CAPITAL IN THE TWENTY-FIRST CENTURY: DIFFERENT VIEWS ON THOMAS PIKETTY'S HYPOTHESES

PDF STRYDOM

Abstract

Capital in the Twenty-First Century is an extensive exposition on unequal income distribution between labour and capital. We show that its hypotheses are valid within a special case version of economic growth theory. The alternative is to analyse distribution in terms of a general economic growth framework. This emphasises the long-term trend in the price of capital goods as well as the importance of non-neutral technological progress. Factor substitution features prominently in explaining distribution patterns. The source of unequal distribution derives from labour as opposed from capital and the proposed global tax on capital appears to be an ineffective corrective measure.

JEL Classification: O40, G25

Keywords: Income distribution, Economic growth, production function

1. INTRODUCTION

Capital in the Twenty-First Century by Thomas Piketty (2014) addresses unequal income distribution patterns in economic history since the Industrial Revolution. It claims that the unequal distribution pattern that favours capital is likely to gain momentum in the future. There is no corrective mechanism to address this unfavourable condition. The author proposes a globally coordinated tax on capital as an effective interventionist measure. The exposition follows a systematic application of economic growth theory. It could easily be demonstrated that the unstable distribution pattern predicted by the author as well as the distribution law, are valid under special conditions that are well documented in growth theory.

If one applies a general economic growth model that satisfies a variable elasticity of substitution between the factors of production it follows that efficiency gains in capital production encourages large scale substitution of capital for labour while technological progress prevents capital from suffering diminishing returns as capital becomes relatively cheap. This outcome is in accordance with the downward trend in the relative price of capital goods that has been observed in many countries. This trend started gaining momentum since the 1980s and has been overlooked by the author. We consider a general, as opposed to a special case growth exposition while taking cognisance of the evidence regarding the declining relative price of capital goods and challenge the Piketty hypothesis regarding an unstable distribution pattern that is blamed on capital.

Although this paper concentrates on the analytical features of income distribution patterns we cannot overlook the many complaints about the data and measurement problems that have been raised in the literature regarding *Capital in the Twenty-First Century*. Giles (2014) launched an extensive critical reaction in the *London Financial Times* regarding data sources, technical data errors, data construction errors and omissions in the data. Similarly Rognlie (2015) raised concerns regarding the use of gross versus net variables. The typical distribution pattern reported by Piketty

appears to be evident only when capital is measured in gross terms. His main criticism is that housing, as a component of Piketty's capital concept, is distorting the capital income share pattern. It is claimed that the rising trend in capital's share after 1948 comes primarily from housing. In view of the housing bubble prior to the financial crisis of 2007 one could add that timing is of prime importance in considering the distorting effect of housing on capital. Moreover, the widely-spread ownership distribution of housing complicates its inclusion in income distribution issues.

Weil (2015) criticised the exclusion of human capital in measuring capital. Moreover, the calculation of capital in terms of market and tradable values of assets appears to be problematic. Timing is important, particularly during times when markets are volatile. The value of unlisted assets is open to various interpretations and complicates the computation of capital.

An important data problem in the presentation of unequal income is the presence of high incomes within the class of so-called Superstars. Although there is a connection between capital and the earnings of certain Superstars, particularly CEOs, these income categories are better classified under the heading of salaries and wages, as argued by Solow (2014).

Auerbach and Hasset (2015) criticised the exclusion of risk elements in the calculation of interest. They showed how Piketty's income distribution patterns change if the calculation of the rate of interest is adjusted for risk.

