Empirical Investigation of Autonomy and Motivation

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Abstract

I examine the hypothesis that employers give autonomy to workers who are already especially motivated. The empirical work is based on data from Wave 1 of the Health and Retirement Survey (HRS), a nationally representative longitudinal study of health, retirement, and aging. The HRS provides unique information on an individual's motives and autonomy on the job. I found empirical evidence that motivated workers are more likely than unmotivated to be in autonomous jobs, and that motivated workers receive higher wages in autonomous jobs. One implication of this result is that employers value motivated workers in autonomous jobs more highly than unmotivated workers in autonomous jobs, hence employers would be more willing to give autonomy to motivated people. The empirical findings, however, provide inconclusive evidence to determine the causality between autonomy and motivation.

Keywords: Intrinsic Motivation; Decentralization

JEL classification*:* M5, J2

1. Introduction

While the fact that autonomy inspires motivation has been widely recognized among studies on decentralization, surprisingly little attention has been given to delegating autonomy to especially motivated workers. In contrast, the literature on social psychology indicates that job performance reflects individual motives, drives, and emotions (Pyszczynski & Greenberg, 1987 and Baumeister & Newman, 1994). One might think then that employees differ in their degree of motivation, and that employers are more likely to give the more motivated worker a higher degree of autonomy. What factors motivate people is a question that has been present in psychology literature for a long time. Deci (1971) developed the idea that people might be driven by motives that reflect their needs and goals. Deci called the resulting motivation intrinsic, in contrast with what is known as externally or extrinsically driven (by rewards) behavior. Intrinsic motivation has also been introduced to management literature (see for example Galbraith, 1977 and Staw, 1989) as the motivation to perform a task, or to achieve specific outcomes. Galbraith and Staw argue that intrinsic motivation can be stimulated by developing a work environment where people can achieve their goals, and one way to do this is by providing autonomy. Autonomy, however, is a necessary, but not a sufficient, condition to induce better performance. Workers have to be interested in the task, i.e., they have to be already motivated to do the job.

If we accept that workers are either motivated or unmotivated, offering autonomous jobs to unmotivated workers will not necessarily stimulate them to be more motivated. Pyszczynski & Greenberg (1987) and Baumeister & Newman (1994) show that a motivated worker is driven by motivation to search, while an unmotivated worker is driven by motivation to ignore, i.e., motivated people have a lower cost of processing information than unmotivated ones. Motivated people show enthusiasm for acquiring information that is useful for the production process. A motivated worker will believe that a certain way of doing the job is the one that would bring the best results. He would therefore be discouraged if asked to follow other alternatives. In an organization where employees have no autonomy in decision making, a motivated worker would need stronger incentives to work than an unmotivated worker, who acquires no information about how best to get the job done. It follows that the employer may find it optimal to give autonomy to motivated workers, but not to the unmotivated ones.

There are few theoretical studies generating the prediction that autonomy is offered to already motivated workers. Aghion and Tirole (1997) investigate the two-way interaction between authority and information. Their model implies that delegation of decision rights is more likely when innovative activities are involved, where innovative activities are related to motivated workers. Later on, Murdock (2002) applies the idea developed by Staw (1989) that people are motivated by the outcomes, or intrinsic returns, of their work.

A motivated worker would participate in a project with high intrinsic returns, even when it brings financial loss. The employer can still gain from accepting such a project, given that the total surplus from all projects is positive. I present in this paper an empirical study of the effect of workers' motivation on the firm's choice of how much autonomy employees should be given. Using a sample from the Health and Retirement Survey, I test whether employers give autonomy to workers who are already especially motivated. The introduction of motivation to the discussion suggests some empirical predictions. If motivated people place a lower cost on processing information, then autonomy is less costly for motivated people than for unmotivated ones. Therefore, holding other things constant, motivated people will prefer autonomous jobs. Furthermore, employers would value motivated people in autonomous jobs more highly than unmotivated people in autonomous jobs. I found empirical evidence indicating that motivated workers are more likely than unmotivated workers to be in autonomous jobs. I also found that employers are willing to pay higher wages to motivated people in autonomous jobs. This result suggests that employers value motivated workers in autonomous jobs more highly than unmotivated workers in autonomous jobs, hence employers would be more willing to give autonomy to motivated people. The empirical findings, however, are inconclusive both in determining the causality between autonomy and motivation and in confirming the idea that motivation triggers autonomy.

