# WORKING POVERTY: LOW SKILLS OR LOW WAGES?[1]

by David J. Lyon

The distribution of families in poverty across the employment spectrum is shown in Figure 1. The largest fraction, a full 50%, consists of families with at least one full time worker, and the remaining half includes the unemployed that are looking for work, the unemployed that are not looking for work, the retired and the disabled[2].

Families in Poverty, U.S., 2010
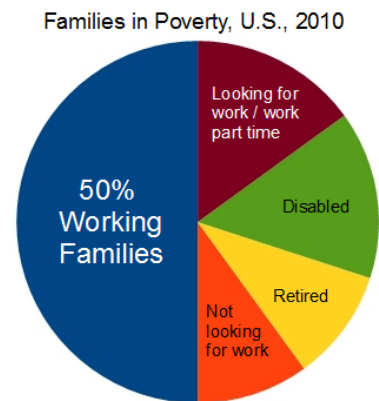
Addressing poverty for some of these groups – seniors, the disabled – seems a natural fit for publicly funded social programs, if a majority of the citizenry want to spend tax money on assistance for those in poverty (and a majority in the U.S. do[3]). But the best approach to addressing poverty for the largest group, the working poor, is less obvious: they are able and they do work, they just don't make enough money to escape poverty. Understanding why their wages are below the poverty line is critical to identifying an effective intervention.

A frequent view amongst researchers and the public at large is that working poverty derives from a lack of skills. This view is based on the assumption, often unstated, that low-wage labor markets are highly competitive, where wages are set at the intersection of the labor supply and demand curves, and workers earn the competitive-market rate based on their contribution to the company, the "value of their labor." If this assumption is correct, then skill development initiatives – job training, job matching services, GED support, higher ed assistance and the like – will not only raise the income levels of participating workers, but also have the potential over time to reduce the percentage of the population in poverty.

But if our low-wage markets are instead dominated by small numbers of large employers, then the exercise of their high degree of monopsony power (monopsony being the single-buyer sibling of monopoly) to push wages below competitive-market rates may be the dominant cause of working poverty. In this case, the main correlate to skills will be *position* on the wage scale, not the actual level of the wage, and skills initiatives alone may not lower the percentage of the population in poverty. Fortunately, raising the minimum wage in this situation can be an effective counter to employers' market power: in monopsony, raising the minimum wage up to the competitive-market wage *increases* employment[4]. And if the competitive wage is above the poverty level, a higher minimum can bring up to half of poor families out of poverty, increasing economic efficiency at the same time.

This question of whether sub-poverty wages are due to skills deficits or to employer market power – and its associated policy ramifications – form the central inquiry of this paper. Competitiveness is explored through three different lenses: market concentration, the response of these markets to change, and measurements of labor supply elasticity. Through each lens, I find the evidence points to a high degree of employer market power, and I attempt to estimate what wages in these markets would be if they were highly competitive markets.

The pure policy implications of monopsonistic low-wage labor markets are both starkly different than they are for competitive markets, and also quite hopeful. Raising the minimum wage up to

the competitive rate increases incomes, employment, and total social surplus; these rising incomes fuel economic growth as well as increased productivity; and higher wages incent more of the currently unemployed poor to rejoin the workforce. If the competitive-market wage is above the poverty line, then a raised minimum directly eliminates up to half of working poverty, without costing taxpayers a dime.

An increased minimum does not even need to have significant impact on consumers: the money to pay increased wages in this market correction comes from corporate profits, the typical cost of increased market competitiveness. But, of course, therein lies the rub, in terms of the *politics* of such a policy, discussed further in the Conclusions section below.

THE WORKING POOR – UNDER-SKILLED OR UNDER-PAID?

Are the working poor poor because "they don't have the skills to produce enough value for their employer to pay them more", or is it because "employers are not paying these workers fair wages (and can we define what 'fair wages' means?)"?

