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**DIVERSITY, SOCIAL GOODS PROVISION,
AND PERFORMANCE IN THE FIRM**

Sara Ellison
Jeffrey Greenbaum



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Abstract

The last decade has seen a growing interest among economists on the effect of diversity on the provision of social goods and the stock of social capital. Indeed, in

1 Introduction

As the American workforce has grown increasingly diverse, business and academic leaders have questioned whether and how diversity contributes to some quantifiable “bottom line.” Much of this increased diversity has arisen out of broader social changes, and the consequent social benefits, though difficult to quantify, may be quite important. With these social changes as a backdrop, the focus of this paper is smaller but sharper. Given these larger social changes, it is still valuable to focus attention on diversity in a market environment, that created by a firm and its workforce. Regardless of the cause of the increased workplace diversity, it is the job of the managers to encourage the greatest productivity possible from their units, maximizing profits, perhaps, or some other quantifiable outcome. It is our goal, then, to shed light on how diversity (or an environment supportive of diversity) is associated with those outcomes.

The last decade has seen a growing interest among economists on the effect of diversity on the provision of social goods and the stock of social capital. Numerous studies have found evidence that social goods are provided at a lower level in communities or groups exhibiting fragmentation on various dimensions. For example, Vigdor (2001) finds that census response rates are lower in census tracts with higher ethnic fragmentation. Costa and Kahn (2003) find that desertion rates are higher in Civil War military companies with higher age and occupational fragmentation. Glaeser, Laibson, Scheinkman, and Soutter (2000) find that trust is lower among Harvard undergraduates when race and nationality fragmentation is higher. Several studies have documented that school funding is higher in more homogenous communities (see, e.g., Goldin and Katz (1999), Poterba (1997), Miguel and Gugerty (2002)). (See also Costa and Kahn (2003) for an excellent survey of this literature.) These results are intriguing and potentially quite important in contexts where social goods provision is either the output of interest or is an important factor in the output of interest. However, in some contexts, the social good may be an “intermediate good.” In the

case of higher school funding in more homogeneous communities, for example, we may ultimately be interested in the effect that this homogeneity has on school quality (both conditional and unconditional on its effect on school funding). Indeed, in the workplace, cooperation, trust, and other social goods may be important elements of the smooth functioning of an office. But firm owners and central managers ultimately care about an office's performance, as reflected in revenues, costs, and profits.

This paper explores this next logical question: how does diversity affect ultimate performance? A baseball team composed entirely of catchers might have a high provision of social goods—they give each other tips on catching the knuckler, they borrow each other mitts, they go out for beers—but ultimately they will surpass even the '62 Mets in futility on the field. An economics department composed entirely of junior econometricians might also have tremendous esprit de corps, but would, we presume, have trouble attracting the best graduate students. Indeed, a military company with low age and occupational fragmentation might enjoy a low level of desertion but might not have the diversity of skills necessary to be successful in battle.

We have a unique data set from a firm which operates numerous small offices in the United States and abroad. They have provided us with eight years of individual-level employee survey data as well as office-level measures of diversity and performance over that period. The survey data furnish us with several indicators of firm social capital or corporate culture, such the level of cooperation among people in an office, and the levels of employee satisfaction and morale. The data allow us to address two distinct questions. First, broadly speaking, do we find lower levels of social goods provision, such as the extent of cooperation, in more diverse offices? The lower level of social goods provision was a robust finding in the studies cited above, but our results provide an interesting complement to those, both because economists have previously focused on the effects of diversity in communities instead of workplaces,¹ and because we are

¹Costa and Kahn's study of Union Army troops is a possible exception.

able to measure diversity on two dimensions heretofore unexplored in this literature, gender and tenure. We do, indeed, find that higher office-level gender diversity is associated with lower employee cooperation (and morale and satisfaction), but that tenure diversity has little or no effect.