2. Data

For this study, I use data from Wave 1 of the Health and Retirement Survey (HRS), a nationally representative longitudinal study of health, retirement, and aging. The HRS Wave 1 data collection was completed in 1992. It covers 12,521 men and women, born between 1931 and 1941. I have constructed a sample including 6,375 people. Those without jobs and the self-employed are excluded from the sample. People with a wage rate below a $1 per hour and those paid more than $150 per hour are excluded as well. The HRS provides unique information on autonomy and motives. Respondents were asked whether they strongly agreed, agreed, disagreed, or strongly disagreed with the following statement: "Even if I didn't need the money, I would probably keep on working." I use the answers to this question as indicators of motivation. Respondents are classified as motivated if they strongly agreed or agreed with the question addressing motivation. The second group, classified as unmotivated, includes people who disagreed or strongly disagreed with the statement. Table 1 presents the sample distribution of responses. More than 50 percent of the sample agreed that they would work even if they did not need the money, while only 12 percent strongly agreed. This result holds for both males and females, with the more impressive 55 percent for females. Approximately a quarter of the sample disagreed, for both males and females; and less than 10 percent strongly rejected the possibility of working when they would not need the money.

Insert Table 1 about here

The data also provides a self-reported attitude variable for autonomy. Respondents were asked: "Thinking of your job, please tell how often this statement is true: I have a lot of freedom to decide how I do my own work". Respondents answer the autonomy question with: all or almost all of the time, most of the time, some of the time, none or almost none of the time. Thirty percent of the sample reported having freedom all or almost all of the time. These people form the autonomous group. Table 2 reports the sample descriptive statistics by motivation.

Insert Table 2 about here.

The most important differences between the motivated and the unmotivated group are in terms of autonomy and union status. Among those that are motivated, 35 percent hold autonomous jobs, while this number is only 26 percent for the group of the unmotivated people. Further, only 23 percent among the motivated are union members, vs. 33 percent among the unmotivated. One possible interpretation would be that motivated people do not need the security provided by a union membership. If this is true, it might be reflected in the wage earned.

3. Empirical Model and Estimation

Jobs have two dimensions: wage rate,W, and a non-wage attribute, autonomy, A. Thus, the wage offered by the employer and available to a worker with human capital X and motivation M is: $Wo = X\beta + \alpha_1 M + \alpha_2 MA + \alpha_3 A + \varepsilon$. X includes variables such as age, education, and labor market experience, which can be observed, together with some unobservable variables, such as intelligence, ability to work in a group, etc. It is plausible that a job with autonomy might turn out to be more costly to the firm as employers would incur both loss of information and control. If all workers prefer autonomy, firms might have to offer higher wages for less autonomous jobs. Let α_3 denote the compensating wage differential associated with autonomy. This is the forgone wage for accepting a job with a higher level of discretion.

Let α_2 be the wage differential for a motivated person. Among workers, there is heterogeneity in the monetary value, V^*, of working in an autonomous job: $V^* = Z\Gamma + \gamma M + v$, where Z is a vector of characteristics that may also affect preferences for autonomy. The value of autonomy, V^*, does not depend on the wage, but rather is the value that every worker places on autonomy, regardless of the wage offered to him. This value depends on the worker's motivation. The cost of taking an autonomous job for a person with given human capital X and motivation M is $\alpha_2 M + \alpha_3$. Therefore, people choose autonomous jobs when their value is higher than the cost they would incur:

$\Pr(A = 1|M) = \Pr(Z\Gamma + \gamma M + v > \alpha_2 M + \alpha_3) = \Pr(v > (\alpha_2 - \gamma)M - Z\Gamma + \alpha_3)$, where $\Pr(A = 1|M)$ is the probability of being in an autonomous job given motivation. The model is:

$$W = X\beta + \alpha_1 M + (\alpha_2 M + \alpha_3)A + \varepsilon \quad (1)$$
$$V^* = Z\Gamma + \gamma M + v \quad (2)$$
$$A = 1 \; if \; V^* > \alpha_2 M + \alpha_3 \quad (3)$$
$$A = 0 \; otherwise \quad (4)$$

I allow ε and v to be correlated. The error terms (ε,v) are jointly, normally distributed. I use Heckman (1979) to estimate the system. If (ε,v) are independent, the estimation amounts to applying OLS to equation (1) and a Probit Maximum Likelihood method to equation (2). The wage equation includes gender, race, and years of education, experience, union status, hours worked (per year), industry dummies, occupation category, and regional location. The same variables are included in the autonomy probit model, except for the variables for experience, hours worked, and regional location, which are the identifying exclusionary restrictions. (See Osterman, 1994).