This question is asked in economic terms as "are these low-wage labor markets highly competitive or highly concentrated?" To see why, a quick review of the supply and demand curves for both market types is in order, shown in Figure 2 below. The upward-sloping supply curve shows how many hours workers are willing to supply based on the wage, while the downward-sloping curve is the employers' labor demand curve, showing how much that labor is worth to employers and how it varies with the number of workers hired:
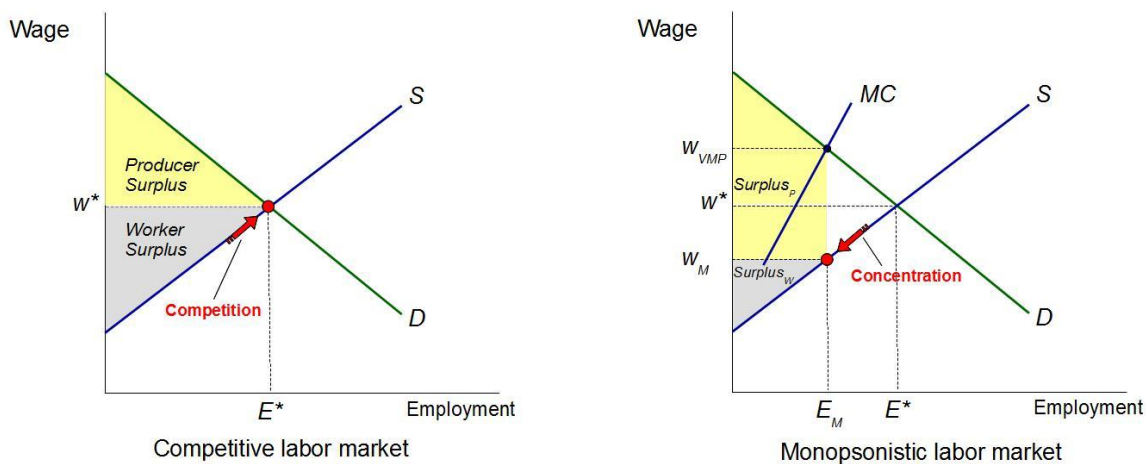
In highly competitive markets (Figure 2a), competition for labor drives wages to the *competitive market wage,* w*, where wages are very close to the value of workers' contribution to the company (this contribution is shown by the employer labor demand curve). This is the situation where workers' incomes *do* correlate closely to their skills, their contribution to the company. So if the main low-wage labor markets are highly competitive, then skills and education make sense as determinants of poverty.

By contrast, in a monopsony (a single employer, Fig. 2b), that employer's market power enables them to pay workers a wage w_m that is significantly lower than the competitive-market wage[5], and even further below their value to the company, w_{vmp}. Notice that in monopsony, not only are wages lower, but output – and thus employment – are reduced as well. With a standard formula and measures of the *elasticity* of the labor supply curve, we can calculate just how much below their value to the company low-wage workers are paid in a monopsony.

And while actual monopsonies are rare, a lot of markets are highly concentrated, including, as we will see below, the industries that employ the most low-wage workers, and these concentrated markets share many characteristics with monopsony. In the section "Market Concentration", we

will use a simple oligopsony (market dominated by a few employers) model to approximate where, in between these two models, the concentrated-market equilibrium lies, based on the percentage of the market controlled by the top few employers. With this refinement, we will be able to use the standard formula mentioned above and measures of supply elasticity to estimate the competitive-market wage based on actual wages.

It is important to note that society does have an economic preference between the market types: output and total surplus (producer + worker) are reduced in monopsony compared to competitive markets, by an amount known as the "deadweight loss," meaning society overall gains more when markets are highly competitive (with a few exceptions). Large employers simply use monopsony power to increase their surplus and profits by taking surplus from workers and from society overall, reducing overall output, employment and economic growth in the process. This lets us see how raising the minimum wage when wages are below the competitive-market rate functions purely as a market correction, restoring economic efficiency and maximizing output while returning the portion of worker surplus that had been annexed through monopsony power.

Clearly, this question of labor market competitiveness is central to efforts to reduce working poverty, pointing to two very different policy avenues based on which model is most appropriate. In the next section we will use key features from each market type to examine the competitiveness of our major low-wage labor markets, and to project what the competitive-market wage would be.

ASSESSING MARKET COMPETITIVENESS

The ostensibly private, free-market character of the changes in the wage structure is an illusion. Relative wages are much more a matter of politics, and much less a matter of markets, than is generally believed. – James Galbraith, *Created Unequal.*[6]

How do we assess whether an input market is closer to the perfect competition model, or closer to the monopsony model? By the way, this is asked surprisingly infrequently: as Alan Manning notes in *Monopsony in Motion*, the amount of space in common economic textbooks devoted to monopsony (monopoly's complement in the buying market) ranges from 0 to 5 percent[7]. Many of these few mentions of monopsony dismiss it almost out-of-hand, as a phenomenon assumed to arise rarely in reality.

