extension of Serra (2021) that, with suitable amendment, shows how variation in the accumulation of human capacities — including activities associated with the gendered social reproduction of labour in the household — can solve the first Harrod problem.

#### 3. Wage-led steady-state growth via the supply side

The Braunstein et al. (2011) model may also yield new insights into the relationship between distribution and growth in heterodox macroeconomics, because it is implicitly suggestive of a

<sup>&</sup>lt;sup>7</sup> This problem is 'solved' in the neoclassical model of Heintz and Folbre (2022), but by treating  $H_c$  and  $g_{H_c}$  as exogenously given.

channel — unpaid care in the home — through which distribution may effect potential output and hence (with suitable long-run extension) the natural rate of growth. In this sense it is of a piece with Rada et al. (2021), who argue that even if the actual rate of growth is profit-led, the natural rate of growth will be wage-led if a profit squeeze induces CIFB technical change.<sup>8</sup> As Rada et al. (2021) show, the result of this conjunction is that profit-led medium run growth may turn wageled in the long-run. This result is illustrated in figure 1, where the north-east quadrant depicts a positive relationship between the profit share and the rate of growth (because the actual rate of growth is, by hypothesis, profit-led), the north-west quadrant illustrates the  $y = y_p$  condition for long-run, steady-state growth consistent with a constant rate of growth and the wage share of income ( $\omega$ ) that arises from CIFB technical change (according to which a rise in the wage share stimulates labour-saving technical change that increases productivity growth and hence potential

output growth), and finally, the south-east quadrant depicts the trade-off between the wage share and the profit share. An initial steady-state equilibrium is depicted at  $\omega^*$ ,  $\pi^*$ ,  $y^* = y_p^*$  where the distribution of income generates equivalency between the actual and potential rates of growth (given the endogeneity of both y and  $y_p$  to  $\omega = 1 - \pi$ ).

Suppose now that there is a change in responsiveness of growth to the profit share, depicted by the rotation of the y schedule in the north-east quadrant of figure 1, from  $y_1$  to  $y_2$ . The immediate consequence of this event will be that at  $\pi^*$ , the actual rate of growth is elevated to y', even as the natural rate of growth consistent with  $\omega^* = 1 - \pi^*$  remains unchanged at  $y_p^*$ . We now have  $y' > y_p^*$  which, according to Rada et al. (2021), will set in motion a 'reserve army effect': the rising employment rate associated with  $y' > y_p^*$  will increase the rate of growth of real wages above the rate of growth of productivity, causing the wage share of income to rise above  $\omega^*$ . This, in turn, will have two effects. First, the profit share will fall below  $\pi^*$  causing the actual rate of growth to decline below y'. Second, the rise in the wage share will induce CIFB technical change, that increases the rate of productivity growth and so increases the natural rate of growth above  $y_p^*$ . As the confluence of these events makes clear,  $y' > y_p^*$  induces adjustments that make for a simultaneous fall in y and rise in  $y_p$  — as a result of which equality of these growth rates will eventually be restored at  $y'' = y'_p$  in figure 1. Note that this outcome, consistent with a new and constant rate of employment, will shut down the reserve army mechanism responsible for raising the growth of real wages above the rate of growth of productivity. This development will, in turn, maintain constancy of the functional distribution of income at  $\omega' = 1 - \pi'$ . The outcome  $y'' = y'_p$ will therefore be maintained as a new steady-state equilibrium growth rate. Finally, note that the restoration of steady-state conditions at  $y'' = y'_p$  means that the new long-run rate of growth consistent with the higher wage share  $\omega'$  is *higher* that the original long run steady-state growth rate  $y^* = y_p^*$ . In other words, and despite the fact that the actual rate of growth is (by hypothesis) profit-led in the medium run, the long-run rate of growth is wage-led.