In addition to our direct measures of office-level diversity, we also have employee responses to a question about whether the firm is accepting of diversity. We construct an office average of this response. Interestingly, we find that offices where the employees think the firm is accepting of diversity tend to be *more* cooperative, and have higher morale and satisfaction. These two sets of results, seemingly at odds, might be interpreted in the following way: employees like the idea of a diverse workplace—and may therefore provide social goods more readily in a setting that they think is supportive of diversity—but are actually more comfortable in a homogeneous setting.

While we think these results are provocative and contribute to the literature in a number of ways, we want to focus also on a second important question: What is the effect of office diversity on performance? One can imagine a situation where diversity leads to low cooperation (and perhaps low satisfaction) in a workplace but also to that workplace having a diversified portfolio of skills to draw upon. We would presume the first effect would hinder performance of most types—we measure performance with office-level revenue—while the second would enhance it. Which effect dominates then becomes an empirical question, and one that we can, in principle, answer with

In other words, our results suggest that, consistent with the previous economics literature, employees are more cooperative in more homogenous settings. These more homogenous units, however, seem to be less productive overall, perhaps because they have a less varied portfolio of talents on which to call.

2 Social Capital in our Setting

The introduction cited a number of studies documenting the relationship between diversity (of various types) and the provision of social good or the accumulation of social capital. It is useful at this juncture to define what we mean by social capital, offer examples in a workplace setting, and relate those examples to other literature as well as ways of measuring the stock of social capital.

For our purposes we follow Putnam's (1995) definition: "By analogy with notions of physical and human capital—tools and training that enhance individual productivity—'social capital' refers to features of social organizations such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit." Much of the important work in social capital has been performed by sociologists. In particular, distinctions between different types of social capital have been emphasized. Putnam (2000, 1995) has noted the difference between "bridging capital" and "bonding capital." The former brings together or bridges what otherwise would be separate social groups and networks. So a workplace with high levels of diversity might bridge otherwise separate worlds. On the other hand, "bonding capital" refers to relatively close ties that can foster cooperation in high stakes exchanges. Granovetter (1973) made the seminal distinction of weak ties and strong ties, which has also been applied in economic environments. Most notably Granovetter (1974) examined the role of social networks in getting a job.

Empirical studies of the factors which affect the stock of social capital, such as

as in the theory of the firm, many possible “transactions” between employees can benefit the owners of the firm, but it may be too difficult to monitor and reward these transactions through an explicit contract. Rather, they are best accomplished by employees exchanging long term favors.

3 Theory

In discussing these ideas, we find it useful to refer to a theoretical model to provide some structure as well as insight into the mechanisms at play. Rob and Zemsky (2002) (hereafter RZ) provide such a framework. Their model shows how employees in a firm can be given incentives to contribute to social capital as well as the dynamics of how a stock of social capital can persist or deteriorate over time. While they do not explicitly discuss diversity, their model can be interpreted and modified to incorporate various channels through which diversity can operate. It is helpful to sketch the set-up of their model and discuss it in our empirical framework.

They start with a continuum of employees on the unit interval, each indexed by an idiosyncratic tendency to feel guilty, $\theta_j \in U[0, 1]$. Each must choose two effort levels, individual effort e_I and cooperative effort e_C . We think of the cooperative effort as contributing to the firm’s social capital. The firm cannot observe the split between these two types of effort but can measure output, which is a function of both. In particular, observed output of individual j is $\hat{Q}_j = ae_I(j) + \frac{1}{2} \min(e_C(j), 1) + \frac{1}{2} \int_0^1 \min(e_C(i), 1) di$, with a a constant where $\frac{1}{2} < a < 1$. Note that an individual’s cooperative effort contributes strictly less to his measured output than his individual effort. Note also that a contribution to an employee’s output comes through the cooperative effort all of his coworkers have supplied. Here, we have normalized to 1 the amount of cooperation that is optimal from the firm’s perspective; therefore, any additional cooperative effort above 1 will not contribute to output.