We will use three different measures to examine the competitiveness of the U.S.' main low-wage labor markets: the elasticity of the labor supply, the level of market concentration, and the response of these markets to changes. Each of the three will give us a qualitative sense of market competitiveness, and we will be able to combine the first two measures to get a more quantitative estimate of what the wage would be in these markets if they were highly competitive.

LABOR SUPPLY ELASTICITY

The firm-level elasticity of the labor supply – defined as the (percentage) change in how much labor workers are willing to supply given a (percentage) change in the wage – is one of the most direct ways to measure the degree of monopsony power employers enjoy.

In a *perfectly* competitive market, competition for labor drives wages to the competitive-market equilibrium: the presence of employment options increases the elasticity of the labor supply, to the point where each individual firm experiences the labor supply as a horizontal line, infinitely elastic to changes in the wage. With a highly elastic supply of labor, firms cannot pay less than the competitive-market wage, for if they do they will lose workers rapidly.

As a market gets more concentrated, the elasticity of the labor supply goes down, and the equilibrium point moves from the competitive equilibrium (Fig. 2a) to where it rests in Fig. 2b,

decreasing total surplus, reducing total output (Q), and increasing the gap between the wage paid and the value of that labor. This means that these firms *can* pay less than the competitive-market rate and still retain workers; and the lower the elasticity σ, the larger that value-to-wage gap can be[8]:

$$\frac{w_{VMP}}{w_M} = 1 + \frac{1}{\sigma}$$

So if, for example, we decided that "relatively competitive" means that workers are paid at least 85% of their value to their employer, then competitive markets will have supply elasticities over 5. In contrast, values under 1 mean that workers make half or less of the value they contribute.

Good estimates of the labor supply elasticity can be hard to find; Alan Manning described in 2003 the available literature on the topic as "a huge hole in labor economics"[9]. Interest in the issue seems to have increased since then, with recent papers analyzing labor supply elasticity in specific labor markets, and mostly finding relatively low values under 1 or 2[10] [11].

One study that measured firm-level elasticities of the labor supply across a wide range of industries comes from Douglas Webber at Temple University. He found an overall average elasticity of 1.08; signficantly, he also found that the elasticity varies widely across the wage range, with lower values at the low-wage end of the spectrum and higher elasticities at the higher end. He finds that this correlates with wage-setting power: "the effect of monopsony power is not constant across workers: ... impacts are largest among low paid and negligible among high paid workers." [12]

Other economists have similarly found that labor supply elasticity tends to increase with wage[13], and there is a certain logic to it: in general, workers are qualified for more jobs that pay less than they currently make than they are for jobs paying more than they make now, meaning that lower wage workers will have fewer options available. Workers at the lowest end of the wage scale have the fewest options, and, of course, options are what make markets competitive. All of this points to a high degree of monopsony power in our low-wage labor markets, and to that power's role as a cause of working poverty.

We can get a quick sense of the magnitude of that market power from Equation 1, plugging in the most applicable range of the elasticity from Webber's data. Some low-wage workers have an elasticity as low as 0.22, but we will use a somewhat more conservative range based on Webber's values for the food service and accommodation industry, values between 0.4 and 0.6. Using this range, we see that workers in these industries likely contribute between 2.5 and 3.5 times their wage in revenue to their employer.

So, our best estimates of the supply elasticity in the U.S.'s low-wage markets clearly indicate that a significant degree of monopsony power exists in these markets, and is likely a key cause of working poverty. In the sections below, we will assess labor market competitiveness with two more metrics, and use two simple models to approximate what the competitive-market wage would be in these industries, were they less concentrated.

MARKET CONCENTRATION

The industries that employ the greatest number of low-wage workers are the food service and retail industries, which encompass all of the top 25 low-wage employers[14] in the U.S., and which together employ over 3 million low-wage workers:

- Food service: approximately 2 million low-wage workers
- Retail: approximately 1 million low-wage workers

Table X: The Top 25 Low-Wage Employers in the U.S.