Consider now the links between this analysis and the Braunstein et al. (2011) model. According to Rada et al. (2021), any change in the functional distribution of income will affect steady-state growth through two different channels: a 'traditional' demand-side channel, as a result of which the actual rate of growth is affected; and a 'new' supply-side channel, as a result of

<sup>&</sup>lt;sup>8</sup> In what follows, we distinguish between wage- and profit-led growth for purposes of clarity when articulating the rudiments of the Rada et al. (2021) model. In developing economies, however, large sections of the population depend for their livelihoods on informal employment or self-employment, rather than formal waged employment (Blades et al., 2011). In this context, growth that responds positively to redistribution away from (formal sector) profits may be better understood as 'equality-led' or 'equity-led' rather than wage-led in the conventional sense of the term.

which the natural rate of growth is affected by CIFB technical change. The Braunstein et al. (2011) model — albeit it in short-run form — already nests these channels of adjustment, *but with additional nuances due to human capacities accumulation.* Hence, on the demand side, distribution affects the actual rate of growth through 'traditional' effects on consumption and investment in fixed capital. But distribution also affects demand formation and hence the actual rate of growth as a result of investment in human capacities. Hence, it follows from equations (1) and (2) that:

$$\frac{dI}{d\pi} = \frac{dI_K}{d\pi} + \frac{dI_{H_c}}{d\pi} = \frac{dI_K}{d\pi} + I'_{H_c} \left( o_\pi^\varepsilon + o_u^\varepsilon \frac{du}{d\pi} \right)$$
(11)

Note that even if  $\frac{dI_K}{d\pi}$ ,  $\frac{du}{d\pi} > 0$  (so that  $I'_{H_c} o_u^{\varepsilon} \frac{du}{d\pi} > 0$ ),  $I'_{H_c} o_{\pi}^{\varepsilon} < 0$  introduces ambiguity into the sign of the derivative in (11). In other words, consideration of the accumulation of human capacities through expenditures on marketed services can fundamentally affect the character of the demand regime — specifically, whether it is more likely wage- or profit-led.<sup>9</sup>

Meanwhile, on the supply side, distribution affects productivity (and hence potential output) both through 'traditional' effects on the technique of production (arising from CIFB technical change) *and* a second channel associated with the quantity of unpaid care-giving in the home (the social reproduction of labour). Hence it follows from equations (4), (5) and (8) that:

$$\frac{dY_p}{d\pi} = (1 - U_{min})L\left[Q_f\frac{du}{d\pi} + Q_m\frac{du}{d\pi} + Q_{H_c}\left(H_{c_f}f'\frac{du}{d\pi} + H_{c_m}m'\frac{du}{d\pi}\right)\right]$$
(12)

If we now assume that  $\frac{du}{d\pi} > 0$ , then  $Q_f, Q_m > 0$  means that the first two terms in brackets on the right-hand side of equation (12) (associated with the CIFB technical change channel) are positive. But because  $Q_{H_c}$ , f', m' > 0 whereas  $H_{c_m}$ ,  $H_{c_f} < 0$ , the third term in brackets on the righthand side of (12) is negative. The introduction of the social reproduction of labour into our analysis complicates the response of potential output to a redistribution of income. Note that if  $H_{C_m}$  and  $H_{C_f}$  are sufficiently large, the sign of the derivative in (12) may even be reversed as compared to the case where  $Q_{H_c} = 0$  (i.e., where the only effects of redistribution on the supply side operate via CIFB technical change in the sphere of production). In principle, then, a long-run version of the Braunstein et al. (2011) model could reverse the result in Rada et al. (2021), by causing both the actual and natural rates of growth to fall in response to a rising wage share when  $y > y_p$ , and so converge to a steady-state growth rate *below* the initial value  $y^* > y_p^*$  in figure 1.<sup>10</sup> This is not a mere theoretical possibility: if engagement in domestic unpaid care giving is of sufficient importance for the social reproduction of labour, attracting labour out of the household and into the sphere of production may well impair the creation of human capacities to an extent that, despite CIFB technical change, productivity growth diminishes. Finally, note the potential policy implications of this discussion. If the size of  $H_{C_m}$  and  $H_{C_f}$  impede the realization of productivity gains when the wage share rises, then public provision of care services that reduces the economy's dependence on unpaid care giving in the sphere of social reproduction can alleviate this problem, by decreasing the size of  $H_{C_m}$  and  $H_{C_f}$ .

<sup>&</sup>lt;sup>9</sup> See also Braunstein et al. (2011), who make this point clear.

<sup>&</sup>lt;sup>10</sup> Indeed, the model so-envisaged may not be stable at all – and will not be if, in addition to the dominance of  $H_{C_m}$  and  $H_{C_f}$  in (12), the effects of investment in human capacities are dominant in the long-run analog of (11), so that the actual rate of growth is increasing in the wage share.