The probit model has, as covariates, motivation and a set of variables Z that may affect preferences for autonomy. Those variables are: ladder1, ladder2, security, flexible time, and establishment size. The ladder1 and ladder2 variables capture "property rights in jobs." The HRS provides two measures of seniority-based job ladders: first, whether the employer gives younger people preference over older people in decisions about promotion, and second, whether older workers feel the pressure to retire before age 65. The security variable addresses the issue of workers' certainty about keeping their jobs for the year that follows. On a scale from 0 (absolutely no certainty) to 10 (absolutely certainty) they were asked how likely it is that they would lose their jobs during the following year. 'Flexible time' is a dichotomous variable, which takes the value of one if employees work on a flexible schedule.

3. Results

The coefficients in the probit model are reported in Table 3 in Appendix. Motivated people value autonomous jobs more than unmotivated people. Males are more likely to prefer autonomy than females. Race and education do not have a significant impact. The coefficients on the Z variables show that individuals who work in a place where the employer prefers younger over older people in decisions about promotions, or where older workers feel pressure to retire before age 65, hold a lower value of autonomy on the job. It seems that, when workers are concerned about keeping their jobs, whether or not there is autonomy on the job is not that important. The same holds for people who are certain that they won't be able to keep their jobs for the year that follows. Further, people who have the opportunity to work on flexible time schedules place higher value on autonomous jobs. Finally, union members place a lower value on autonomy on the job. However, jobs that tend to be unionized usually provide a lower level of autonomy. Thus, one cannot conclude that workers prefer union membership to autonomy on the job.

Insert Table 3 about here.

The two error terms, ε and v, turn out to be independent and the estimation procedure is simplified to a simple OLS applied to the wage equation and a Probit to the autonomy equation. The results from the OLS estimation are presented in Table 4. The human capital variables have standard signs. After controlling for both autonomy and motivation, motivated people in autonomous jobs have higher wages. Therefore, the employer is willing to pay a premium, $\alpha_2 > 0$, to a motivated person in an autonomous job. From the probit equation I have found that motivated people are more likely to be in autonomous jobs, or $(\alpha_2 - \gamma) > 0$. This result, together with the positively signed α_2, means that the premium that the employer pays is greater than the reduction in pay that the worker is willing to accept. It is impossible, however, to find the sign of γ.[1]

[1] Probit model parameters are estimated only up to a scale.

The monetary value of autonomy to a motivated person, γ, holding the wage constant, could be positive or negative.

Insert Table about 4 here.

4. Conclusions

The interplay of autonomy and motivation affects the output and division of labor. Autonomy, however, is a necessary but not a sufficient condition on improved performance. Thus, offering autonomous jobs to unmotivated workers will not necessarily stimulate them to be more motivated. Further, motivated people have a lower cost of processing information than unmotivated ones. Using data from Wave 1 of the HRS that provides unique information on autonomy and individual motives and applying a continuous latent variable model where both the latent variable and its realized qualitative variable are included in the model, I found empirical evidence that motivated workers are more likely to be in autonomous jobs, and that they receive higher wages in autonomous jobs. This implies that employers value motivated workers in autonomous jobs more highly than unmotivated workers in autonomous jobs. Thus employers would be more willing to give autonomy to motivated people.

When there is autonomy on the job, the effect of motivation on the wage washes out, while with no autonomy on the job, motivated people receive lower wages. Although this result seems to be contradictory at first glance, it reflects some of the properties of the sample under study, mainly, the age profile of the sample. It might reflect, for example, the fact that respondents who answer the question of whether they would work if they did not need the money might not necessarily have in mind their motivation to work. Instead, they may still work, as opposed to staying at home, to keep their social contacts. It might also be that, they want to feel useful, belong to an organization, or they may have other reasons that have little or nothing to do with their internal motivation to work. For these same reasons, people would work even if they might be paid less, or if there is no autonomy on the job. These effects, unfortunately, cannot be separated. In general, the empirical results support the basic idea of the paper that motivation triggers autonomy and that employers give autonomy to workers who are already especially motivated.

