

Wages vs. Ownership: Which is more efficient for the firm?

by Dan Weltmann

Efficiency wage theory suggests that paying workers above the market or minimum rate can be more efficient for the firm, since the increased productivity more than pays for the increased wages. And yet, workers can be paid in stock, not just wages, and the two forms of compensation may motivate workers in different ways, leading to different outcomes, as well as affecting cash flow in different ways. Employee ownership as a form of efficiency wages has not been examined before, and given its potential to affect employee attitudes and behaviors as well as firm performance, it is worth investigating. Using data from employee surveys matched to average wages for comparable workers outside the firm, I examined both an objective measure of worker pay relative to the market and a subjective measure of workers' perception of pay relative to the market. The general finding is that when wages were perceived as being below market, higher wages had a positive effect on a number of performance-related attitudes, but ownership did not. For wages above market, in contrast, ownership had positive effects on a number of attitudes. Whether the wages were below or above market, the employees' perception of their pay relative to market pay was more important than what they were actually paid, which may reflect better information workers have about competitor local wages and conditions of employment. The results indicate that employee ownership may act like efficiency wages in some important respects, and may complement efficiency wages by having stronger effects when wages are above market.

Keywords: efficiency wages, employee ownership, firm performance

INTRODUCTION

Motivating Workers through Efficiency Wages

There is an apocryphal story in which a worker is complaining about his wages to the boss, who responds by pointing out the window and telling the worker that he can either accept his wages, or he can join the unemployed outside the factory gates, lining up for a chance to take his job and his wages. Marx (1847) described this concept when he said that “(...) industry constantly requires a reserve army of unemployed workers (...) to have the commodity labour as cheaply as possible (...)” While Marx’s “reserve army of unemployed workers” were likely local to the factory environs, thanks to globalization, that army is now global, and the threat to higher wages that much greater. And yet, a modern basis for this idea comes from efficiency wage theory (Akerlof & Yellen, 1986; Katz, 1986; Stiglitz, 1984; Yellen, 1984), which argues that the boss’ threat in the above story may not be necessary when workers are receiving higher pay than they could on the outside (either unemployed or employed at another firm). The employer does not want to lower wages because that would worsen worker behaviors, and the resulting losses in productivity for the firm would exceed any savings in labor costs. Wages are, however, only one kind of compensation; another is employee ownership, which has not been studied in the context of efficiency wage theory. Because wages and ownership may motivate employees in different ways, leading to different outcomes for the employees and the firm, the role of ownership as a possible form of efficiency wages was investigated in this study.

Understanding why wages are higher than they need to be (meaning, higher than the equilibrium or market rate) matters for theoretical as well as practical reasons. The greater efficiency of higher wages may make the firm more profitable through a variety of mechanisms,

such as better hires, more motivated employees, and lower turnover. It matters for ethical reasons too: higher wages can be interpreted positively as the creators of wealth—the workers—keeping a greater share of the wealth they create for themselves; alternatively, higher wages can be interpreted negatively as a cause of unemployment because when the firm pays higher wages it may higher fewer workers and contribute to unemployment in a labor market equilibrium.

Causes for Wage Variation

There is a substantial literature dealing with the concept of efficiency wages, including an excellent overview of the field by Groshen (1991), who discusses five reasons why wages vary amongst employers:

1. Employers systematically sort workers by ability;
2. Wages vary because of compensating differentials;
3. Costly information generates or perpetuates random variations in wages;
4. The efficient wage for some employers is above the market rate;
5. Workers inside firms exercise a claim on rents.

What makes the fourth reason—efficiency wages—stand out is the implication that employers will pay higher wages than they have to (the market rate), because they want to do so. While employee ownership can be a component of compensation in all five reasons for wage differentials, employee ownership shares an important characteristic with efficiency wages: both are used by the employer to elicit certain employee behaviors, with the aim of improving firm performance.

The literature on efficiency wages is significant, with certain key contributions by two winners of the Nobel prize in economics, George Akerlof and Joseph Stiglitz, (Akerlof, 1984; Akerlof & Yellen, 1986; Shapiro & Stiglitz, 1984; Stiglitz, 1984) discussing these five reasons for the existence of efficiency wages:

1. Avoid shirking—employees work harder out of fear of getting fired;
2. Minimize turnover—workers are less likely to quit and take another better paid job;
3. Adverse selection—higher wages attract job applicants of a higher caliber;
4. Sociological theories—higher wages lead to higher morale which raises productivity;
5. Nutritional theories—poor workers get to eat well enough to avoid illness and can work harder and more productively (relevant primarily in poor countries).