1	Wal-Mart	8	Aramark Corp.	15	J.C. Penney	22	Jack in the Box
2	Yum! Brands	9	Starbucks	16	Kohl's Corp.	23	Dollar General
3	McDonald's	10	DineEquity	17	Dunkin' Brands	24	Brinker Int'l
4	Target Corp.	11	Compass Grp.	18	The TJX Cos.	25	Bloomin' Brands
5	Sears Holdings	12	Macy's Inc.	19	Sodexo S.A.		
6	Doctor's Assoc.	13	Wendy's	20	Domino's Pizza		
7	Burger King	14	Darden Rest.	21	Sonic Corp.		

Both are very concentrated markets. The fast food product market is dominated by McDonald's, with 22% market share; the top 5 companies combined (including Yum Yum, Wendy's, and Burger King) control close to half the market[15], at 46%. Retail in 2015 was even more concentrated, with Macy's, Sear's, JcPenney, Wal-Mart and Nordstrom together commanding over 60% of the market[16].

To estimate how much of the pure monopsonist's wage-setting power (Equation 1) these employers have, I use a simple, back of the envelope oligopsony model that assumes the actual wage varies linearly between the competitive-market wage w^* and the pure-monopsony wage w_M, based on the combined market share of the top 5 employers, MS_{top5}. The higher MS_{top5} is, the closer to w_M wages will be (see Figure 3).

Oligopsonistic labor model
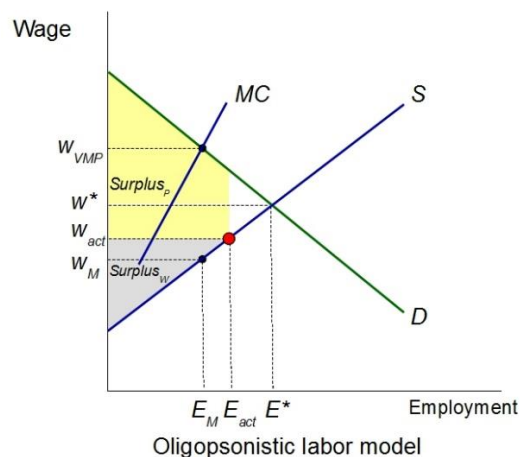
For simplicity, we will assume the wage varies linearly with top 5 market share:

$$w^* - w_{act} = MS_{top5}(w^* - w_M)$$

Thus, we would expect that employers in a market in which the top five held about half the market, would have about half the wage-setting power a pure monopsonist facing the same supply elasticity would have. We will use this in the section "Estimating the Competitive-Market Wage" to refine our projection of what wages would be if these markets were more competitive.

LABOR MARKET RESPONSE TO STIMULI

A final way we will gauge the competitiveness of the low-end labor market is to examine how employment responds to two different stimuli. The first is an increase in the minimum wage. Raising a wage floor in a highly competitive market has the effect most people expect: it moves the supply-demand equilibrium point to the left, lowering overall employment.

Raising the minimum wage in labor markets where employers wield significant monopsony power, however, can have a very different – even the opposite – effect. In concentrated markets, the

increase acts as a direct corrective to the monopsony power in the market, moving the equilibrium point back up the supply curve toward the competitive-market value, *increasing* employment as it does wages.[17]

Several studies have demonstrated this effect empirically – that increases in the minimum wage either have no effect on employment levels, or actually increase employment. The influential Card-Krueger study[18] showed that employment levels *increased* slightly when the minimum wage was increased in one state and not an adjoining one. Several similar studies have found this same result[19].

These results run counter to the conventional wisdom, but only because conventional wisdom is saturated with an implicit belief that most markets are highly competitive. As the Webber and other studies of labor supply elasticities show, low-wage labor markets are not competitive, but rather are highly concentrated with significant amounts of monopsony power. Fortunately, awareness in the media of the problem of market concentration seems to be growing, examples including the *Economist's* comment that rising U.S. profits, "coupled with an increasing concentration of ownership, ... means the fruits of economic growth are being hoarded"[20], and the New York Times' declaration that "... mergers and acquisitions have increased the market power of big corporations ... hurt consumers and is probably exacerbating income inequality"[21].

The second event we examine is the response of overall employment levels to a significant increase in labor market concentration. Whereas the first stimulus, above, showed how employment in an already-concentrated market responds to an attempt at correction (the increase in the minimum wage), the second stimulus comes to a labor market that is reasonably competitive before the stimulus. David Neumark, Junfu Zhang and Stephen Ciccarella studied effects on employment and earnings from the opening of a Wal-Mart store. Since many of these store openings are in rural areas (most were in rural areas in the company's early expansion), they amount to a significant increase in employer concentration in a short period of time. The researchers found that for every job Wal-Mart created, it displaced 1.4 other regional jobs, reducing average retail employment by 2.7 percent[22]. Again, this is the behavior one would expect from the observation that the entry of a Wal-Mart store into a rural area increases employer concentration in the retail sector.