The paper is organised as follows. The following section demonstrates the validity of Piketty's distribution law within the special case of fixed factor proportions in production. The third section derives economic growth conditions within a general economic growth framework that allows for variable returns to scale and a variable elasticity of substitution between the factors of production. This renders our exposition independent of fixed ratios in terms of factor shares. Moreover, the variable elasticity of substitution opens the possibility of non-neutral technological progress that accommodates the empirical evidence regarding the global declining trend in the price of capital goods. This evidence has been overlooked by Piketty. The policy proposals of this analysis are analysed in section four. It is maintained that, as opposed to Piketty's hypothesis, the source of unequal income distribution is associated with the labour market. The globally coordinated tax proposal loses validity. Policies that are aimed at human capital and skills development as well as labour market reforms are likely to be effective in correcting the unequal distribution pattern by improving the bargaining power of labour in terms of quality human capital.

2. ECONOMIC GROWTH WITH FIXED FACTOR PROPORTIONS

The capital-output ratio (k/y) features prominently in Piketty's analysis since he argued that this ratio, which has long been regarded as a constant parameter, is likely to rise in the future. In South Africa the ratio equalled 2.9 in 1968 and it obtained its highest value of 3.5 in 1992 and then declined to 2.7 in 2014. His hypothesis is that this ratio is likely to rise in the future because of a slowdown in productivity as well as in population growth. This will have a profound effect on income distribution patterns as falling growth rates will favour capital's income share. The hypothesis that the k/y ratio is likely to rise without bound is usually associated with restrictive assumptions that are well known in the theory of economic growth.

In order to demonstrate this, we consider a general production function where y denotes units of output of a single commodity produced by two factors of production capital (k) and labour (ℓ) in terms of variable factor proportions i.e.

$y = f(k,\ell); k, \ell > 0$

Output growth is defined in terms of the growth rates of the two factors of production where, for simplicity, we do not consider technological progress, which in itself is a growth factor. We will return to technological progress later on. In terms of our assumptions, the percentage change in income is described by the following expression.

$dy/y = (f_k k/y)dk/k + (f_\ell \ell/y)d\ell/\ell,$

where f_k and f_ℓ denote the corresponding marginal products.

Adding the well-known capital accumulation condition but excluding capital consumption renders the percentage growth rate in capital as:

$dk/k = sy/k = i/k,$ where s denotes the saving rate and i investment. It is clear that Piketty's formulation of economic growth is merely a special case of a framework with two factors of production that allows variable factor proportions, namely

$dk/k = sy/k = s/\beta$, where β denotes k/y.

We extend this exposition by considering a growth framework with fixed factor proportions where we accommodate the hypothesis of an increase in k/y without bound. Consider the following production function that satisfies fixed factor proportions.

$y = (1/\beta)k; \beta > 0$

The marginal product is positive but there are no diminishing returns, moreover the following condition holds

$dy/y = dk/k.$

If we introduce the capital accumulation condition as proposed in growth economics without capital consumption i.e. $dk = i = sy$ we obtain

$dy/y = s/\beta,$ which is equivalent to Piketty's formulation where g denotes the real income growth rate i.e.

$g = s/\beta.$

From this exposition it is evident that Piketty's result is associated with a special case in growth economics as has also been confirmed by Blume and Sargent (2015). Moreover, it excludes capital consumption. The Piketty result is in fact matching the so-called demand-side growth models with fixed factor proportions in production and without diminishing returns. Following De Roos and Schouten (1960) we can link this outcome with that of a Harrod (1939) growth model where the equilibrium capacity growth (G_c) is defined as: $G_c = s/\beta$.

The Harrod-type model satisfies full capacity equilibrium growth when $G_c = G_n$ where G_n denotes population growth. The model has an unstable equilibrium solution which could be summarised as follows.

$G_c > G_n$: which represents a condition of capital redundancy or secular stagnation

$G_c = G_n$: which denotes full capacity growth

$G_c < G_n$: denoting capital shortage or secular inflation.