Efficiency wage theory's appeal is its power to explain wage rigidities (i.e., why wages do not drop toward the market rate) (Stiglitz, 1984) and wage variation (i.e., why wages vary among firms for the same job types) (Groschen, 1991). Given a variety of possible causes for wage differentials, a number of studies have been conducted that advance evidence for the existence of efficiency wages (Cappelli & Chauvin, 1991; Hesford & Pizzini, 2014; Holzer, 1990; Levine, 1991; Levine, 1992; Wadhvani & Wall, 1991). Of particular interest is Peach & Stanley (2009), who conducted a meta-analysis of 75 estimates of the efficiency-wage effect and found a strong positive effect even after controlling for simultaneity and publication bias. While these studies put efficiency wage theory on firm empirical ground, none have considered the possibility that efficiency “wages” do not have to be literally wages, but may include ownership. So why consider it?

Employee Ownership

While efficiency wage theory says that employers *pay* their employees more so that they will behave better, employee ownership research says that employers give their employees *ownership* so that they will behave better. Kruse and Blasi (1996) conducted a review of over 70 empirical studies on the effects of employee ownership over the previous 25 years, and a meta-analysis of productivity studies. These studies covered:

1. Employee attitudes and behavior;
2. Firm performance;
3. Employment stability, growth, and firm survival;
4. Employee wealth and wages.

The main findings from these studies and several since then have been that:

1. Employees have more satisfaction and commitment when they become owners (Blasi, Kruse, & Bernstein, 2003);
2. Productivity improves when an Employee Stock Ownership Plan (ESOP) is adopted and the productivity improvement persists in subsequent years (Kruse, 2002), though to obtain these productivity improvements structural changes need to be implemented to get employees to become more involved in the kind of activities that impact those factors (Blasi, 1988; Logue & Yates, 2001; Logue & Yates, 2006);
3. At firms with significant levels of employee ownership, employment tends to be more stable and even grow (Logue & Yates, 2001; Quarrey & Rosen, 1993; Winther & Maren, 1997), and firm survivability is higher (Park, Kruse, & Sesil, 2004);

4. Lastly, since most employers issue stock on top of regular compensation (only a minority of employers issue stock in place of some of the wages) employee-owners are likely better compensated than their stockless counterparts at comparable jobs (Blasi & Kruse, 1992).

There are potential downsides to employee ownership, such as encouraging employees to put all their investment eggs in one basket (the stock of the company they work for, thus increasing risk), and possibly creating conflict by giving employees a voice when their interests diverge from those of management. Overall, however, according to the studies cited above, the relationship between employee ownership on one hand and employee behaviors and firm performance on the other is either neutral or positive; usually, the latter. Lastly, employee ownership does not function in a vacuum; major studies have shown that to get the largest positive effects from employee ownership it is important to get the culture right (Blasi, Freeman, & Kruse, 2013) and to implement the appropriate human resources practices, such as training (Kruse, Freeman, & Blasi, 2010).

Employee Ownership vs. Wages

Prior research is clear on the positive effects of both efficiency wages and employee ownership, on both the employees and the firm. The two approaches to improving employee behavior and firm performance have striking commonalities: both involve compensation as a tool, with efficiency wage theory focusing on wages, and employee ownership focusing on stocks. And yet, despite the similarities, the possible function of employee ownership as an efficiency wage has not been investigated. Given the research on employee ownership, which

shows that ownership is a powerful motivator (Blasi et al., 2003), it is important to efficiency wage theory, and to practical decisions to be made by managers regarding the type and level of compensation, that the function of employee ownership as an efficiency wage be investigated. The decision on how to compensate employees has this practical aspect: raising wages affects cash flow negatively while conserving ownership, whereas granting stocks through ESOPs does not commit the firm to higher on-going wage payments and may positively affect a firm's cash flow.

It is also worth noting that wages have been stagnant for thirty years, while stock ownership is highly concentrated with half of American households owning none (Blasi et al., 2013). Under current and expected economic conditions of intense globalization and all that it entails regarding a likely race to the bottom in wages, the importance of employee ownership becomes more apropos because it can be used to reward employees at reduced cost to the company compared to direct wages (through ESOPs). Furthermore, as nominal wages rise while real wages stagnate, the perception of wages by employees may differ from their actual wages (employees may believe they are paid more or less than the market), and this difference between perception and reality may have different effects on attitudinal variables. Therefore, this research looks not only at wages, but also at how they are perceived, when compared to ownership.