Driving an employee’s decision how to divide his effort is his utility function, $U_j = W_j$

governing how costly it is to him to supply effort (of either type), and r is a parameter describing firm-level reciprocity. We can think of the third term as representing guilt that the employee feels from not contributing the optimal amount of cooperative effort. $(1 - e_C(j))$ is the amount of shirking that he has to be guilty about and $(r\bar{e}_C + \gamma_j)$ is the strength of his guilt. Note that the strength of guilt is a function of office-level reciprocity, average cooperative effort, and employee j 's idiosyncratic guilt tendency.

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Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
At the employee level:					
<i>Satisfaction</i>	1707	3.943	0.990	1	5
<i>DPerception</i>	1709	4.702	0.695	1	5
<i>Morale</i>	1683	3.592	1.017	1	5
<i>Cooperate</i>	1541	4.038	1.036	1	5
<i>Male</i>	1648	0.329	0.470	0	1
<i>TenureYears</i>	1665	2.570	2.087	0.25	7
At the office-year level:					
<i>Unemploy</i>	272	4.77	1.83	1.4	12.2

variable for male for each office and scaled it linearly to fall into $[0, 1]$, where 0 indicates an all-male or all-female office and 1 is an office evenly divided. This variable is called *GendDiversity*. In our data, the minimum value is 0 and the maximum is 1. Note that this firm employs more women than men, and that we have both male-dominated and female-dominated offices among our observations where *GendDiversity* is near 0.

Also, the surveys ask how diversity is accepted at the firm:

The company provides a working environment that is accepting of ethnic, lifestyle and gender differences.

- (A) agree
- (B) tend to agree
- (C) ?
- (D) tend to disagree
- (E) disagree

We can, therefore, construct a measure of how accepting the employees think the firm is of diversity at the office-year level. We average responses to that question over all observations for a particular office-year to create *AvgDPerception*. (An individual employee's response is contained in *DPerception*.) It is possible that this measure is a proxy for diversity on dimensions on which we do not have data, such as lifestyle and ethnicity. Alternatively, one could interpret *AvgDPerception* as literally that—a perception of how diversity is accepted at a particular office which could be at odds with actual diversity.

We can also construct (and)-321(fer(ely)81(,40(eptce-y)2ekt21(ise-y)e-[(W2s42(c)4g381(Alteeters)

Satisfaction, Cooperate, and Morale

and *Satisfaction* might also capture elements of social goods provision since they are based on the employees' perception of how high morale is in the office and how satisfied they are with the office. *Satisfaction*, *Morale* and *Cooperate* are coded so that higher reported satisfaction have higher numerical values, with a maximum of 5 for (A) answers and a minimum of 1 for (E) answers. Any (F) answers were dropped.

From the survey responses, these variables are positively but not perfectly correlated. (The pairwise correlations between *Satisfaction* and *Morale* is .61, between *Satisfaction* and *Cooperate* is 0.36, and between *Morale* and *Cooperate* is .53.) So the survey answers capture a more nuanced situation than employees being uniformly "happy" or "unhappy" with their work, and that attitude pervading all responses.⁶

Table 1 also contains summary statistics on a measure of office performance, *Revenues*. These come from internal data that the firm provided to us on their annual revenues at the level of each office.

Finally, we augmented all of this information with a number of economic and demographic variables for each of the cities in which an office is located. We collected annual data on unemployment rate by city from the Bureau of Labor Statistics (or comparable foreign agencies for the foreign cities), and it can be found in the variable *Unemploy*. Summary statistics on this variable are included in Table 1. The other economic and demographic measures, based primarily on census data, do not vary over the course of our time period. Those are reported in Table 2.⁷ These variables are largely self-explanatory, but a few comments are warranted. *CPolitics*, an index of city political leaning, was constructed based on voting for the 2004 Presidential election (and so only exists for US cities). Orange County had the maximum index value in our data set of 227. Detroit had the minimum at 1. Also note that for