These results can be translated into the Piketty notation to obtain

$r > g$ corresponds to $G_c > G_n$ (capital redundancy or secular stagnation)

$r < g$ corresponds to $G_c < G_n$ (capital shortage or secular inflation)

Piketty's exposition isolates $r > g$ with r the average real return on capital and g the real income growth rate, as above. As has been discussed in great detail by Hicks (1949), this theoretical framework has an unstable equilibrium solution from which it is likely to explode, following an exogenous shock. This is known as Harrod's knife-edge equilibrium. This outcome follows from the conditions imposed by fixed factor proportions that exclude adjustment processes through factor substitution. In view of the single product output, there is no substitution in consumption. Piketty exploits this unstable feature of the analysis in predicting unstable future distribution patterns. It is well known that such unstable formats are contradicted by real world behaviour. It would appear that Piketty accepted the $r > g$ condition from historical trends that he observed in the data without researching the analytical fundamentals of the hypothesis. In this respect he fell into the trap of *measurement without theory*, an expression associated with Koopmans (1947).

From this exposition it is not surprising that Acemoglu and Robinson (2015) could not establish empirical evidence in support of the $r > g$ hypothesis. After having applied different data sets and varying procedures they could not verify the feasibility of this hypothesis. In similar vein Mankiw (2015) could not establish the general meaning of the $r > g$ condition. This follows from the fact that it is only valid under special conditions, as discussed above.

In sum, it appears that the author considered an economic growth exposition which he presented as a general case while it turns out to be a special case. Moreover, this special case generates an unstable equilibrium solution that is not supported by empirical evidence. In emphasising the importance of this special case in terms of historical data the author failed in analysing the fundamental properties of his analytical framework. In this sense he fell into the Koopmans trap of *measurement without theory*.

3. VARIABLE FACTOR PROPORTIONS

Understanding unequal income distribution patterns requires a different analytical framework. We start by abandoning the fixed factor proportions analytical framework in favour of a variable factor proportions exposition. An important feature of variable factor proportions is the presence of adjustment processes. The relative prices of the factors of production are important in that relative price differences trigger substitution in production. This secures stable equilibrium solutions. Furthermore, technological progress features prominently in this analysis. We distinguish three

types of technological progress that we define in terms of the general production function, introduced above.

The most widely applied is the so-called total factor productivity or Hicks-neutral technological progress. Denoting technical progress by A, renders the following results

$y = Af(k,\ell); \quad A, k, \ell > 0.$

Capital augmenting, or Solow-neutral technical progress, is denoted as follows

$y = f(Ak,\ell); \quad A, k, \ell > 0,$

while labour augmenting, or Harrod-neutral technical progress, is defined by

$y = f(k,A\ell); \quad A, k, \ell > 0.$

The relative ease that factors of production are substituted for each other is expressed in terms of the elasticity of substitution (σ). For the general function $y = f(k,\ell)$ we define

$\sigma = du/u \, / \, dR/R$, where $u = \ell/k$ and $R = \partial y/\partial k \, / \, \partial y/\partial \ell$

For $du/u = dR/R => \sigma = 1.$

We distinguish two limiting values for σ namely $\sigma = \infty$ and $\sigma = 0$. For a special case of variable factor proportions, such as the Cobb-Douglas function, we have $\sigma = 1$. From this exposition it follows that the fixed factor proportions exposition by Piketty, discussed above, satisfies the condition $\sigma = 0$.

In chapter 6 of *Capital in the Twenty-First Century* Piketty considers a general case production function. Piketty claims that the historical data support a value for σ such that $\sigma > 1$. He admitted that this implies a better condition for factor substitution than the generally accepted value of $\sigma < 1$. Unfortunately, the author did not pursue this analysis but returned to a fixed factor proportions analysis while introducing a rise in the supply of capital through increased saving, à la Harrod. The outcome is a rising capital income share that is likely to increase without bound in accordance with the unstable equilibrium that is typical of fixed factor proportions growth models, for which $\sigma = 0$.