THEORY

The time has come to extend efficiency wage theory to employee ownership. When efficiency wage theory was first developed, stock-oriented performance-based pay was less common among workers, and in fact was far less common even among executives and senior

managers. That began to change after Jensen & Meckling's (1976) landmark paper, which used agency theory to argue in favor of compensating executives with stock options, so as to maximize shareholder value; Jensen publicized the idea in a series of articles he wrote in 1990, arguing that executives should not be paid like "bureaucrats", meaning fixed wages irrespective of firm performance. The concept of incentivizing through stock spread and broad-based employee equity was applied to employees in the 1990s in the high-tech industry and later in Internet-related firms (Blasi et al., 2003). These trends in stock-based compensation were supported by Federal law which created ESOPs in 1974 and led to a doubling of ESOPs in the 1980s to over 10 million (Blasi & Kruse, 1991). In 2002, Blasi, Kruse, and Freeman decided to document this national phenomenon by applying to the National Opinion Research Center at the University of Chicago to do a measurement of the phenomenon in the General Social Survey (GSS), which is a random sample of all adult workers. The GSS data show that 21% of all adult American workers had some stock holdings in their company while 13% held some company stock options (Kruse et al., 2010), thus making it clear that insider corporate stock ownership had spread to millions of American workers at some level and was indeed quite broad-based. Moreover, they found that almost half of all adult workers had some form of performance-based pay (employee stock ownership of some kind, employee stock options, profit sharing, or gain sharing).

As this trend in stock-based compensation has broadened, especially in certain industries, it makes sense to consider how incentivizing workers through equity may yield efficiency effects, while also considering the efficiency effects of wages themselves. Below is a review of how the four versions of efficiency wage theory relate to broad-based employee ownership and

the current study. The nutritional version is not addressed because it is not likely to apply in developed countries.

Four Versions of Efficiency Wage Theory

1. The moral hazard or “shirking” version of efficiency wage theory: When ownership is provided on top of market-level wages, employees may want to keep the job where they are getting this ownership so they will work harder. The current study has relevant data on work effort and performance-related attitudes.
2. The turnover version of efficiency wage theory: When ownership is provided on top of market-level wages, workers should be less likely to leave. Apart from the direct effect of higher total compensation, employee ownership may have an additional effect on turnover by building worker identification and loyalty to the company and fellow workers. The current study has data on turnover intention.
3. The adverse selection or “attraction” version of efficiency wage theory: Ownership may be attractive to job applicants, either as a form of higher compensation or for its potential to foster a different type of workplace culture. The current study does not have information on job applicants, and the data on worker quality are not adequate to shed light on this version of efficiency wage theory.
4. The gift exchange or reciprocity version of efficiency wage theory: If ownership is viewed as a "gift" from the company to the worker, which is especially likely if it comes on top of market wages, this can create higher morale and worker effort norms. While this may happen due to the direct effect of higher compensation, it may be enhanced by taking the form of ownership shared with fellow workers that creates a normative change

in the entire workplace that is focused on greater cooperation to produce better work. In other words, ownership may especially increase norms of reciprocity among fellow workers and between workers and the firm, consistent with Akerlof's gift exchange theory of efficiency wages. The current study has measures of perceptions of employee-management relations that can shed light on this theory.

The Market Wage and Employee Ownership

It is unlikely that the effect of employee ownership is independent of the wage being paid because, while one may dream of becoming "rich beyond the dreams of avarice" (Moore, 1771), preferably by doing nothing while watching the value of one's shares soar on the wings of the latest stock market bubble, one must first tend to life's basic needs, such as putting a roof over one's head and being able to afford food; this is what Maslow referred to as physiological needs (Maslow, 1943). That is why it is not realistic to expect employee ownership to have much of an impact on employee behavior when wages are too low; one cannot pay the rent with stock that might vest years down the road, and substituting stock of unknown future value for badly needed wages, in an attempt to save cash by the employer, might be seen negatively by the employee. The threshold above which employee ownership can begin to make a difference is unknown, but a good place to start might be the market wage: below it, wages are likely to motivate the worker by virtue of being badly needed, whereas above it, basic needs are likely to have been met and longer horizons can be contemplated, so that employee ownership may be more likely to motivate the worker.

