Two Social Visions: Marginal Productivity, Search Frictions, and Distributional Justice

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I. Introduction

Satisfactorily modelling the labour market remains to this day among the most intractable problems in the field of economics. In large part, the difficulty for economists stems from the uniqueness of human labour-power as a commodity, which sets it apart from the multitude of other, inanimate commodities that are routinely exchanged through markets. As John Hicks summarises in the Preface to his influential Theory of Wages:

The need for a special theory of wages only arises because both the supply of labour, and the demand for it, and the way in which [this] demand and supply interact on the labour market… make it impossible to apply to labour the ordinary theory of commodity value without some further consideration. (Hicks, 1963, p. x)

Yet capturing the technical complications inherent to the analysis of the labour market constitutes but one side of the problem that a fully-fledged theory of wages is meant to address. The vast majority of economic agents in capitalist economies derive their income from the sale of their labour-power; indeed, the very existence of a class of labourers whose subsistence compels them to offer up their labour-power as an exchangeable commodity is one of the defining characteristics of capitalism as an economic system. Models of the labour market are as such inextricably bound up with questions regarding the distributional tendencies of the capitalist economy, including both the distribution of individual incomes and, more broadly, the determination of relative income shares of owners of different inputs to production. How economists conceptualise the labour market, therefore, dictates to a significant extent how they conceive of the “social vision” of economics, that is, the “coherent moral-philosophical account of how [the economy] works, and how it ought to work” (Ackerman and Beggs, 2013, p. 31).
This paper reconstructs and juxtaposes the differing social visions immanent to two prominent models of the labour market: the marginal productivity model of income distribution, and the Diamond-Mortensen-Pissarides (DMP) family of search-and-matching labour market models. From this reconstruction, it concludes that the fundamental divergence between the models’ visions of industrial relations, and of capitalist society more generally, hinges upon the strikingly distinct mechanisms by which the models derive the price of labour-power; how, in short, they determine the relative share of income to labour. The former posits that the equilibrium level of wages in a market economy is rigidly set by the marginal productivity of labour, which is arrived at by the abstract forces of demand and supply under background conditions of consumer preferences, capital and labour endowments, and existing technologies. The latter, by contrast, introduces a wide latitude of indeterminacy to equilibrium wage-setting by including search frictions in the process of job creation and job destruction, which enable the possibility of quasi-rent-seeking through bargaining by entrepreneur-capitalists and labourers. It is this indeterminacy of input prices, the decoupling of payments to labour from labour productivity, that endows the search-and-matching model with radically different implications for the evaluation of income inequality, labour-market policies designed to manage income inequality, and the justness of distributional shares under capitalism.

The choice of the models is not incidental. The framework of marginal productivity has almost wholly dominated economic thought and the teaching of economics from its inception in the late 19th century, at least as far as theories of long-run distribution are concerned (King, 1990). The equalisation of marginal productivities and factor payments is a standard practice

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2 A cursory survey of popular, widely-distributed economics textbooks (of any grade) would lend substantial weight to this contention.
throughout the discipline and is present in a wide variety of models that range from long-term growth to business-cycle models. Deviations from this result are frequently attributed to the existence of “market imperfections”, with the implication being that the determination of income shares by marginal productivities is the ultimate benchmark with which the actual functioning of market economies should be compared. In this regard, the DMP search-and-matching model, and its diagnosis of irreducible search frictions, represents a challenge to the hegemonic status of the marginal productivity theory of wage-setting – and, as this paper argues, the social vision that the marginalist model lends itself to. What is especially notable about the DMP model’s challenge, and what separates it from other would-be challengers, is both its proximity to the marginalist paradigm and its rapid acceptance into the mainstream.3 While post-Keynesian, Marxian, and institutionalist alternatives have sought unsuccessfully to upend the entire basis upon which marginalism rests, the search-and-matching models instead subtly disarm the explanatory power of the concept of marginal productivity while retaining most of the underlying assumptions of the marginalists, as is shown below. However, the search-and-matching literature, with its focus on the model’s macroeconomic predictions, heavily downplays or underemphasises the degree to which its models differ from the theory of marginal productivity (Mortensen and Pissarides, 1999). The goal behind this investigation is, in part, to bring these fundamental differences to the surface.