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Table 1. Even if I didn't need the money, I would probably keep on working

	Male		*Female*		*All*	
	number	proportion	number	proportion	number	proportion
strongly agree	372	0.12	403	0.12	775	0.12
Agree	1, 568	0.52	1, 848	0.55	3, 416	0.54
Disagree	781	0.26	832	0.25	1, 613	0.25
strongly disagree	298	0.10	273	0.08	571	0.09
Total	**3, 019**	**0.47**	**3, 356**	**0.53**	**6, 375**	**100**

Source:HRS Wave 1 (1992).

Table 2 - Sample descriptive statistics by motivation

	Motivated		*Umotivated*		*All*	
	mean	st.dev.	mean	st.dev.	mean	st.dev.
Autonomy*	0.35	0.48	0.26	0.44	0.32	0.47
Male	0.46	0.50	0.49	0.50	0.47	0.50
White	0.75	0.43	0.72	0.45	0.74	0.44
Years of educ.	13	3	12	3	13	3
Experience	36	6	37	6	36	6
Union*	0.23	0.42	0.33	0.47	0.26	0.44
Hourly wage	12.43	8.02	12.69	7.48	12.52	7.84
Hours per year	2015	620	2035	539	2022	593
N:	4191		2184		6375	

Source:HRS Wave 1 (1992).
* Differences are significant at the 5% level.

Table 3 Probit Model of Autonomy

	(1)	*(2)*	*(3)*	*(4)*
Motivation	0.057**	0.059**	0.059**	0.059**
	(0.012)	(0.012)	(0.012)	(0.012)
Male	0.072**	0.076**	0.076**	0.060**
	(0.013)	(0.013)	(0.013)	(0.012)
White	0.020	0.028*	0.028*	0.022
	(0.014)	(0.014)	(0.014)	(0.014)
Years of Education	0.012**	0.013**	0.013**	0.014**
	(0.002)	(0.002)	(0.002)	(0.002)
Experience	0.003**	0.003**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Ladder1	-0.051**	-0.052**	-0.052**	-0.052**
	(0.018)	(0.017)	(0.017)	(0.017)
Ladder2	-0.076**	-0.075**	-0.075**	-0.082**
	(0.018)	(0.018)	(0.018)	(0.018)
Security	-0.016**	-0.016**	-0.016**	-0.016**
	(0.002)	(0.002)	(0.002)	(0.002)
Flex time	0.085**	0.085**	0.085**	0.089**
	(0.015)	(0.015)	(0.015)	(0.015)
Union Membership	-0.084**	-0.085**	-0.085**	-0.098**
	(0.014)	(0.014)	(0.014)	(0.014)
Industry Dummies	Yes	Yes	Yes	No
Occup. Dummies	Yes	Yes	No	No
Size Dummies	Yes	No	No	No
Observations	6374	6374	6374	6374
Log likelihood	-4008.273	-4008.273	-4008.273	-4008.273

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 4 Wage Equation

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Motivation	-0.062**	-0.059**	-0.061**	-0.061**	-0.059**
	(0.020)	(0.021)	(0.021)	(0.021)	(0.021)
Autonomy*Motivation	0.062*	0.057*	0.058*	0.058*	0.045
	(0.026)	(0.026)	(0.026)	(0.026)	(0.027)
Autonomy	0.048*	0.051*	0.048*	0.048*	0.046*
	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)
Male	0.250**	0.250**	0.247**	0.247**	0.271**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.014)
White	0.051**	0.056**	0.050**	0.050**	0.059**
	(0.015)	(0.015)	(0.014)	(0.014)	(0.015)
H. worked (per year)	0.000**	0.000**	0.000**	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Years of Education	0.078**	0.079**	0.080**	0.080**	0.084**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Experience	0.022**	0.022**	0.022**	0.022**	0.025**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Experience squared	-0.000**	-0.000**	-0.000**	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Union Membership	0.128**	0.155**	0.155**	0.155**	0.192**
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)
Industry Dummies	Yes	Yes	Yes	Yes	No
Occup. Dummies	Yes	Yes	Yes	No	No
Size Dummies	Yes	Yes	No	No	No
Region Dummies	Yes	No	No	No	No
Observations	6277	6277	6277	6277	6277
R-squared	0.42	0.41	0.41	0.41	0.38

Robust standard errors in parentheses
* Significant at 5%; ** significant at 1%
Dependent variable is log-hourly wage.