In summary, all three lenses we have used to assess the competitiveness of our low-wage labor markets point to these markets having significant degrees of monopsony power. The most direct measure, the elasticity of the labor supply facing an individual firm, appears to be well under 1 in these markets, and to trend downward with decreasing wage. The high level of market concentration in the two biggest low-wage markets, fast food and retail, where the top five firms control about half the market, is another such indicator. And the way employment levels in these markets respond to changes, changes in either the level of concentration or the minimum wage, also points clearly to significant levels of monopsony power. All that remains is to estimate the magnitude of wage suppression this power enables and, thus, how much of a contributor to working poverty it may be.

ESTIMATING THE COMPETITIVE-MARKET WAGE

To estimate what wages would be in these industries if the markets were highly competitive, we need one more relationship to be able to express $w*$ in terms of w_{act} , and we will need estimates for the average actual wage w_{act} in these markets.

This additional relationship gauges where $w*$ falls between w_{vmp} and w_M , using the assumption that the supply and demand curves are linear:

$$\frac{w_M}{w^*} = MCWR = \frac{1 + \sigma - \epsilon_D}{1 + \sigma - \epsilon_D - \frac{\epsilon_D}{\sigma}}$$

where MCWR stands for the monopsony-to-competitive wage ratio. Good data on employer labor demand elasticity, ϵ_D, can be difficult to obtain; values found in other industries indicate a likely value close to -1. Using this value and combining the MCWR with our oligopsony model (Equation 2), we can relate the actual wage workers are paid to what the competitive-market value would be:

$$\frac{w_{actual}}{w^*} = 1 - \left(\frac{MS_{top5}}{\sigma}\right)\left[\frac{1}{2 + \sigma + \frac{1}{\sigma}}\right]$$

So with concentrated markets like fast food and retail, where we use the fairly conservative range for σ of $0.4 - 0.6$, we'd estimate that the actual wage paid is between $75 - 80\%$ of the competitive-market wage. Thus the average wage of \$9.09 / hr in the fast food industry[23] indicates the competitive market would be about \$11.10 − \$12 / hr. The 3-person family poverty level is right about \$11.30 / hr[24], meaning that a minimum wage set to the competitive-market value could bring the full-time working poor out of poverty.

	Symbol	Value / Range
Actual-competitive wage ratio	$\frac{w_{actual}}{w^*}$	75% − 80%
Competitive low-end wage rate in fast-food market	w^*	\$ 11 / hr − \$ 12 / hr

It is worth noting that these estimates would benefit from more detailed information, especially on supply and demand elasticities, to fill in where I have made assumptions. While more accurate values may be greater or smaller than those used here, overall, I expect that the projections for competitive-market wages are on the conservatively low side, given the design of the model I have used. The *firm-level* values of labor supply elasticity I have used are plugged into the value-to-wage ratio for *pure monopsony*. I then compensate for the presence of multiple employers by reducing that ratio by the market share of the top five. But a true monopsonist would face an even lower supply elasticity, and that would be the value properly used in the formulas above. That in turn raises the projection of the competitive-market rate, leaving us reasonably confident that our current estimates provide a lower bound.

PAYING FOR THE COMPETITIVE-MARKET WAGE

Our conventional wisdom tells us that the cost from an increase in the minimum wage would have to be borne by consumers via higher product prices, or by workers via fewer jobs. But in concentrated markets, the increased cost can come mostly or entirely from corporate profits, profits that arose in the first place from the exercise of monopsony power.