Here I would like to make an argument that, once wages are high enough, even though the literature shows both wages and ownership to be motivators, ownership should provide the stronger motivator, which would imply that one extra dollar in ownership should yield better outcomes than one extra dollar in wages. Ryan & Deci (2000) provide an excellent review of the definitions of intrinsic and extrinsic motivations; Cognitive Evaluation Theory (CET) specifies “the factors in social contexts that produce variability in intrinsic motivation”. The theory, which has been confirmed both in the lab and in the field, explores the issue of how rewards motivate, and their meta-analysis (Deci, Koestner, & Ryan, 1999) “confirms that virtually every type of expected tangible reward made contingent on task performance does, in fact, undermine intrinsic motivation.” Ownership may be less likely than wages to undermine intrinsic motivation for two reasons: 1) monthly wages are a more tangible reward than stock that may be granted yearly and may vest years down the road; and 2) while both wages and ownership may both be contingent on task performance, the value of wages is fixed, whereas the value of ownership may very well go up (it is hoped) over the years as the value of the firm’s shares appreciate, and this future component of the value of ownership is minimally contingent on the task performance of the individual worker. Therefore, while both wages and ownership provide motivation, ownership is likely to undermine intrinsic motivation less than wages do. The expectation that, as compensation rises, ownership may be a better motivator than wages fits in well with a stream of research that shows that the psychological benefits of higher incomes tend to plateau around \$60,000 to \$75,000 per year (Kahneman & Deaton, 2010), leaving open the possibility that ownership continues to provide a superior motivator even when far in excess of such incomes. It is a possibility worth considering because, as wages fulfill certain needs low on Maslow’s

hierarchy, ownership may well fulfill those higher up, such as by contributing to meaningful work that fulfills needs for belonging and self-actualization.

The above considerations, that ownership and wages may have different effects depending on whether wages are below or above market, i.e. that employee ownership is at least as powerful a motivator as wages after basic needs have been met through market-level wages, lead to the following hypotheses:

Hypotheses:

Hypothesis 1: Given compensation at or above market, employee ownership will be associated with comparable or better employee attitudes and behaviors than those associated with higher wages.

Employee ownership may, however, be less effective when workers sacrifice pay so that ownership substitutes for wages. This leads to the second hypothesis:

Hypothesis 2: Given wages below market, increases in wages will be associated with better attitudes and behaviors than those associated with employee ownership.

METHODS

Efficiency wage theory predicts that raising wages above the market rate should make the firm more efficient. If employee ownership functions as an efficiency wage, this should be testable by comparing the effect of wages with the effect of ownership on employee behaviors

and firm performance. This study proposes to find the efficiency effect of employee ownership by comparing compensation consisting of wages vs. ownership. Employees with similar job types and similar levels of compensation are compared within one large firm with about two hundred different sites. This controls for other sources of wage variability and allows for identifying the efficiency wage effect.

Data

The data are available from the National Bureau of Economic Research (NBER) dataset collected by Professors Blasi and Kruse. The data describe employee behaviors and attitudes such as turnover, absenteeism, job satisfaction, loyalty, innovation, giving suggestions, shirking, and anti-shirking. In this thesis I am using data from a large manufacturing company with operations spread across the U.S. My data come from surveys answered by 10,000 workers grouped into eight occupations: production, administration/support, professional/technical, sales, customer service, engineering, scientist, management. The market rate for wages in different occupations is needed to calculate efficiency wages (efficiency wages are relative to the market rate). Those numbers come from the Bureau of Labor Statistics (BLS), which puts out the American Community Survey (ACS); it has wage data by job type, industry, and state. This is a yearly survey with several tens of thousands of respondents within each state.

The definition and operationalization for all the dependent, independent, and control variables were summarized in Table 1. There were four independent variables:

- ObjWage (earndiff)—objective wage, or yearly wages divided by market wages; the market wages from the ACS include all cash payments, including bonuses.

- SubWage (fixedpct)—subjective wage, or the ratio of yearly wages relative to market wages, as perceived by employees.
- EOtoMarket (eorelative)—total employee ownership per year relative to market wages.
- EOtoWages (eopay)—total employee ownership relative to yearly wages.

There were ten dependent variables for employee attitudes and behaviors: Loyalty (loyaltyr), WillToWork (willworkr), JobSeeking (lookhard), CompanyFairness (cofair), GoodWages (grdwage), GoodBenefits (grdben), SenseOfPurpose (grdpurp), TrustInCompany (grdtrust), AccurateInformation (grdaccr), and GoodRelations (grdrel).

Certain variables could be used to test specific versions of efficiency wage theory:

WillToWork could be used to test the shirking model of efficiency wage theory, JobSeeking could be used to test the turnover model of efficiency wage theory, and GoodRelations could be used to test the gift exchange model of efficiency wage theory.