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of particular interest, such as *GendDiversity*, *TenureDiversity*, and *AvgDPerception*, as well as additional control variables. Controls at the employee level include the employee's job tenure, *TenureYears*, and a dummy variable for the gender of the respondent, *Male*. Other controls are year of the response, *Year*, the fraction of males in an office,

we have, on average, four years of data¹⁰ for each office, a length of time when most offices would not have experienced significant turnover, so we would expect that much of our identification of the diversity effects would come out of the cross-section. In order both to control for some city (office) characteristics and to preserve some identification out of the cross-section, we include specification (2). Although none of the city-level characteristics we include are significant in this regression, the other results are affected. In particular, the coefficient on *GendDiversity* is cut in half and is no longer even marginally significant. Note, though, that we lose a relatively large fraction of our observations when we include the extra covariates due to missing observations.

Finally, we include a fixed effects model, specification (3). The results are consistent with our concern about being able to identify effects out of time series variation alone. In particular, *GendDiversity* is not significant. Notably, though, the coefficient on *AvgDPerception* increases somewhat and becomes more significant with the inclusion of the office fixed effects. This finding is less surprising given that *AvgDPerception* could be driven in part by firm-wide policy changes over time and, therefore, have its effect identified more by the time series.

Recall that while *Cooperate* was our preferred measure of social goods provision, we have alternative measures, *Satisfaction* and *Morale*. Of the two, *Satisfaction* seems less well-suited as a proxy for social goods provision because the sources of employee satisfaction, though unlikely, could be entirely individual in nature. *Morale*, however, has a more cooperative, or group-based, connotation. The results for *Satisfaction* and *Morale*, found in Table 4, are similar in nature to those for *Cooperate*, but stronger statistically. Higher levels of *AvgDPerception* are associated with large, statistically significantly higher levels of *Satisfaction* and *Morale*. But higher levels of actual gen-

¹⁰ We have data for the maximum eight years for about a quarter of our offices. For the other offices, we have data for one or two years during the eight year period and for others data are missing for a year or two in the middle of the period.

der diversity, *GendDiversity*, are associated with lower indicators of well-being, and this association seems more persistent and significant than in the first set of regressions. The coefficient on *GendDiversity* is marginally significant in specifications (1) and (2) and solidly so in specifications (4) and (5). *TenureYears*, insignificant in specification (1), is negative and significant in the *Morale* regressions, and marginally so in the *Satisfaction* regressions. The estimated magnitudes for both of those effects are small, however. The control for *Year* also becomes significant in all six specifications. The same broad patterns in the results emerge, though. Recall that these indicators of employee satisfaction, or proxies for workplace social capital, are not perfectly correlated so the estimated relationships reflect three similar but distinct patterns.

We take the following broad lessons from the results at this stage: actual diversity is associated with lower levels of social capital (at least marginally), whereas the perception at the office level that the firm supports diversity is associated with higher levels of social capital. This latter result is present even after controlling for a fixed geographic effect. We find it interesting that most other explanatory variables were not particularly close to being significant—we would not have been surprised to find significantly different answers to these survey questions between men and women respondents, for instance, or in male-dominated versus female-dominated offices. Those differences were largely absent, though.

We find these results interesting and certainly suggestive of patterns where diversity can have important effects in the workplace. We offer them, however, with a caveat. One might be concerned about the potentially endogenous placement of employees in offices. In particular, a firm might hire employees to achieve a certain gender mix, for instance, and could possibly focus that hiring in offices with lower morale or cooperation. Although we cannot dismiss a concern such as this out of hand, we would argue that this concern is not likely to be so important in our particular setting. The firm we study was quite young at the time and experiencing rapid growth. While now it is a much more well-established and mature firm, in the late

1990's, it was run by a set of college friends who largely hired additional friends of theirs to start up offices in cities where they were interested in moving. The firm was run on a shoestring, and expenditures like corporate consultants to advise the firm on corporate culture and diversity in hiring would not have been in the budget. Hiring was not random, of course, but elements of the hiring process which could lead to troublesome endogeneity for us were likely to have been absent. In addition, the fact that we see all-male, all-female, and mixed offices in the data also suggests that the firm was not interested in targeting a certain gender mix.

