Marx's reproduction schemes and the Keynesian multiplier: a reply to Sardoni

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In a recent contribution to this journal, C. Sardoni takes issue with the identification by Trigg, in a 2006 publication, of a role for the Keynesian investment multiplier in Marx's schemes of reproduction. Indirectly, Sardoni also expresses his disagreement with Hartwig (by attributing one of his statements to Trigg). We appreciate the opportunity to defend our view against Sardoni's critique. This reply shows that a bridging point between Marx and Keynes can be established without recourse to microfoundations. As suggested by both Trigg, in 2006, and Hartwig, in 2004, the well known Harrod–Domar model of economic growth provides an interpretation of Marx's reproduction schemes that has the Keynesian multiplier as a constituent element. This note will further explore the assumptions underlying the interface between Marx and Keynes, in response to the challenging questions raised in Sardoni's contribution.

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JEL classifications: E11, E12

1. Introduction

C. Sardoni (2009, p. 162) is convinced that it is 'impossible to use the Keynesian multiplier within the Marxian schemes' because of the way microfoundations are defined by Marx and Keynes. For Sardoni, a bridging point between Marx and Keynes requires particular assumptions about how competition and the short-run supply curve are defined. We counter this argument in three stages. First, from a long-run macroeconomic perspective, we show how the Keynesian multiplier is nested in the Harrod–Domar interpretation of Marx's reproduction schemes. Second, we turn to the short-run multiplier developed by Keynes, and how this relates to the reproduction schemes. In the final part of this reply we discuss the role of microfoundations in this Marx–Keynes interface.

2. Harrod–Domar and the reproduction schemes

Sardoni (2009, p. 166) derives a Keynesian multiplier (see his equation 8) from a multi-sectoral model of Marx's reproduction schemes:

$$Y = \frac{1}{s}I \tag{1}$$

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where Y is money income, I is gross investment, and s is the propensity to save. This multiplier is 'quite similar' (Sardoni, 2009, p. 169) to that derived from Marx's schemes in Trigg (2006), the difference being that an average is taken of the consumption and savings of workers and capitalists. Hence there appears to be no substantive disagreement that a Keynesian multiplier can be derived from Marx's schemes; the argument is about how such a multiplier is applied.

Following Domar, it is possible to use this multiplier to derive a Keynesian model of macroeconomic growth (see Trigg, 2006, pp. 55–6). If we let σ represent the productivity of investment,

$$\sigma = \frac{dY}{I} \tag{2}$$

and from (1) let

$$dY = \frac{1}{s}dI \tag{3}$$

it can follow that

$$\frac{dY}{Y} = \frac{dI}{I} = s\sigma \tag{4}$$

Under the assumption of full capacity utilisation, this can be defined as a full employment balanced rate of growth, derived from Marx's reproduction schemes. On this basis, Marx has been described as the forerunner of macroeconomics, showing the conditions under which balanced growth can be established in a multi-sectoral framework.

Now this bridging point between Marx and Keynes can be derived without Sardoni's recourse to microfoundations. The model does not make any assumption about free competition. The reproduction schemes in *Capital*, Volume II, as an initial abstract starting point, are based on the assumption that prices are proportional to values. In both Marx's schemes and the Domar interpretation, there is no consideration of free competition and the tendency to uniform profitability that this would entail.

Sardoni may object to the assumption of full capacity utilisation in the Domar model, since his main objective is to establish an underemployment equilibrium that resembles the short-run model developed by Keynes. No claim has been made, however, that the model developed in Trigg (2006) is a model of Keynes; it is a model of Marx's reproduction schemes that incorporates a Keynesian multiplier. Nor is there any claim that this is a model of actual economic growth. The objective for Marx, and Domar, is to develop a benchmark that explores the difficult and extreme conditions required for balanced growth to be achieved. It is more concerned with how an economy *ought to* grow rather than how it *actually* grows (see Hartwig, 2004, p. 321). With an exclusive focus on the search for more realistic microfoundations, Sardoni detracts from the main point of Marx's macroeconomic contribution.