The remainder of this paper proceeds as follows. Section II presents, in turn, the marginal productivity and the DMP search-and-matching models. Section III outlines the social visions

3 Diamond, Mortensen, and Pissarides were jointly awarded the Nobel Prize in Economic Sciences in 2010 for their contributions to the model. The Nobel Committee’s paper for the award singles out search-and-matching theory as “the leading paradigm in macroeconomic analyses of the [labor] market” (Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, 2010, p. 27).
that the models’ assumptions and results underpin. The two visions are then compared by examining the ways in which each model allows economists to comprehend income inequality, labour-market policies that deal with income inequality, and distributional justice altogether. Section IV concludes with remarks on the possible incompatibility of the two models, and whether this incompatibility could influence the direction of labour economics in the near future.
II. Presenting the Models

II.1. The Marginal Productivity Model of Distribution

The marginalist model of distribution has its intellectual origins in two separate strands of thought. The first is the theory of marginal utility, pioneered independently in the 1860s and 70s by William Stanley Jevons, Carl Menger, and Léon Walras. The crucial insight in their writings that found its way into the marginalist model is that the value of commodities is ultimately a subjective measure, based on an imputed “law” of diminishing marginal returns to consumption. The second is David Ricardo’s theory of ground rent. Ricardo (2004) proposed that the level of rent is based on the rate of return of the “least productive” plot of land brought into cultivation; as is elucidated below, the early marginalists merely extended Ricardo’s conjecture to the return on all other factors of production. The synthesis of these two theories in the 1890s resulted in an overarching model of distribution that was labelled the theory of marginal productivity, fulfilling the classical economists’ desire for a unified framework by which to determine how the “national dividend” was split amongst the “great classes” of modern society (Ackerman and Beggs, 2013, p. 28).

The first formulation of the marginalist model was published in the 1890s by Clark (1890) and Marshall (1920). In essence, their answer to the question of the “division of the national dividend” was to, in Clark’s words, conceptualise distribution “as determined by a law of rent,” rent here meant in the Ricardian sense. Under the assumptions of perfectly competitive markets and profit-maximizing, price-taking firms, they argued that firms would purchase inputs up until the point at which their contribution to revenue were equal to their cost; this they termed the input’s marginal productivity. If the cost of an input exceeded its contribution, the firm
would substitute away from it in favour of other, less expensive inputs, until the value of each input’s output equalled its price at the margin. The logic behind this argument rests on a supposed diminishing marginal rate of return (a “law of variable proportions”) to factors of production. Taking the case of labour as input, this refers to the decreasing amount of physical output yielded by successive increments of labour, holding the amounts of other factors, such as land and capital, constant. The aforementioned contribution to revenue that a single increment of labour is taken to add is in turn influenced by the level of demand for the output of the firm, which is determined by given consumer preferences and other relevant market conditions. To complete the equilibrium, the price of labour-power is determined by the scarcity (the supply) of labourers with requisite talents on the market. The product of these two forces of demand and supply, combined with the profit-maximizing behaviour and technology of firms, sets the marginal product of labour. Hence, at equilibrium, the wages for a particular kind of labour corresponds to and varies directly with that kind of labour’s marginal addition to the national dividend.

Dorfman (2008) provides a useful mathematical formalisation of this finding. He defines the marginal product of a factor as “the ratio of the greatest change in the output of some product that can be obtained by a small change in the use of the factor to the change in the use of the factor,” which he then compresses into the following formula:

\[
\frac{\delta y_i}{\delta x_j} = \frac{w_j}{p_i} \quad (1)
\]

where \( y_i \) is the quantity of a firm’s output, \( p_i \) its price, \( x_j \) the quantity of a firm’s input, and \( w_j \) its remuneration. Rearranging:
\[ VMP_j = p_i \left( \frac{\delta y_i}{\delta x_j} \right) = w_j \]  \hspace{1cm} (2)

VMP here standing for the “Value of the Marginal Product of Factor \( j \)”. (2) states that the VMP of a factor \( x_j \) is the increase in the value produced of product \( y_i \) for which that factor is used, per unit increase in the use of the factor, which, when firms are profit-maximizing, is equal to the price per unit of that factor’s services (Dorfman, 2008).