From this exposition it appears that one has to discover the relation between technology, factor substitution and the relative price of investment or capital goods. For this purpose we consider a CES production function that does not comply with a fixed degree in returns to scale. There are two but dissimilar formulations of the CES function. For our purpose we choose the one suggested by Brown and De Cani (1963) that permits any degree of returns. We are, therefore, not restricted by the constraint of expressing factor shares in terms of a fixed ratio. The other CES formulation is more familiar and is associated with Arrow, Chenery, Minhas and Solow (1961).

We define the production function as follows:

(1) $y = \gamma[\kappa k^{-\alpha} + (1-\kappa)\ell^{\alpha}]^{-\upsilon/\alpha}$

Where γ is a scale parameter that denotes the efficiency of production; κ denotes the capital intensity with $0 < \kappa < 1$; υ describes the degree of homogeneity of the function. The elasticity of substitution of the factors of production can be calculated, i.e. $\sigma = 1/1+\alpha$ and $-\alpha = 1-1/\sigma$.

Non-neutral technical progress is associated with a change in the marginal rate of substitution which, as indicated above, is a component of the elasticity of substitution. We follow Brown (1966) and Allan (1960) and consider

$R = \partial y/\partial k \,/\, \partial y/\partial \ell.$

Expressing R in terms of the parameters of the production function (1) renders the following formulation:

$R = \kappa/1 - \kappa(\ell/k)^{1/\sigma}.$

Non-neutral technical progress can be defined in terms of κ, the capital intensity and σ, the elasticity of substitution between the factors of production. That means we consider

$\partial R/\partial \kappa = R \,/\, \kappa(1-\kappa).$

The presence of non-neutral technical progress implies a higher capital/labour ratio and $\partial y/\partial k$ rises and the marginal rate of substitution changes. Non-neutral technical progress induced by σ is as follows:

$\partial R/\partial \sigma = - R/\sigma \log u.$

There are two different outcomes to consider, namely,

$\partial R/\partial \sigma < 0$, if $\log \ell > \log k$: $\partial y/\partial \ell > \partial y/\partial k$

$\partial R/\partial \sigma > 0$, if $\log k > \log \ell$: $\partial y/\partial k > \partial y/\partial \ell$

If σ changes and the marginal rate of substitution falls, technical progress is capital saving, conversely if σ changes and the marginal rate of substitution rises the technical progress is capital using. An event that is of particular interest to this exposition is a rising σ that is accompanied by an expansion in capital that exceeds that of labour. The rise in σ will secure that $\partial y/\partial k > \partial y \partial \ell$ and the technical progress is capital using.

As indicated above, Piketty considered the condition $\sigma > 1$ to be confirmed by his historical data but did not investigate the relation between σ and technical progress because of the limitations imposed by a fixed factor proportions production function. This observation stimulated a debate regarding the value of σ as staged by Rognlie (2015). It would appear that the importance of this debate is highly overrated. There are two reasons for this. Firstly, as has been indicated above, non-neutral technical progress is not conditional on $\sigma > 1$. The thrust of the argument is that a capital expansion that goes with a rising σ renders capital using technical progress. Secondly, Piketty overlook an important literature that is concerned with the long-term declining tendency in the relative price of capital goods. This relative price pattern is important within a variable factor proportions analysis because it goes with non-neutral technical progress. The decline in the relative price of capital goods is not only evident in the US but appears to be a global feature, as has been argued by the IMF (2014). Similarly, Eichengreen (2015) discussed the same development with reference to early research by Gordon (1990). Gilchrist and Zakrajsek (2007) reported a long-term declining trend in the price of capital goods that they related to investment behaviour at the firm level. Fisher (2006)

related the declining trend in the relative price of capital goods to business cycle patterns while verifying a causal relation between the price pattern and investment.

Karabarbounis and Neiman (2014) took this research further by demonstrating that the decline in the relative price of investment or capital goods does explain the decline in the share of labour in total output. More explicitly, it is claimed that the declining price of investment goods account for half of the decline in labour's income share for firm-based as well as industry data over the period 1975-2012. Moreover, their research confirmed a more rapid decline in labour's income share in countries or industries with a more pronounced decline in the relative price of investment goods. The authors confirmed a relatively high presence of factor substitution owing to the elasticity of substitution between the factors of production having a value in excess of unity.