3. Keynes's structural multiplier

Thus far we have referred to this multiplier as 'Keynesian' but, following Hartwig (2004), we may take the argument one step further by exploring its resemblance to the structural multiplier identified in Keynes's *General Theory*. Writing at the time of the Great

Depression in the 1930s, a defining feature of Keynes's revolutionary approach to economic theory is his emphasis on the importance of production for generating employment. Production is disaggregated into two industries, producing capital goods and consumption goods. In Section IV, chapter 10, the multiplier is developed in relation to this two-sector production model:

> The discussion has been carried on, so far, on the basis of a change in aggregate investment which has been foreseen sufficiently in advance for the consumption-goods industries to advance *pari passu* with the capital-goods industries... (Keynes, 1973, p. 122)

Firms in the consumption goods industries are able to anticipate the expansion of the capital goods sector correctly. Proportionality is hence assumed between the two industries, as reflected in Keynes's 'structural multiplier', which can now be derived.

Since $Y = C + I$, with C representing total consumption expenditures, the Keynesian multiplier (1) can be re-expressed as

$$C + I = \frac{1}{s}I \qquad (5)$$

Hence, since $s = 1 - c$, where c is the propensity to consume,

$$C = \frac{c}{1 - c}I \qquad (6)$$

The structural multiplier $c/1-c$ provides a vehicle for firms in the consumption goods industries (producing C) to anticipate how much demand for consumption goods a certain value added in the investment goods industries (I)—correctly foreseen—will generate. Now although this multiplier is established for one (short-run) production period in which there is excess capacity, it anticipates the output of capital goods in the next production period, and the capacity generated by these goods. The short-run model points towards its development into a long-run model of proportional economic growth, as developed from Keynes's starting point by Harrod and Domar.[1] There is, therefore, a bridging point between Keynes's short-run structural multiplier and Marx's reproduction schemes.

4. Microfoundations

For Sardoni, it is necessary to specify particular microfoundations for a bridging point between Marx and Keynes to be established. He argues that the microfoundations advocated by Marx and Keynes are either too far apart or too close to each other. On the one hand, Marx and Keynes differ in their assumptions about the slope of the supply curve. Keynes, being a Marshallian, assumes increasing marginal cost and hence an upward-sloped supply curve; Marx assumes constant variable costs.[2] On the other hand they both assume competitive markets in which firms are price-takers. Hence, since Marx assumes constant returns and free competition there cannot be an underemployment equilibrium. Firms maximise their profits to produce as much as they can. With production pushed to full capacity, there can be no room for the multiplier. The multiplier only has a role to play

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[1] Hartwig (2004, p. 322) shows how the structural multiplier is embodied in the growth model developed by Harrod (1939); this multiplier is related to the alternative Domar variant in Trigg (2006), pp. 15–16, 55–6.
[2] Although Sardoni admits that 'Marx never made a clear and explicit hypothesis of short-period non-decreasing returns' (Sardoni, 2009, p. 166, fn. 2), he attributes exactly this hypothesis to Marx.

in the underemployment equilibrium established by Keynes under decreasing returns and perfect competition—or alternatively for Sardoni under more realistic assumptions of constant returns and imperfect competition, as proposed by Kalecki.

We take issue with Sardoni's notion of competition and price-taking, as well as with his conclusion that 'underemployment equilibria' are impossible in Marx. Sardoni (2009) does not explain in detail what he associates with the terms 'free' and 'imperfect competition', so we draw on his 1987 book. There, he attributes the notion of 'free competition' to Marx and explains what this entails: 'many relatively small firms unable to influence the price at which commodities are sold and no barriers or obstacles to the entry of new firms in any industry' (Sardoni, 1987, p. 44). To Keynes he attributes the concept of 'perfect competition' (Sardoni, 1987, p. 102, n. 3). This, Sardoni explains, means that the demand for the output of an individual firm is perfectly elastic. If we ask what the differences are between 'free' and 'perfect competition', Sardoni (1987, p. 116) tells us there are not really any because 'free competition' also entails perfectly elastic demand curves. Sardoni (1987, pp. 121–2) contrasts the imperfect competition assumption of Kalecki with 'Marx and Keynes who assumed that the prevailing market form was competition'.