One critical assumption of the marginalist model that has so far been glossed over in this presentation is the presupposition of a perfect, or near-perfect, capacity for substitution between factors by firms. For firms and factor prices to truly behave as Clark and Marshall predicted, firms must be able to vary their inputs (at least in the medium-run) freely. Otherwise, factors could be remunerated above or below their marginal products for extended periods of time. By the 1930s, this premise of “differentiable production functions” was held to be untenable: the vast majority of actually existing, technologically-determined production functions used by firms were found to have fixed input ratios, even in the long-run, which greatly limited the scope for substitution (Ackerman, 2014). Moreover, these production functions did not reflect the prediction by the marginalists of decreasing marginal returns to labour; the returns tended to be constant (Miller, 2010). In recognition of these defects, Hicks (1932, 1963) reformulated the rationale behind the marginalist model by shifting the burden of substitution from firms to consumers. If, for instance, the price of labour-power increased, the increase in price for labour-intensive goods would reduce the demand for them. This would, Hicks proposed, eventually lower the price of labour-power back to equilibrium level, labour’s marginal product. In this way, Hicks preserved the main thrust of the marginalist model (fundamental, as described below

\[ \text{These findings have been repeatedly corroborated by studies conducted over the past half-century (Miller, 2010).} \]
in Section III, to its social vision), that is, that wages are in the final analysis determined by the demand and supply for labour and vary proportionately with labour’s contribution to output. Notably, Hicks’ revised version of the marginalist model, with minor additions, has endured to the present day (Ackerman 2014; Dorfman 2008).

Hicks’ restatement of the marginalist model, however, rapidly came under severe criticism, most notably by Robinson (1953) and Sraffa (1960). Their critiques, and the damage they inflicted upon the standing of the marginalist doctrine, are briefly touched upon in Section IV.

II.2. The Diamond-Mortensen-Pissarides Search-and-Matching Model

Search theory first emerged in the early 1960s as an attempt to model and interpret wage and price dispersion, as well as unemployment fluctuations, found in micro- and macroeconomic data (dispersions that, for the most part, could not be accounted for by marginalist theory). The rise of search theory is closely related to the development of the economics of information as a separate branch of the discipline. The foundational papers in the field are usually considered to be Stigler (1961) and McCall (1970), both of which provided rudimentary models of consumer and labourer search for “bargains” and job vacancies. As these papers illustrate, the motivating observation behind the literature for search models is that economic agents, whether consumers, labourers, or firms, are often incapable of instantaneously finding a trading partner or an

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5 This has not prevented, however, the widespread use of the old formulation by Clark and Marshall in the contemporary teaching of economics, under the flimsy pretense that it is a useful pedagogical tool for the uninitiated (Dorfman, 2008; Ackerman, 2014).
employer for structural reasons, and as a result are forced to incur surveying costs (measured in both monetary terms and time).

The earliest paper to explicitly model the labour market using the findings from search theory was Lucas and Prescott (1974), although the methodology behind their model quickly came under fire for simplistically, and unrealistically, reproducing the basic presuppositions of marginal productivity theory (Rogerson, Shimer and Wright, 2005, p. 967). By contrast, the Diamond-Mortensen-Pissarides model was gradually developed in the 1980s in Diamond (1982a, 1982b), Mortensen (1982a, 1982b), and Pissarides (1984a, 1984b, 1985), and distinguished itself by introducing search frictions that yielded equilibrium levels of unemployment and cyclical fluctuations of unemployment consistent with statistical evidence. In the DMP scheme, unemployed labourers and vacancies encounter one another according to a matching function; once they meet, they carry out bilateral exchanges (“matches”). These matches are then taken to produce a certain economic surplus that is noncooperatively divided between labourers and firms according to a bargaining rule. The ability of labourers to bargain over their wage bill is attributable to the costs for firms of posting vacancies and reengaging in search activity. Matches are also taken to terminate at an exogenous rate. The model’s equilibrium is then specified by a combination of exogenous and endogenous parameters that equalise the flows in and out of employment, which at the same time map out a negative relationship between the overall level of unemployment and vacancies.

Most important for this investigation’s purposes, however, is the fact that the model does not provide a unique equilibrium level of wages. A large number of equilibria are theoretically possible. Which one the model settles on ultimately depends on a pair of exogenous parameters that capture the value of unemployment for labourers and their relative bargaining power. This
point can be clarified through a presentation of the most basic, “workbench” version of the DMP model. This exposition closely follows those found in Rogerson et al. (2005) and Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences (2010).