Lastly, thirty control variables were used: Gender (female), Age (age), AgeSquared (agesq), MaritalStatus (married), Divorced (divsepw), SomeCollege (smcol), AAdegree (aa), Bachelor (ba), Graduate (grad), Hispanic (hisp), Black (black), Asian (asian), Native (native), Disabled (disab), Admin (admsupp), ProfessionalTech (proftec1), Sales (sales), Service (custserv), LowMgt (lowmgt), Midmgt (midmgt), UpMgt(upmgt), Hourly (hourly), Supervisor (supervis), Tenure (tenure), TenureSquared (tenuresq), Hours (hours), Union (union), BonusPay (indpay), EmpInvolvement (ei), Training (train), and JobSecurity (joblose).

I performed OLS regressions of each dependent variable (10 total) on one ownership variable (between the 2 available), one wage variable (between the 2 available), and the control variables (30 total). With ten dependent variables and four permutations of the ownership and wage variables, there were a total of forty regressions to run. This was done for the entire dataset, as well as for wages above market and below market, for a total of 120 regressions.

RESULTS

Table 1 displays the variables used and Table 2 displays a summary of significant relationships. The most striking finding is the nearly complete lack of impact that employee ownership has on attitudes and behaviors when wages are below market; there was only one weakly-significant relationship between loyalty and total ownership as a percent of pay. This is a very clear message that, when wages are low, a firm should raise them before considering ownership; this is not to say that ownership is bad when wages are low, but simply that it is not likely to be very motivational when one has difficulty affording the basics of life.

The next important observation is that the perception of wages relative to market is much more likely than the objective measure of wages relative to market to have a positive effect on attitudes. This is particularly so when pay is below market, where all 20 of the estimated coefficients are strongly significant, whereas when pay is above market only 12 of the 20 coefficients are strongly significant. In the relatively few cases where there was a strongly significant relationship between the objective wage measure and attitudes (for 3 coefficients when pay is below market, and 4 coefficients when pay is above market), the relationship between the perception of wages and that particular behavior was usually as strong or stronger,

again underscoring the importance of perceptions. The main occasion when the objective wage measure was significantly related to a behavior was when the employees were asked whether the company pays good wages; in this case, the better the wages, the more the employees said the wages were good, so it is not clear whether this reveals anything of substance.

At above-market wages, for attitudes about the company such as attachment or identification, certain attitudes—loyalty, trust in company promises, perception of the company as being fair—were driven primarily by ownership; that is, the more the employees owned of the company, given above-market wages, the more they were loyal to it, trusted its promises, and saw it as fair, with almost no relationship between those attitudes and wages.

For most of the rest of the behaviors studied, at above-market wages, complementarities appeared between wages and ownership. Sufficient wages were clearly necessary, since ownership did not matter when wages were below market. Above market, wages still mattered, but so did ownership, for behaviors such as willingness to work hard, perception of wages and benefits, creating a sense of purpose, the sense that the company is giving accurate information, and relations between employees.

The main exception was turnover intention; below market, the perception of wages mattered, while when wages were above market, there was some modest effect of stock ownership. It seems that to lower turnover intention, raising low wages helps, and past a certain point people will look for work for reasons largely independent of wages or ownership.

Significant Correlations

Certain correlations were worth noting, such as -0.36 between job security and the intention to look for work, which makes sense: the less job security one has, the more likely one is to look for work. A correlation of 0.60 between benefits and wages is reasonable, as higher wages are likely to involve more benefits. Accurate information had a 0.63 correlation with sense of purpose, suggesting that better information motivates employees. A correlation of 0.68 between accurate information and trust in the company also suggests that openness builds trust. Good relations and a sense of purpose had a correlation of 0.69, which also makes sense—the former are important to the latter. Good relations and accurate information had a correlation of 0.66, another sensible relationship. Company fairness had a correlation of 0.51 with a sense of purpose, which makes some sense as a positive view of the company may help build a sense of purpose. Company fairness had a correlation of 0.58 with trust in the company, which again make sense, since they're both positive views of the company. Accurate information and company fairness had a correlation of 0.50. Good relations and company fairness had a correlation of 0.58. ProfessionalTech had a correlation of 0.51 with hourly, suggesting the type of employment likely for certain types of positions. Loyalty had strong correlations with a range of other attitudinal variables: 0.43 to willingness to work hard, -0.44 to job seeking behavior (negative, indicating less likelihood of looking for work), 0.47 to company fairness, 0.33 to good wages, 0.47 to sense of purpose, 0.49 to trust in the company, 0.43 to accurate information, and 0.49 to good relations; this suggests that building loyalty amongst the employees is of tremendous importance to the company. There were in fact many correlations between the

attitudinal variables, suggesting that a number of positive views of the company tended to go together.