5.2 Performance

While we care about these indicators of employee satisfaction as proxies for social capital or corporate culture, they remain intermediate inputs. A firm's ultimate aim is to generate revenues and profits. So in Table 5, we look at the association between office-level attributes and the log of office-level *Revenues*. Of course in interpreting these and other results, we are careful about inferring causality where correlation is established. Nonetheless, we think it is valuable to document empirical correlations that might be a subject of speculation in the academic literature and popular discussion.

A comment about our dependent variable is warranted. Basic economic models of firm behavior hold that firms maximize profits, not revenues, which suggests that our primary focus should be on the effects of diversity on firm profit. Not surprisingly, we do not have measures of office-level profit, only revenues, nor do we have any wage data. We were able to obtain data on office rental rates, which we include as a covariate in one of our specifications below (although we do not have information on the relative sizes of this firm's offices). To the extent that firms use revenues as a rough proxy for profits, though, our results will still be meaningful.

With that caveat in mind, we turn to Table 5. First note that we have added additional explanatory variables as controls, such as office-average tenure, *AvgTYears*.

We also include *Unemploy*, which is the unemployment rate in the office's closest

of skills that is essential to ultimate performance.

Of course we are interested in controlling for any source of spurious correlation. For example, a hypothetical San Francisco office would operate in a more diverse

Note that we did not include a specification with number of employees as an explanatory variable. Number of employees could proxy for one component of firm cost, of course, but absent wage data, it would likely be a poor proxy. Furthermore, we felt that the strength of the relationship between office revenues and office employees would mostly be arising from the mechanical need to hire additional employees as office revenues increased. Therefore, these results should be viewed as a reduced-form estimate of patterns in the data as opposed to any causal relationship.

Recall that in our discussion of the RZ model, we noted two additional implications. The fact that multiple steady states of the model can occur with high r implies 1) the possibility of a bimodal distribution of output in high r offices (or at least higher dispersion)¹¹ and 2) more output persistence in high r offices. To investigate these possibilities, we took the residuals from our base model (1) of $\text{Log}(\text{Revenues})$ from Table 5. If there was, in fact, a bimodal distribution of output for high r offices, we would expect to see a bimodal distribution of residuals from that regression for those offices. A kernel regression of the residuals from offices with $\text{GendDiversity} = 0.5$, which we interpret as high r offices, did not reveal any obvious bimodality. (Residuals from high r offices did, however, exhibit higher variance, 1.37 versus 1.00.) Second, we regressed the residuals on lagged residuals by office as well as an interaction between lagged residuals and GendDiversity . Greater output persistence for high r offices should be manifested in a negative and significant coefficient estimate on the interaction term. Strangely, however, the estimated coefficient was significant but positive. We do not have a particular interpretation for this finding.

¹¹ A sufficient condition for high r offices would not result in a bimodal distribution of output. If the sufficient condition is not satisfied, then the variance of any error in the system that result would simply be higher dispersion but not bimodality.

6 Conclusion

The managers of firms, like baseball teams, face the challenge of assembling a workforce and a culture that will succeed in the task at hand.

The results of this paper shed light on how actual and perceived diversity is associated with indicators of firm social capital and measures of ultimate office performance, revenues.

We find that the perception that a firm is supportive of diversity in an office is strongly associated with indications of the level of cooperation in that office. Other proxies for social capital or corporate culture, such as employee morale and satisfaction, were also strongly higher in offices in which this perception was higher. Nevertheless, the presence of actual gender diversity was a significant factor in *reducing* these same measures of social capital.