Consider a labour market with a fixed number of labour force participants, which is normalised to unity. The number of unemployed labourers is thus represented by \( u \). There are a theoretically infinite number of firms, who post vacancies \( v \) at a cost \( k \). The vacancies can be interpreted as either multiple vacancies for a single firm (or group of firms) or single-vacancy firms without affecting the model’s results. Both labourers and firms are homogenous, risk-neutral, and utility/profit-maximisers. Time is continuous and labourers and firms have infinite time horizons. Unemployed labourers enter employment at the rate \( p \), firms fill vacancies at the rate \( q \), both of which are endogenously determined, and matches between labourers and vacancies are terminated at the exogenous rate \( \lambda \). Matches produce exogenous output \( y \), which is larger than \( k \). The labour market’s frictions are encapsulated in a matching function of the form \( m = m(u, v) \), which is taken as increasing in both \( u \) and \( v \), concave, and exhibiting constant returns to scale. As such, the rate of job entry is described by \( p = m(u, v)/u = m(1, u/v) = p(\theta) \), where \( \theta = v/u \) is a measure of “market tightness”, and the rate of vacancy filling is described by \( q = m(u, v)/v = m(u/v, 1) = q(\theta) \). Clearly, \( p'(\theta) > 0, q'(\theta) < 0 \), and \( p(\theta) = \theta q(\theta) \), which reflects the fact that the number of unemployed labourers finding vacancies and the number of vacancies filled is the same.

The steady-state level of unemployment is that which reflects an equal rate of match formation and match termination. This is calculated by equalizing the inflow from employment into unemployment, \( \lambda (1 - u) \), to the outflow from unemployment to employment, \( p(\theta)u \), which gives:
\[ u = \frac{\lambda}{\lambda + p(\theta)} \quad (3) \]

Let \( U \) denote the expected present value of income of an unemployed worker, \( W \) the present value of an employed worker, \( V \) the present value for the firm of holding an open vacancy, and \( J \) the value for the firm of having a vacancy occupied by a labourer. These value functions can be written as:

\[ rU = b + p(\theta)(W - U) \quad (4) \]
\[ rW = w + \lambda(U - W) \quad (5) \]
\[ rV = -k + q(\theta)(J - V) \quad (6) \]
\[ rJ = y - w + \lambda(V - J) \quad (7) \]

where \( r \) is the rate of discount, \( b \) the value of unemployment (value of home production, leisure, and/or unemployment benefits), and \( w \) is the wage. As the market is assumed to be competitive with no barriers to entry, a free entry condition is imposed such that firms enter and exit until the value of posting a vacancy is 0, that is, \( V = 0 \). Combined with (4) and (6), this gives the demand-side relationship:

\[ y - w = \frac{(r + \lambda)k}{q(\theta)} \quad (8) \]

(8) states that the surplus from a match for a firm has to equal the ratio of the sum of the discount rate and the termination rate over the rate of vacancy filling multiplied by the cost of posting a vacancy.

When a labourer and a firm form a match, they bargain over the wage using the generalised Nash bargaining solution with \( U \) and \( V \) as their respective “threat points”, which is:
\[ w \in \text{argmax} \ [W(w) - U]^{\xi} [J(w) - V]^{1-\xi} \]

where \( \xi \) is an exogenous measure of the labourer’s relative bargaining power, and is a number between 0 and 1. The maximisation problem resolves itself into:

\[ W(w) - U = \xi [W(w) - U + J(w) - V] = \xi S \quad (9) \]

where \( S \) is net surplus of the match. Substituting (5), (6), (7), and (7) into (9), simplifying, and imposing the free entry condition leaves us with an equation for the equilibrium wage:

\[ w = (1 - \xi) b + \xi (y + k \theta) \quad (10) \]

The model’s equilibrium is thus characterised by (4), (8), and (10). (8) and (10) determine \( w \) and \( \theta \), (4) determines the steady-state unemployment rate \( u \), and the equilibrium number of vacancies is calculated from the identity \( v = \theta u \). Shocks to the exogenous parameters are transmitted through changes in the prevailing wage and the number of vacancies posted, and result in altered equilibrium levels of labour market tightness and unemployment.

As mentioned above, the model just presented is the most elementary in the family of DMP models. Various additions have been made since the model’s inception, and they include (but are not limited to) the extension, formalisation and endogenisation of the matching function, of the separation rate, and of the output level of matches, the introduction of heterogeneous and risk-averse labourers and firms, of capital as an input, and of labourer costs to search, and the inclusion of on-the-job search (Rogerson et al., 2005; Mortensen and Pissarides, 1994, 1999; Pentronglo and Pissarides, 2001; Pissarides 1984a).
Yet even with these modifications, the DMP models all share the noncooperative bargaining game by which surpluses are divided between labourers and the entrepreneur-capitalists who own the firms, leaving the equilibrium wage in an important sense *underdetermined*. Depending on the relative bargaining power of labourers $\xi$, the wage can range from $b$ to $y + k\theta$, since within these boundaries neither the labourer nor the entrepreneur-capitalist has an incentive to separate and return to the labour market. That is, the search frictions expressed by the matching function $m$ enable *quasi-rent-seeking* on the part of both parties. Moreover, the floor to negotiations is set by $b$, the value of unemployment, which, as already mentioned, includes such variables as the value of homemade production, the enjoyment of leisure, unemployment benefits, etc. Thus, in the DMP framework, the remuneration to labour is greatly influenced by two parameters that are not determined by market forces. On the contrary, the presence of both $\xi$ and $b$ heralds the intrusion of institutions, political processes, customs, and social values to the determination of wages.