DISCUSSION

Hypothesis 2 stated that the effect of employee ownership on attitudes and behaviors would be minimal when wages are below market, and it was validated rather strongly. Hypothesis 1, which stated that ownership would have positive effects when wages are above market, was also validated for most behaviors when employee ownership was measured as the total employee ownership stake relative to pay. For some attitudes, having to do with attachment to the company (such as loyalty, trust, and the perception of the company as fair), ownership was more important than even the perception of wages.

This lack of relationship between ownership and attitudinal variables when wages are below market contrasts with the general understanding of the high-tech sector, where startups often have below-market wages coupled with generous employee ownership, and yet those employees are very motivated. There are two possible reasons for this (aside from the employees simply liking the job and the environment they are in): unlike in most established industries in which company stock value is fairly stable, stock in high-tech startups is expected to rise sharply in value, typically at an IPO at the end of a period of hard work dedicated to making a specific product. The expected value of the employee ownership stake may be very high in these companies, providing more motivation. The other reason is that even when wages are below that particular market, they may be significantly above the cost of living (an entry-level programmer

makes three or four times as much as a minimum-wage worker), which means that the employees can in fact afford to wait for the promise of higher future stock values.

Research Implications

Regarding the importance of perceptions of wages when wages are below market it is important to be careful about certain implications. This finding does not mean that one can simply “fool” low-paid workers into believing their pay is higher than it actually is; more likely, there are aspects of compensation not captured by the Census Bureau’s survey, such as medical plans and pension plans, and also conditions of employment. These things may be known to the workers surveyed as part of the NBER Shared Capitalism dataset but not to the researchers, and they would not be captured by the wage variable. In these data the workers in the studied company had generous benefits in the form of medical and pension plans, but the extent of medical and pension plans among workers in the Census Bureau data is not known. Workers in the surveyed company may report a “perception” that their wages are above the reported Census-collected data for their local market, when in fact, their self-reported wages are below the U.S. government data for their local market. Company employees may be aware that wage rates were higher in comparable firms but benefits and conditions of employment were worse.

Practical Implications

The above results have certain interesting implications for worker cooperatives. Worker cooperatives are often common in retail industries that do not pay high wages. Workers often have to use their own savings to help start or finance these firms. This research suggests that such a strategy is likely to backfire through lower motivation, and that a better strategy might be

to finance the purchase of the firm through credit rather than employee savings, which should help maintain those wages at a healthier level, while providing ownership on top of those wages, with all the complementarities that ensue between the two when wages are high enough.

This research also has relevance to employee buyout situations where workers sacrifice wages or benefits or flexibility in work rules in order to receive employee ownership through stock to try to save or restructure the firm. Again, the general message to companies is not to substitute ownership for wages if wages are too low because it is unlikely to have an effect on employee attitudes and behaviors; when wages are too low, the thing to do is to raise those wages. Once wages are high enough, employee ownership begins to make sense, and in fact it has a strong effect in complementing the effect of above-market wages on a number of behaviors, while likely cementing the employees' attachment to their company.

It is also worth noting that ownership carries lower risk compared to wages in the following sense: when speaking of efficiency wages, the wages are paid first with the efficiency to follow through increased worker productivity, or so it is hoped. With ownership however, the "efficiency" reward comes later after there is evidence that such effect exists, i.e. when increased stock price reflects increased productivity, and that is when the employee is actually rewarded.

Research Limitations

With survey data there is always the issue of response bias, and that was likely the case with sensitive questions regarding turnover intention, absenteeism, stock ownership, etc.—not everyone answered every question. Despite these limitations, the NBER dataset is large at over

ten thousand respondents, and it covers four industries and eight job types, all of which should produce results that generalize well.

Another limitation is the issue of causality: just as higher compensation may cause employee performance to improve, conversely better performance may be better compensated. While the cross-sectional data in the NBER dataset cannot answer this question, longitudinal research supports the notion that better compensation causes better performance (Hesford & Pizzini, 2014).

One limitation that may understate the findings is that the market wages obtained from the American Community Survey which were used to calculate efficiency wages may themselves contain an efficiency effect, thus rendering the results of this study very much on the conservative side.

Future research

For firm performance, it would be valuable to test these results using financial variables such as sales growth, on-time delivery percentage, number of accidents, etc. Harder measures would provide a stronger test of the efficiency effects of employee ownership. To establish a stronger case for causality, longitudinal data on changes in wages, ownership, and performance would be especially useful.

Another important analysis is which combination of wages, profit and gain sharing, and employee ownership (i.e., granted stock or stock options) results in the greatest efficiencies as measured by employee behavior and attitudes or firm performance.

This company had around 30,000 employees, most of them in the U.S. It is possible to get market wages from the ACS by town and county for all the factories and work sites of that company to make the study more precise.