Now, contrary to Sardoni, it can be argued that neither Keynes nor Marx assumed that firms face perfectly elastic demand. In fact, to suggest that Keynes and Marx did assume perfectly elastic demand would contradict the idea that entrepreneurs have to plan their supply quantities under uncertainty before bringing them to the market. For Sardoni, the nexus between money and uncertainty established by Keynes is the ultimate reason for his critique of Say's Law. With money being a means to cope with uncertainty, money income need not be spent on either consumption or investment goods. Therefore, entrepreneurs have to form *ex ante* expectations about the level of demand. They will not produce more than they expect will be demanded. The resulting output level need not imply full employment of labour. Sardoni (1987, p. 3) presents Marx as a forerunner of Keynes in this regard.

But, as is well known, when demand is perfectly elastic, entrepreneurs will expect to sell *any* amount of goods at a given price. They do not need to estimate the state of demand *ex ante*. Therefore, as Casarosa (1981, p. 192) argued, the idea of entrepreneurs forming *ex ante* expectations concerning demand is 'completely incompatible with the theory of the firm operating in an atomistic (let alone perfectly competitive) market'. But neither Keynes nor Marx—who were both concerned with the real world (we agree with Sardoni, 1987, pp. 131–43, on that)—had such firms in mind. In their theories, firms are not 'atomistic', but also not powerful enough to dictate the price. They have to form expectations about the price for their products that the market will accept, and about the market share that might be attributable to them (cf. also Torr, 1984, p. 939). Chick (1983, pp. 24–6) points out that price-taking is impossible, even for the small firm, under uncertainty. In Chick (1992) she proposes an approach in which small firms are modelled without price-taking. This resembles Kahn's (1989, pp. 12–13) notion of 'polypoly', where there are many small firms in a market, but differences in market price may nevertheless persist over an appreciable period of time. Now what does this mean for Sardoni's critique of our attempts to reconcile the multiplier with Marx's reproduction schemes? Sardoni's conclusion that firms always produce up to capacity in Marx was based on the assumptions of perfectly elastic demand and price-taking. If we drop these assumptions there is ample scope for 'underemployment equilibria', further undermining the possibility that the actual economy can achieve the Marx–Domar full employment growth path.

It might also be suggested that the notion of 'underemployment equilibrium' in Sardoni needs clarification. According to Sardoni, Marx's theory implies that firms tend to produce at full capacity. Episodes of production at full capacity are abruptly brought to an end by recurrent overproduction crises. It lies in the nature of a crisis, however, that it is not permanent. Therefore, in Sardoni's view, Marx presents something of a business cycle theory. Keynes, on the other hand, presents an equilibrium theory: he derives a 'centre of gravitation' (Sardoni, 1987, p. 9), which is characterised by unemployment.

In our view, this juxtaposition is artificial. In the *General Theory*, Keynes acknowledges that his equilibrium is 'shifting' (Keynes, 1973, p. 293). He has a whole chapter (chapter 22) on the business cycle. Marx, on the other hand, introduces the notion of the 'reserve army of the unemployed'; and Sardoni (2009, p. 166) admits that 'production at full capacity' does not imply full employment. So both Marx and Keynes saw the economy departing from centres of attraction that involve unemployment. Where is the big difference? Does Sardoni think that the centre of attraction comes along with full utilisation of technical capacities in Marx but not in Keynes? Sardoni (1987, p. 54) seems to confirm this conjecture, but we were unable to find an elaboration in Sardoni of why Keynes should have thought that entrepreneurs systematically build up excess capacities. Rather, it seems reasonable to assume that for both Keynes and Marx firms operate at normal capacity utilisation, on average, over good and bad times.[1] This is not the same as full capacity utilisation. So, again, there is scope for multiplier reactions in the interface between Marx and Keynes.

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[1] Kurz (1990A, 1990B) and Garegnani (1992) in fact argue that this was Marx's assumption.