There are two final observations regarding the DMP model that merit attention before moving on to Section III. Firstly, aside from including non-economic parameters, the equation for the equilibrium wage also largely decouples the payments to labour from labour productivity. Improvements in total factor productivity, translated into increases in $y$, only increase the wage to the proportion indicated by the relative bargaining power of labour. In other words, the gains from increased productivity do not automatically flow to labourers (or firms), as the marginalist model would imply. They are instead appropriated on the basis of strength at the negotiating table. Deterioration in total factor productivity either results in an immediate termination of the match or has no effect on the wage. Secondly, the DMP model reaches these grossly different conclusions with respect to distributional shares without doing away with most of the critical
presuppositions of marginalist theory: competitive markets (the free entry condition), profit-maximizing firms, and even the law of diminishing marginal returns, which can be inserted into the model if the exogenous parameter $y$ is replaced by a concave production function.
III. Exploring the Social Visions

III.1. Harmony and Conflict

We are now prepared to delve into the reconstruction of the social visions implicit in the marginal productivity model of distribution and the DMP search-and-matching model. Armed with the wage equilibrium equations (2) and (10), and the steps and assumptions required to derive them, we can paint two distinct portraits of the capitalist economy and its distributional mechanisms, as they are informed by each framework. What are the predominant sociological features that these formulas highlight?

In the marginalist model, every input to production is priced at its marginal contribution to the national dividend. These prices, furthermore, are established by no particular individual: they are the product of the self-interested actions of an innumerable number of economic agents. Through the impersonal pressures of demand and supply, the market absorbs the desires, endowments, and technological capabilities of consumers, labourers, and firms and, like a system of telecommunications, utilises them to produce a set of prices that perfectly allocate factors according to their relative scarcities and their social serviceability. Behind the backs, so to speak, of individuals actually involved in production, the market ensures that they are placed precisely where they can be of most use, where they are most in need. The social world that (2) conjures up is as such a self-regulating one, an organic unity the voluntary and unconscious nature of which stands in sharp contrast with the directedness and purposiveness of the realm of politics, where power is directly and consciously exerted. Indeed, the marginalist conception of the realm of economic activity is of a homeostatic network that is only truly disturbed from without, whether by states, special interest groups, or civic associations like trade unions. Through the
responses of substituting, utility-maximizing firms and consumers, intentional efforts to influence factor prices are bound to be thwarted: while unions may successfully raise wages through bargaining, they will eventually and inevitably be restored through substitution to the value that society would ideally set from impersonal standpoint, which is labour’s marginal product.

This final clause brings up a second preeminent characteristic in the marginalist social vision, which is of an economic order that is harmonious, based on the principle of mutually beneficial exchange. Owners of labour-power, capital, and land come together and for their cooperation are rewarded in direct proportion to what they bring to the table. Wages, rates of interest, and ground rents therefore not only represent the relative shares of the economic pie that are distributed to differently-endowed agents, but also the social worth of these agents’ contributions. For this reason, marginal productivity theory has historically had a close affinity with the ethical doctrine of just deserts. Clark (1891) has precisely this doctrine in mind when he asserts that the “law” of marginal productivity ensures that “[each labourer] gets what he [or she] is worth to society,” for the removal of any single economic agent from his or her station subtracts from the total wealth of society precisely that which he or she received as payment (p. 308). To take a more contemporary example, Mankiw (2013) forcefully argues against redistributive proposals on the grounds that inequality in incomes is only unjustified if the earnings of the very wealthiest are predicated upon “taking advantage of some market failure or political process,” for in the “standard competitive labour market, a person’s earnings equal the value of his or her marginal productivity... [his or her] economic contribution” (p. 28). Given this fact, he sniffs, “why should [considerations of fairness] supersede the right of a person to the fruits of his own labour?” (Mankiw, 2013; p. 32) Admittedly, both Clark and Mankiw may be
taking leaps in logic in tying marginal productivity to the moral stance of just deserts, as the marginalist model is silent when it comes to the history of the acquisition of capital and labour endowments. Nevertheless, the attractiveness of such a position to economists employing the marginalist model is to be accounted for by the beneficent properties of its social vision of the capitalist marketplace.