For this company, many work sites or factories also contains answers from over 80% of workers and supervisors at a particular work site or factory; thus, one could compute a close to actual ratio of workers to supervisors, and this could be combined with the measure of how closely workers believe they are supervised to see if closeness of supervision is related to pay as predicted by the shirking version of efficiency wage theory. Agency theory suggests that increased employee ownership should reduce the need for monitoring, thus resulting in efficiencies through the hiring of fewer supervisors.

The Kahneman & Deaton (2010) study found that psychological benefits plateau at an annual income of around \$75,000; future research could extend the current study and explore whether ownership makes a bigger difference at higher levels of income, perhaps by appealing to other needs on Maslow's (1943) pyramid. Finding the thresholds for the effects of wages and ownership on attitudinal variables should be of some significance, both theoretical and practical. For example, the study could be conducted in separate samples made up on each income decile within the worker population.

Finally, measures of high performance work systems and company culture and employee involvement in the different worksites or factories can be explored in order to see if they interact with wages or ownership such that "conditions of employment" play an important role in the findings.

CONCLUSION

Efficiency wage theory and employee ownership have been treated in separate literatures. This study attempts to bring together these two literatures, partly because of the overlap in their use of compensation to motivate employees, and partly because of differences of focus and methodology that can enrich both fields. As mentioned at the outset, employee ownership has not been considered as an efficiency wage in that eponymous economic theory, and this study should fill that gap. It is a gap worth filling because the findings herein may have an impact on issues of unemployment and workplace fairness, as well as firm performance through managerial decisions involving trade-offs between wages and ownership. Previous research has shown the efficiency effect of wages, and this study suggests that employee ownership may have an efficiency effect as well, either as a complement to sufficient wages or alone.

The main takeaway of this study that employee ownership is not a panacea—if wages are too low, they need to be raised before one can realistically observe the benefits of broad-based employee ownership. When wages are low, the story is simple: raise those wages to get efficiency effects. When wages are higher, such as above market, the story becomes more interesting as both wages and ownership impact various attitudinal variables in different ways, either singly or in together, to yields stronger efficiency effects.

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Tables

Table 1. Variables used

	Variable name	Description	Operationalization
Independent	ObjWage (earndiff)	Earnings relative to market (by job type, industry, and state)	earnings / predicted earnings (%)
	SubWage (fixedpct)	By what percent were your fixed annual wages higher or lower than those of employees with similar experience and job descriptions in other companies in your region?	(%)
	EOtoWages (eopay)	Total stock relative to wages	ratio
	EOtoMarket (eorelative)	Stock relative to market per year	ratio
Dependent	Loyalty (loyaltyr)	How much loyalty would you say you feel toward the company you work for as a whole?	(1=a lot, 2=some, 3=only a little, 4=no loyalty at all)
	WillToWork (willworkr)	I am willing to work harder than I have to in order to help the company I work for succeed.	(1=strongly agree, 5=strongly disagree)
	JobSeeking (lookhard)	How likely is it that you will decide to look hard for a job with another organization within the next twelve months?	(1=not at all likely, 2=somewhat likely, 3=very likely, 4=already looking)
	CompanyFairness (cofair)	Overall, this company is fair to its employees.	(1=strongly disagree, 7=strongly agree)
	GoodWages (grdwage)	Paying good wages.	(4=A, 3=B, 2=C, 1=D, 0=F)
	GoodBenefits (grdben)	Giving fair benefits to workers.	(4=A, 3=B, 2=C, 1=D, 0=F)
	SenseOfPurpose (grdpurp)	Creating a sense of common purpose in the company.	(4=A, 3=B, 2=C, 1=D, 0=F)
	TrustInCompany (grdtrust)	Trustworthiness in keeping its	(4=A, 3=B, 2=C, 1=D, 0=F)