The relationship between potential output and income distribution in (12) is further complicated by the gendered structure of both the paid labour market and the unpaid social reproduction of labour in the household, as reflected in m' < f' < 0 and  $H_{c_m} < H_{c_f} < 0$ . In other words, and quite apart from the effects on labour productivity and hence potential output of the social reproduction of labour *per se*, the extent to which the social reproduction of labour (and the paid labour market) are gendered will affect the relationship between income distribution and potential output. In short, gender as a source of social stratification *together with* consideration of the social reproduction of labour as a determinant of labour productivity (and hence potential output) affect the way in which the redistribution of income between social classes influences labour productivity and hence potential output.

The upshot of these considerations is that the Braunstein et al. (2011) model can be considered a 'work in progress' extension of Rada et al. (2021) that, with suitable modification to the long run, contributes to the nascent literature showing that the relationship between distribution and growth depends on supply- as well as demand-side adjustments — in this case, activities associated with the gendered social reproduction of labour in the household.

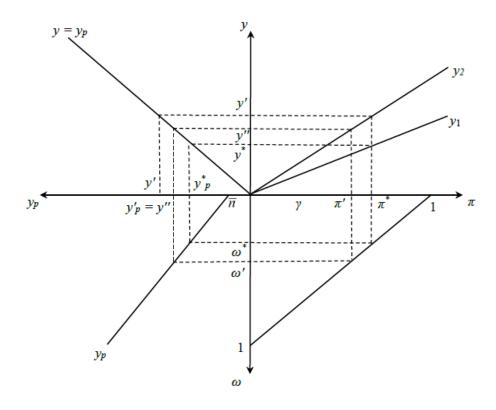


Figure 1 – Wage-led growth via the supply-side

#### 4. Conclusions

Gendered, unpaid care-giving in the home — together with investment in marketed care services that enhance human capacities — can be incorporated into macroeconomic models, as is demonstrated by Braunstein et al. (2011) and Onaran et al. (2022a). Building on features of the Braunstein et al. (2011) model, this paper has shown that such feminist macro theory is suggestive of a more general framework for further exploration of established topics in heterodox macro theory, including reconciliation of the equilibrium and natural rates of growth ('solution' of the first Harrod problem), and the debate over wage- versus profit-led growth. The results presented have been suggestive rather than conclusive. But they clearly identify a frontier for further research in macro theory and in so doing, provide an indication of the potential fruitfulness of seeking further integration of feminist economics into heterodox macro theory. One unequivocal conclusion that can be drawn from this analysis is that Folbre (2023) is right to argue that feminist economics should routinely permeate (micro- and) macro-theoretic arguments. Simply put, the breadth and generality of feminist insights is such that they promise to bear on topics and themes considered central to macroeconomics in non-trivial ways.

#### Appendix

#### The actual and natural rates of growth and the rate of employment

The relationship between inequality of the actual and natural rates of growth and the behaviour of the rate of employment is revealed as follows. First, note that:

$$Y = \frac{Y}{N}N$$

$$\Rightarrow y = q + e$$

$$\Rightarrow e = y - q$$
(13)

where *e* denotes the rate of growth of total employment and all other variables are as previously defined. Meanwhile, defining the rate of employment as  $\eta$ , we can write:

$$\eta = \frac{N}{L}$$

$$\Rightarrow \hat{\eta} = e - n \tag{14}$$

Substituting (13) into (14), we arrive at:

$$\hat{\eta} = y - q - n$$

or:

$$\dot{\eta} = \eta(y - q - n) = \eta(y - y_p) \tag{15}$$

What equation (15) reveals is that for any  $\eta > 0$  (that is, any economically meaningful value of  $\eta$ ),  $y \neq y_p \Leftrightarrow \dot{\eta} \neq 0$ . It is also clear from (15) that  $\frac{d\dot{\eta}}{d\eta} = y - y_p$ . But because the rate of employment is a bounded variable ( $0 \leq \eta \leq 1$ ), it cannot increase (decrease) at an increasing rate in the long run as this derivative implies it will if  $y \neq y_p$ . Instead, we must observe  $y = y_p$  and hence  $\dot{\eta} = 0$  in the steady state. But according to the first Harrod problem, this is precisely the outcome that will *not*, in general, be observed.

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