The DMP model, in contrast, tells a significantly different story. The inclusion of parameters in (10) that estimate the relative bargaining power of labour and the value of unemployment, and which greatly influence the equilibrium wage bill, indicates that the model recognises a certain indeterminacy on the part of the labour market to the setting of the price of labour-power. The gap left by this indeterminacy is filled instead by factors that are socio-political in nature, such as trade union density, labour-friendly state policies, unemployment insurance, or bargaining procedures based on customary practices and considerations of equity. The boundary between the sphere of the market and the sphere of politics maintained by the marginalist model is thus not tenable in the DMP framework, where power is exerted even at the point of production. In other words, what the DMP model tacitly acknowledges is that the market is always already shot through with the interference of the state and state-like actors, and its price-setting is always already filtered through institutional structures. Combined with the presence of search frictions, this blending between the economic and the political suggests that the DMP’s vision of the capitalist economy is not one of self-operating stability, but of constant, and cognizant, negotiation and renegotiation over the terms of exchange. Rather than relying on the bloodless activity of demand and supply to sort out the problem of distribution, economic agents are compelled to marshal whatever forces they have at their disposal to secure the best possible deal for themselves. To return to a metaphor used above, in the world rendered by the
DMP model the economic pie does not come into existence already divided into determinate parts. Instead, the clash between labourers and entrepreneur-capitalists decides the division. This makes the search-and-matching model much more amenable to alternative ethical theories of distribution, for unlike in the marginalist model, there is no guarantee that the market, on its own, will reward every agent what they deserve (whatever that may mean).

The social world of the DMP model is, it should be noted, a highly conflictual one. It presents a picture of an economy that is marked by structurally opposed interests, interests that are mediated largely from without the labour market itself. In this sense, the DMP model approximates the tack taken by Marxian and institutionalist models of the labour market, which likewise prioritise the role of class struggle and historically-specific institutions for the determination of distributional shares (King, 1990). There is a certain resemblance between the DMP’s underdetermination of the equilibrium wage and the way Marx characterises the conflict over the length of the working day in *Capital*:

The capitalist maintains his rights as a purchaser when he tries to make the working day as long as possible… The worker maintains his right as a seller when he wishes to reduce the working day to a particular normal length… There is here, therefore, an antinomy, of right against right, both bearing the seal of the law of exchange. *Between equal rights, force decides*. (Marx, 1993, p. 344; emphasis added)

In the search-and-matching model, both the labourer and the entrepreneur-capitalist have a “right” to the surplus that is produced by their match. Yet the market alone fails to stipulate the exact manner by which these rights are to be actualised. Hence, to borrow Marx’s phrase, force
(or the threat of force) resolves the impasse, in the form of policies and material conditions that affect the values of $\zeta$ and $b$.

The rest of this section examines how these divergent social visions translate into social scientific appraisal by evaluating the ways in which the models can make sense of, and address, a particularly polarising economic phenomenon: income inequality.

### III.2. Analysing Income Inequality

Though it is doubtful that there was ever a point in the history of capitalism in which the issue of income inequality did not figure prominently, it has recently garnered a tremendous amount of scrutiny from both academics and the general public (Atkinson, 2015). The cause behind the rekindling of this old controversy is the steep rise of income inequality within most of countries of the world over the past forty years, including those like China whose impressive growth rates had significantly narrowed between-country inequality. In discussing income inequality, however, a distinction must be drawn between two sources that are generally recognised to have contributed the recent increase measured in the data: a secular fall in the share of income to labour relative to capital, and a widening gulf between labour incomes, particularly between unskilled labourers and so-called “supermanagers” (Piketty, 2014; Ackerman, 2014).

The marginalist model can account for both of these trends with two separate explanations: an increased dispersion between marginal productivities, and a proliferation (or intensification) of market failures and rent-seeking opportunities. The first explanation relates directly to the presentation of the model given in Section II, in which every factor of production is rewarded by its contribution to production at the margin. If an input’s price is equal to its marginal product, then shifts in technological and organisational practices starting in the 1980s
must have made capital more productive than labour. This claim is given some weight by the noticeable contemporary trend in innovation that heavily favours capital-intensive industries, such as the legendary Silicon Valley start-ups that earn enormous sums in profit while employing relatively miniscule workforces. In a similar vein, the emergence of the “supermanager” can be chalked up to a swelling in the productivity of employees higher up the management ladder than those in the lower rungs. Globalisation, and its attendant improvements in transportation and communications technologies, has certainly put a higher premium on top-level talent, as firms compete on an increasingly broader geographical scale. The influx of billions of unskilled and semi-skilled labourers to the global labour force since the end of the Cold War may also have driven down the marginal product of less exceptional labouring talents. The second explanation is more difficult to pin down, largely because it operates precisely at the point at which the model’s explanatory power breaks down. Incomplete markets, markets with lax property rights, or markets with a high degree of monopoly power are all examples of market failures. Rent-seeking behaviour that could maintain the marginal product of capital or of managerial labour above their marginal product include lobbying efforts for “corporate welfare” and loopholes in corporate governance law.