Is there enough profit in these concentrated low-wage industries to cover the cost of raising the minimum wage to the competitive-market rate? As we saw above, the data in the fast food industry point to a competitive-market wage of \$11.10 - \$12 /hr. Taking the conservatively high number of \$12 /hr, the cost in additional wages to an employer would be around \$5,820 / year per employee to bring their wages up from the current average \$9.09 /hr (assuming the average employee works a 40 hour week). The profit impact on a few of the largest low-wage employers is tallied here:

Employer	# of employees	Annual profit [year] (in $millions)	Cost to bring employees to $12/hr (in $millions)
McDonald's[25]	420,000	$4,529 [2015]	$2,444
Burger King[26,27]	34,250	$1,912 [2015]	$199
Wal-Mart[28,29]	1,400,000	$14,700 [2016]	$5,460

(Note that average wages in retail trade are almost $1/hr higher than in fast food, giving Wal-Mart a lower per-employee cost to bring wages to $12/hr). As we can see, the top low-wage employers do appear to make enough profit to bring all employees up to $12/hr or higher. Although for some – Wal-Mart and McDonald's in particular – it amounts to a sizable fraction of their profit.

CONCLUSIONS

RAISING THE MINIMUM WAGE TO THE COMPETITIVE WAGE CORRECTS A MARKET FAILURE: WORKING POVERTY

We have seen that the competitiveness of low-wage labor markets in the U.S. is really quite low – as measured directly by labor supply elasticities as low as 0.22, as anticipated by the high degree of concentration in those markets, and as exhibited by employment remaining stable or increasing following an increase in the minimum wage. All three point to a high degree of monopsony power, and – within the limits of the available data and of my models – to its significant negative impacts on wages and employment.

The economically efficient and societally optimal policy response is to raise the minimum wage to the competitive-market wage. Estimating this wage from the models above, factoring in measured labor supply elasticity, estimates of demand elasticity, and market share, indicates that the competitive-market wage for the fast food industry – and perhaps for other low-wage industries – is between $11.10 / hr and $12 / hr. This *equals or surpasses the hourly wage needed to escape poverty* for a family of three ($11.25 / hr), assuming fulltime work (40 hours per week). Correcting this market failure can thus eliminate a large portion, possibly a very large portion, of working poverty in the U.S. It is a choice that would be fully grounded in economic science, in the importance of competitive markets, and in the sense of fairness that our culture prizes.

TRANSITIONING TO COMPETITIVE LABOR MARKETS

As noted earlier, correcting the market failure of monopsony power in low-wage labor markets optimizes social benefit, increasing total surplus, economic growth, employment and wages. But it does cost one stakeholder group, the employers (and their investors), and it is important to understand the ramifications.

From an economic point of view, market failure in these markets means that they are not guiding investment toward overall social benefits. The accrual of monopsony power enables businesses to increase profits – by about 50% and 100% in the cases of Wal-Mart and McDonald's by our estimates – and quite possibly enables them to do so more quickly than by other means. But this comes, as we have seen, at the expense of overall social benefit. Given the high percentage of profits that seem to be due to this wage-setting power, this implies that, without monopsony power, these industries are intrinsically rather low-margin industries, and there is a logic to that conclusion.

Many of the main low-wage industries are point-of-service businesses that are intrinsically local, and have little inherent return to scale. There are typically some returns to scale as they grow within their local community, and even to the regional level. But beyond that, the nature of the business model provides little opportunity for scaling – especially compared to industries like manufacturing – unless growth is used to accumulate and exert monopsony or monopoly power. And as we have seen, profit simply annexed from worker or consumer surplus is a win-lose-lose scenario: investors win; workers lose with lower wages, or consumers lose with higher prices; and society loses with less employment, decreased overall output and lowered economic growth.

So while it is important to increase the minimum *gradually* to the competitive-market wage in order to protect investors from dramatic losses, this market correction is a valuable re-direction of that investment toward markets where high investor returns can coexist with maximum societal benefit (i.e. where there are true economies of scale, or where product innovation is central).

From a political point of view, the issue is of course the ability to actually enact such a raise to the minimum wage. For one, large, highly profitable corporations have considerable power to influence policy making through lobbying, and can hardly be expected not to use it. For another, the conventional wisdom currently tends to view working poverty as an individual failing, with less appreciation for the systemic forces at work. So grassroots efforts to increase public awareness of the role of market concentration in the phenomenon of working poverty are critical, and not without hope: while efforts viewed as "government handouts" often prove a tough sell, voters are much more likely to support policies that ensure "fair wages."

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[1] This is an Original Manuscript of an article published by Taylor & Francis in *Challenge: The Magazine of Economic Affairs* on February 5, 2018, available at
http://www.tandfonline.com/doi/full/10.1080/05775132.2018.1426082

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market rates, but range from w_m to w^* according to each worker's reservation wage (see Borjas). Overall employment level in a price discriminating market stays the same as it would in a competitive market.

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