If we apply the results of this extensive research to a variable factor proportions framework very interesting results regarding income distribution follow. The declining trend in the relative price of capital goods, particularly as from 1980, is associated with non-neutral technological progress. To be more precise: It is associated with changes in σ. As capital expands and σ changes the marginal rate of substitution changes and we obtain the following expression:

$\partial R/\partial \sigma > 0$, for $u < 1$

This confirms that technological progress induced by a rising σ permits a larger amount of capital in production for every reduction in labour. The technical progress is capital-using and as σ rises the substitution of capital for labour is encouraged. If $\sigma > 1$ this process is explicitly encouraged as substitution between the factors becomes increasingly easier. In terms of the properties of the production function (1) above we do not require the condition of $\sigma > 1$. What is required is a change in the marginal rate of substitution. We merely require $\partial R/\partial \sigma > 0$. Brown (1966) demonstrated that for $\sigma > 1$, the production function (1) above has no limit when the factors of production expand. This outcome emphasises the significance of changes in the marginal rate of substitution when σ changes. Moreover, we confirm our observation, above, that the importance of the debate about the value of σ being $\sigma > 1$ or $\sigma < 1$ appears to be overrated.

The exposition above suggests that the declining trend in the relative price of capital goods has been accompanied by capital-using technical progress induced by a rising σ. The nature of the technical progress relies to a large degree on the implementation of new electronic equipment and communication devices. The implementation of these technologies goes with significant efficiency gains in production. The relative price of capital goods falls, capital becomes relatively cheap and it is substituted for labour. The efficiency gains in capital are gaining such prominence through time that they outweigh the potential diminishing returns to capital and capital is substituted for labour on such a scale that labour's share in income declines. It appears that the unequal income distribution problem is induced by labour.

4. POLICY IMPLICATIONS

An analysis of income distribution patterns in terms of the supply-side of an economy relies on an application of the theories of production and economic growth. We distinguished two approaches within the context of a closed economy. The first relies on the assumption of fixed factor proportions in production with no substitution possibilities between the factors of production. The

economic growth theory that relies on these assumptions is known for its rigid structure in adjustment. The corresponding equilibrium solutions are unstable. Policy proposals based on this rigid analytical framework are usually of an interventionist nature. Despite isolated references to a more general growth framework, Piketty primary applied this restrictive framework in explaining the present unequal income distribution patterns. It is not surprising that he proposed interventionist policy measures. Lavoie (2014) referred to Piketty as an interventionist in the sense of being a post-Keynesian. Our analysis demonstrated the deficiencies of this rigid and interventionist approach. Moreover, we claim that this particular analysis is unsuccessful in explaining problems of unequal income distribution effectively.

The global wealth tax proposed in terms of this rigid analytical framework is a utopian concept in the sense that it relies heavily on international cooperation in the conduct of tax policies. International cooperation on this scale is unlikely to be achieved. The experience is that international cooperation in terms of much simpler and less complicated tax policies has a low success rate. In similar vein, multilateral trade agreements show little progress in the modern world and they are making way for regional trade agreements.

Apart from particular deficiencies, such as tax shifting, we claim that a global wealth tax cannot resolve the unstable growth pattern that satisfies the Piketty condition of $r > g$. It has no institutional feature to support any adjustment process to correct the unstable nature of the income distribution pattern described by its author. The proposal lacks any flexibility of addressing the institutional processes that drive income distribution patterns as argued by Acemoglu and Robinson (2015).

As opposed to this rigid analytical framework we proposed an economic growth exposition based on variable factor proportions in production. We demonstrated that Piketty's approach is a special case of this more general framework. Moreover, we abandoned the typical neoclassical convention of expressing income shares in fixed proportions while allowing for variable scale options. In terms of recent research it is evident that unequal income distribution outcomes are related to non-neutral technical progress associated with the global declining trend in the relative price of capital goods. We accommodated these features within a general production and growth framework to obtain results that contradict Piketty's predictions.