Table 3: Results of employee-level regressions

Explanatory variables	Dep. variable: <i>Cooperate</i>		
	(1)	(2)	(3)
<i>GendDiversity</i>	-0.168 (-1.74)	-0.086 (-0.67)	0.048 (0.36)
<i>TenureDiversity</i>	0.682 (1.39)	0.022 (0.04)	-0.542 (-1.07)
<i>AvgDPerception</i>	0.524 (4.03)	0.535 (3.52)	0.608 (6.36)
<i>TenureYears</i>	-0.016 (-1.24)	0.003 (0.16)	0.007 (0.52)
<i>Year</i>	-0.004 (-0.21)	-0.015 (-0.75)	-0.029 (-1.78)
<i>Male</i>	0.002 (0.02)	0.093 (1.32)	0.014 (0.22)
<i>AvgGender</i>	-0.050 (-0.33)	-0.172 (-0.87)	-0.336 (-1.40)
<i>log CPopulation</i>		-0.046 (-1.13)	
<i>CPercMale</i>		-0.029 (-0.72)	
<i>CPercMinority</i>		-0.003 (-0.70)	
<i>CAvgAge</i>		-0.008 (-0.32)	
<i>CO ceRent</i>		0.001 (0.92)	
<i>Constant</i>	1.738 (2.70)	3.855 (1.70)	1.450 (3.06)
Observations	1440	1122	1440
Office fixed effects?	No	No	Yes

Notes: Robust t statistics in parentheses. Coefficients in bold are significant at the 5% level.

Table 4: Additional results of employee-level regressions

Explanatory variables	Dependent variable:					
	<i>Satisfaction</i>			<i>Morale</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>GendDiversity</i>	-0.154 (-1.83)	-0.128 (-1.80)	0.020 (0.17)	-0.351 (-3.59)	-0.226 (-2.24)	-0.089 (-0.77)
<i>TenureDiversity</i>	0.248 (0.74)	0.198 (0.46)	-0.383 (-0.92)	0.836 (1.94)	0.430 (0.89)	0.417 (0.98)
<i>AvgDPerception</i>	0.621 (7.90)	0.684 (8.89)	0.672 (7.98)	0.634 (5.16)	0.691 (5.05)	0.795 (9.33)
<i>Tenure Years</i>	-0.035 (-1.87)	-0.049 (-2.84)	-0.019 (-1.53)	-0.063 (-5.66)	-0.054 (-3.02)	-0.042 (-3.33)
<i>Year</i>	-0.072 (-5.36)	-0.064 (-4.62)	-0.082 (-6.34)	-0.066 (-3.66)	-0.058 (-3.28)	-0.082 (-6.25)
<i>Male</i>	0.021 (0.41)	-0.039 (-0.72)	0.029 (0.52)	-0.043 (-0.74)	-0.048 (-0.62)	-0.035 (-0.63)
<i>AvgGender</i>	-0.102 (-0.42)	0.077 (0.70)	-0.359 (-1.77)	0.215 (1.05)	0.226 (1.39)	-0.028 (-0.14)
<i>log CPopulation</i>		0.025 (0.68)			-0.038 (-0.71)	
<i>CPercMale</i>		-0.004 (-0.13)			-0.020 (-0.65)	
<i>CPercMinority</i>		-0.002 (-0.86)			0.000 (-0.12)	
<i>CAvgAge</i>		-0.002 (-0.12)			-0.002 (-0.08)	
<i>CO ceRent</i>		0.001 (1.16)			0.004 (2.89)	
<i>Constant</i>	1.635 (4.39)	1.491 (0.78)	1.411 (3.38)	1.270 (2.09)	2.098 (1.12)	0.474 (1.12)
Observations	1579	1233	1579	1558	1216	1558
One fixed effects?	No	No	Yes	No	No	Yes

Notes: Robust t statistics in parentheses. Coefficients in bold are significant at the 5% level.

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