The picture becomes foggier through the lens of the DMP model, not in the least because rent-seeking is taken to be part of the normal functioning of the labour market rather than an aberration. The decline in the labour share of income could be the result of a weakening of the relative bargaining power of labour (a decrease in $\xi$) and a worsening of the utility of unemployment (a decrease in $b$), both of which lower the equilibrium wage. This could be the effect of state policies that put a finger on the scale for capital, such as reductions to unemployment insurance, cuts to social services, welfare, and public infrastructure (e.g.,
recreational centres), the lifting of capital controls, and the enacting of legislature that hinders unionisation. The widespread slump in unionisation rates, the erosion of welfare states, and the increasing incidence of “wage theft” throughout the developed world serve as evidence for this conjecture. Of course, the decreases in $\xi$ and $b$ just listed could also have been about in part by structural changes in the economy that in the balance benefitted the bargaining position of capital. The take-off of managerial income could be explained in the DMP framework by an improvement of the bargaining power of those at the top of the labour income scale, whether through the aforementioned competitive pressures of globalisation or the spread of corporate arrangements that undermine the ability of shareholders to rein in managerial excesses. It could also be the case that contractions in the bargaining power of labour and the value of unemployment have a differential impact on different kinds of labourers, with unskilled labourers, being the most vulnerable, bearing the brunt of the losses.

We see how the social visions behind each model are reflected by how the models assess the uptick in income inequality. The marginalist model attributes the increase to either the proper functioning or (political) disturbances to the self-regulating allocative mechanisms of the labour market, while the DMP model interprets it largely as a product of shifting political forces that deteriorate the power of labour, and especially unskilled labour, at the negotiating table.

III.3. Policy Recommendations

How do the marginalist and DMP models shed light on policy proposals to arrest these upward trends in income inequality?

If we set aside the just deserts perspective, the marginal productivity model of distribution leads us to the conclusion that the only instruments for the redistribution of wealth
that can truly be effective are state-imposed taxation and transfer payments. Recall that in the marginalist framework, substitution by firms and consumers from more expensive factors (or expensive-factor-intensive goods) to less expensive ones ensure that factor prices cannot deviate from their marginal products for an extended period of time. Given a set of endowments, preferences, and technologies, labour markets adjust the wages for different kinds of labour to a series of fixed points. As we have already noted, the model suggests that associations such as trade unions are “powerless to raise the average level of wages… [as] union activity cannot affect the [marginal productivity of the labour force]” (Dorfman, 2008). Pre-transfer income inequality may be beyond the interventionist policymaker’s reach, but the gaps between earnings can be reduced through carefully targeted transfer schemes.

Intuitively, the model also would prescribe policies that seek to improve the average marginal product of labour. These could take the form of greater investments to human capital formation, such as increased funding for technical education and job training programs, by which the unskilled can become semi-skilled or skilled, and therefore contribute a greater share to the national dividend by their labour. This shift in the composition of the labour force would attack the problem of income inequality – at least, in the marginalist interpretation of the problem – at its source, as opposed to merely alleviating its symptoms. If the improvements to labour productivity were to outpace those to capital productivity, then the share of income to labour would halt its decline; if the average marginal product of labour were to rise faster than that of managers, then within-firm labour income inequality would fall. Note that both of these proposals are in line with the social vision of the marginalist model: the mechanism by which the market distributes income is left untouched, although the material with which it works its wonders is altered.
While it does not in principle provide opposition to these solutions, the DMP model offers a far wider scope for policymakers interested in combating income inequality to target pre-transfer distributional shares (“pre-distribution”). Because the equilibrium wage in the model can lie anywhere between the two boundaries described in Section II, the DMP framework accords an important role to the threat points that both parties face when bargaining and the strength with which they can exert their demands. In order to rebalance the relationship between labour and capital in labour’s favour, the threat point for labour could be raised with a higher minimum wage, a basic income provision, greater unemployment benefits, and spending on public infrastructure that raises the value of unemployment. In turn, the relative bargaining power of labour could be bolstered through higher union density and the establishment of institutionalised, corporatist bargaining boards with labour representation, which already exist in countries like Germany, Sweden, and Norway. Expressing the need for a “countervailing power” against the market power wielded by capital, Atkinson (2015) goes a step further in this regard and proposes the setting up of a “Social and Economic Council involving the social partners [of the economy] and other nongovernmental bodies” that has as its explicit mandate the “proper [balancing] of power among [society’s] stakeholders” (p. 133). All of these policy recommendations rest on the central sociological insight provided by the DMP model that we have repeatedly emphasised in this paper, namely, that labour markets to a not-insignificant extent distribute incomes on the basis of politically-charged conflicts between structurally opposed interests (“Between equal rights, force decides”). Impersonal market forces by themselves are not, in the end, the final