The outcome of our analysis is that the growing inequality in many countries but particularly in the US is to be explained via the labour market as opposed to emphasising capital. In this respect Rognlie (2015) is correct in arguing that the concern about income inequality is likely to gain a better understanding of the problem by concentrating on within labour market distribution patterns as opposed to investigating the capital-labour split.

This conclusion brings the policy debate closer the Goldin and Katz (2008) hypothesis that emphasises labour market features in explaining unequal income distribution. Although their study focused on the US it would appear that similar tendencies are evident in other countries as well. The authors demonstrated the close relation between technological progress, education and inequality. During the first half of the twentieth century education in the US expanded more rapidly than technology. Higher real incomes were associated with less inequality. During the second half of that century technical progress exceeded advances in education and income growth started following an unequal distribution pattern. Technological developments created a strong demand for highly skilled people while education appeared to be lacking in supply. Skills started commanding a

premium and highly educated and talented people gained as the income distribution became more unequal. This process became distorted as some individuals were in a position to earn so-called Superstar incomes as, for instance, Superstar CEOs that feature in the critical analysis of this behaviour by Malmendier and Tate (2009). This phenomenon has also been explored by Kaplan and Rauh (2013). To this could be added the income distorting remunerations of football heroes. These distorted distribution patterns confirm the inefficiencies that go with unequal income distribution

The policy proposal coming from our analysis suggests that unequal income distribution is to be corrected via the labour market, particularly through labour market reforms and investments that will reverse the declining supply of skilled people in an age of rapidly advancing technological progress. Our analysis suggests that technical progress under present conditions appear to be capital-using. Capital goods are the major beneficiaries of these advancements and the relative price of capital goods decline. Capital is substituted for labour on such a scale that the income share of labour is falling. Interventionist policies such as a tax on capital will, in all likelihood, encourage rather than discourage capital-using technical progress. Investment in favour of an increased supply of quality people will discourage the unequal distribution pattern in various ways. Most importantly, it will encourage diminishing returns in respect of capital-using technological progress. This is likely to discourage the drive towards cheap capital. The excessive premium that skills carry will come under pressure and the substitution process is likely to change as σ could start falling. Addressing the distortions in the labour market in this way implies corrective actions aimed at the critical variables that are driving unequal income distribution.

5. CONCLUSION

Income distribution can be analysed in different ways. Piketty approached the subject from the supply-side through an economic growth exposition. We demonstrated that he followed an exposition that is valid under special conditions that cannot claim general validity and which lack empirical confirmation. Piketty's exposition suffers from methodological errors. Moreover, important literature on the relative price of capital goods that do feature prominently in income distribution has been overlooked. The importance of the elasticity of substitution in production has been identified by the author but the prominent role of this parameter in technological progress and income distribution does not feature in the analysis. The explanation of income distribution patterns in terms of this analysis cannot claim general validity.

We explained income distribution patterns through an economic growth framework that adheres to more general analytical features as the one described above. Moreover, we considered a production technology that allows for variable scale effects. We abandoned the neoclassical convention of expressing income shares in terms of fixed ratios. The presence of non-neutral technical progress has been linked to variable capital intensities and changes in the elasticity of factor substitution. It follows that biased technical progress under conditions of capital expansion matches the empirical condition of falling relative prices of capital goods, as has been reported in the literature. Bias technology overrules diminishing returns as capital expands and capital is rendered relatively cheap. The substitution in favour of capital occurs on such a scale that labour's income share falls. The root cause of unequal income distribution lies in the labour market. Corrective policies should aim at labour market reforms and extensive investments directed at enhancing the quality of human capital. This would be the preferred way of reversing biased factor

substitution while encouraging diminishing returns in non-neutral capital-using technological progress. This is likely the most effective way of addressing unequal income distribution patterns.