		promises.	
	AccurateInformation	Accurate information about	(4=A, 3=B, 2=C, 1=D, 0=F)
	Gender (female)	Sex	company performance. 0=male, 1=female
	Overall relations (grdrel)	Age	Overall relations with employees. (4=A, 3=B, 2=C, 1=D, 0=F)
Control	AgeSquared (agesq)	Age*Age	years
	MaritalStatus (married)	Marital status	1=married, 2=living as married, 3=divorced,
	Divorced (divsepw)	Marital status=divorced, separated, widowed	1=yes, 0=no
	SomeCollege (smcol)	educ=some college, no degree	1=yes, 0=no
	AAdegree (aa)	educ=AA degree	1=yes, 0=no
	Bachelor (ba)	educ=Bachelor's degree	1=yes, 0=no
	Graduate (grad)	educ=graduate degree	1=yes, 0=no
	Hispanic (hisp)	Hispanic or Latino background	1=yes, 0=no
	Black (black)	Race is black	1=yes, 0=no
	Asian (asian)	Race is Asian	1=yes, 0=no
	Native (native)	Race is Native American	1=yes, 0=no
	Disabled (disab)	Do you have a health problem or impairment lasting 6 months or more that limits the kind or amount of work, housework, or other major activities you can do?	1=yes, 0=no
	Admin (admsupp)	administrative support staff (e.g., clerical, secretarial, record keeping)	1=yes, 0=no
	ProffesionalTech (proftec1)	professional/technical staff (e.g., scientist, engineering, finance, marketing)	1=yes, 0=no
	Sales (sales)	sales staff	1=yes, 0=no
	Service (custserv)	customer service staff	1=yes, 0=no
	LowMgt (lowmgt)	lower management (Supervisor)	1=yes, 0=no
	MidMgt (midmgt)	middle management (Manager/Director)	1=yes, 0=no
	UpMgt (upmgt)	upper management (Top Management)	1=yes, 0=no
	Hourly (hourly)	pay category=hourly	1=yes, 0=no
Supervisor (supervis)	As an official part of your job, do you supervise the work of other employees or tell other employees what to do?	1=yes, 0=no	
Tenure (tenure)	What was the date (month and year) that you first become employed at [this company]?	converted to years of tenure	
TenureSquared (tenuresq)	tenure * tenure	years	
Hours (hours)	About how many hours do you usually work at your job each week?	#	
Union (union)	union worker	1=yes, 0=no	
BonusPay (indpay)	Total cash yearly payments	\$ (0 if not eligible for performance pay)	

EmpInvolvement (ei)	Some companies have organized workplace decision-making in ways to get more employee input and involvement. Are you personally involved in any team, committee, or task force that addresses issues such as product quality, cost cutting, productivity, health and safety, or other workplace issues?	1=yes, 0=no
Training (train)	In the last 12 months have you received any formal training from your current employer, such as in classes or seminars sponsored by the employer?	1=yes, 0=no
JobSecurity (joblose)	Thinking about the next twelve months, how likely do you think it is that you will lose your job or be laid-off?	1=very likely, 2=fairly likely, 3=not too likely, 4=not at all likely

Table 2. Summary of Significant Relationships

dv	Reg 1		Reg 2		Reg 3		Reg 4	
	ObjWage	EtoMarket	ObjWage	EtoWages	SubWage	EtoMarket	SubWage	EtoWages
Overall								
Loyalty				0.04***	0.60***	0.38*	0.61***	0.06***
WillToWork	0.06**		0.05**		0.43***		0.44***	
JobSeeking	-0.05**		-0.06***		-0.69***		-0.70***	
CompanyFairness		1.00**		0.07**	1.67***	1.02**	1.66***	0.08***
GoodWages	0.27***		0.27***		2.16***	0.63***	2.21***	
GoodBenefits	0.09***		0.09***	0.03*	1.41***		1.39***	0.04**
SenseOfPurpose				0.04**	0.91***		0.91***	0.04**
TrustInCompany	0.05*		0.05*	0.05**	0.97***		0.96***	0.05***
AccurateInfo				0.05***	0.84***		0.86***	0.06***
GoodRelations	0.04*			0.05**	1.00***		0.99***	0.05**
Above market								
Loyalty				0.08***		0.69***		0.08***
WillToWork	0.07**		0.07**		0.41***		0.45***	0.06***
JobSeeking						-0.52**		
CompanyFairness		0.99*		0.10**		1.33**	0.31*	0.09***
GoodWages	0.15***		0.15***		0.23**	0.96***	0.36***	0.05**
GoodBenefits					0.43***	0.68**	0.36***	0.06**
SenseOfPurpose				0.06**	0.45***		0.48***	0.06**
TrustInCompany				0.05*				0.07***
AccurateInfo				0.06**	0.31***		0.32***	0.08***
GoodRelations	0.06*		0.06*	0.06**	0.41***		0.40***	0.06***
Below market								
Loyalty					0.60***		0.61***	0.04*
WillToWork					0.34***		0.28**	
JobSeeking					-0.69***		-0.71***	
CompanyFairness					1.23***		1.13***	
GoodWages	0.57***		0.59***		1.68***		1.64***	
GoodBenefits					0.92***		0.87***	
SenseOfPurpose					0.76***		0.69***	
TrustInCompany	-0.23*		-0.24**		0.82***		0.76***	
AccurateInfo					0.86***		0.80***	
GoodRelations					0.91***		0.85***	