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6 Technically, the DMP model predicts that increases in $\zeta$ and $b$ lead to higher levels of unemployment at equilibrium, as firms post fewer vacancies. Pissarides (1984b) suggests this can be counteracted with job-subsidies financed by head taxes.
arbiters of capitalism’s distributional patterns, a conclusion that redistributive measures like Piketty’s capital tax overlook (Piketty, 2014).
IV. Concluding Remarks

This paper has sought to present two models of the labour market, the marginal productivity model of distribution and the Diamond-Mortensen-Pissarides search-and-matching model, and explore the social visions of the capitalist system that their respective presuppositions and results elucidate. The primary difference it has drawn between the two visions is in how they conceive of the process of distribution under capitalism: while the marginalist model imagines the economy as a self-regulating, cooperative enterprise, in which abstract market forces alone allocate to each participant the monetary value of his or her individual contribution to the total stock of wealth, the DMP model imbues the labour market with an inherent and antagonistic political dimension to its distributional mechanism, in which labourers and entrepreneur-capitalists are forced to struggle over the terms of the division of economic surpluses. The defining characteristic of the DMP model through which it reaches this distinct conclusion is its inclusion of search frictions, which, to return to Hicks’ quote in the Introduction to this essay, mimic the properties of labour-power as a commodity that separate it from all other marketable commodities. Finally, this investigation demonstrated how these differences in vision have concrete implications for the application of the models by highlighting the divergent ways in which each model allows for economists to understand, and design policy to counteract, income inequality.

Given their vastly different predictions and properties, it may be reasonably asked whether these two models can peacefully coexist as they currently do within the field of labour economics. While space considerations preclude a fuller treatment, I wish to bring up two relevant arguments in favour of the DMP model:
Firstly, the search frictions of the kind expressed by the DMP matching function are recognised today as a *sine qua non* of labour markets. They are “fundamental frictions that [economies] cannot avoid,” which makes the “appropriate [ideal] comparison” for data drawn from actual economies “not an economy without frictions” (ESPCRSAS, 2010). As search frictions are the element that render the marginalist model’s predictions of factor prices unreliable, there is a clear advantage to models like the DMP model that have these frictions built into their assumptions.

Secondly, serious technical and conceptual difficulties continue to hover around the notion of marginal productivity. Robinson (1953) and Sraffa (1960), which touched off what is now referred to as the “Cambridge Capital Controversy” in the 1960s, cast into doubt whether the term “marginal productivity of capital” can be properly defined at all, as what is included under the header of “capital” in marginalist production functions is in fact a gargantuan number of heterogeneous, non-labour inputs that are themselves produced by labour and non-labour inputs. Consumer demand for “capital”-intensive goods is, as such, demand for entire chains of inputs, which themselves have varying compositions of labour and non-labour inputs. If Robinson and Sraffa’s criticism is correct, then the Hicksian reformulation of marginal productivity theory, in which consumers substitute away from expensive-factor-goods to less expensive ones and thereby automatically reduce these factors’ prices, falls apart, as there is no guarantee that the substitutions will lower the overall level of demand for these factors.7

Despite these objections, it is highly unlikely that the marginalist model will be abandoned by the mainstream in the near future. Marginalism is a theory that is deeply engrained

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7 See Petri (2013) for a more in-depth analysis of the Sraffian critique.
in the fabric of modern economics, with a wide range of applications that extend far beyond the determination of factor prices. Nonetheless, it is conceivable that the DMP model could eventually serve as a building block for an entirely new paradigm. The model’s recent incorporation into dynamic stochastic general equilibrium models, substituting for the classical marginalist aggregate production function, may be an early sign that it is beginning to play this part (Rogerson et al., 2005).
References