REFERENCES

ACEMOGLU, D. AND ROBINSON, J.A. (2015). The rise and decline of general laws of capitalism. *Journal of Economic Perspectives,* 29(1), 3-28.

ALLAN. R.G.D. (1960). *Mathematical Analysis for Economists.* London: Macmillan.

ARROW, K.J., CHENERY, H.B., MINHAS, B.S. AND SOLOW, R.M. (1961). Capital-labour substitution and economic efficiency. *Review of Economics and Statistics,* 45, 225-250.

AUERBACH, A.J. AND HASSET, K. (2015). Capital taxation in the twenty-first century. *American Economic Review: Papers & Proceedings,* 105(5), 38-42.

BLUME, L.E. AND SARGENT, T.J. (2015). Harrod 1939. *Economic Journal,* 125(583),350-357.

BROWN, M. AND DE CANI, J.S. (1963). Technological change and the distribution of income. *International Economic Review, 4, 289-309.*

BROWN, M. (1966). *On the Theory and Measurement of Technological Change.* Cambridge: Cambridge University Press.

DE ROOS, F. AND SCHOUTEN, D.B.J. (1960). *Groeitheorie.* Haarlem: Bohn.

EICHENGREEN, B. (2015). Secular stagnation: the long view. *American Economic Review: Papers & Proceedings,* 105(5), 66-70.

FISHER, J.D.M. (2006). The dynamic effects of neutral and investment specific technology shocks. *Journal of Political Economy, 114(3), 413-451.*

GILCHRIST, S. AND ZAKRAJSEK, E. (2007). Investment and the cost of capital: New evidence from the Corporate Board Market, *NBER,* wp 13174.

GILES, C. (2014). Data problems with capital in the 21st century. *London Financial Times*, 23 May.

GORDON, R.J. (1990). *The Measurement of Durable Goods Prices.* Chicago: University of Chicago Press.

GOLDIN, C. AND KATZ, L.F. (2008). *The Race between Education and Technology.* Cambridge (Mass): Harvard.

HARROD, R.F. (1939). An Essay in dynamic theory. Reprinted in *Economic Journal*, 2015, 125(583), 358-377.

HICKS, J.R. (1949). Mr. Harrod's dynamic theory. *Economica,* n.s., 15.

INTERNATIONAL MONETARY FUND (IMF). (2014). *World Economic Outlook, April.* Washington (DC): IMF.

KAPLAN, S.N. AND RAUCH, J. (2013). It's the market: The broad-based rise in the return to top talent. *Journal of Economic Perspectives,* 27(3), 35-56.

KARABARBOUNIS, L. AND NEIMAN, B. (2014). The global decline of the labour share. *Quarterly Journal of Economics,* 129(1), 61-63.

KOOPMANS, T.C. (1947). Measurement without theory. *Review of Economic Statistics,* 29.

LAVOIE, M. (2014). *Post-Keynesian Economics: New Foundations.* Cheltenham: Elgar.

MALMENDIER, U. AND TATE, G. (2009). Superstar CEOs. *Quarterly Journal of Economics,* 124(4), 1593-1638.

MANKIW, G.N. (2015). Yes, r > g, so what? *American Economic Review: Papers & Proceedings,* 102(5), 43-47.

PIKETTY, T. (2014). *Capital in the Twenty-First Century.* Cambridge (Mass): Harvard/Belknap.

ROGNLIE, M. (2015). Deciphering the fall and rise in net capital share. *Brookings Papers on Economic Activity,* BPEA Conference Draft, March.

SOLOW, R.M. (2014). Capital in the twenty-first century. *New Republic,* 22 April, 1-8.

WEIL, D.N. (2015). Capital and wealth in the twenty-first century, *American Economic Review: Papers & Proceedings,* 105(5), 34-37.