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Diversity, Social Goods Provision, and Performance in the Firm

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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 the workplace, cooperation, trust, and other social goods may be important elements of the smooth functioning of an office, but firm owners ultimately care about an office's performance, as reflected in revenues, costs, and profits. We explore this next logical question: how does diversity affect ultimate performance? 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, which measure quantities such as level of cooperation, as well as office-level measures of diversity and performance over that period. We find some evidence that more homogeneous offices enjoy higher levels of social goods provision but that those offices do not perform any better and may actually perform worse. We speculate that one possible reason that the more homogeneous offices do not perform better despite higher levels of social goods provision is that they do not have as diverse a portfolio of skills, talents, and interests on which to draw.

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

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

ductivity and wages. Hellerstein, Neumark, and Troske (1999) estimate that women's marginal productivities are less than men's, but that women's wages are lower still.

ours, must grapple with the question of how to measure that stock.[3] One possibility would be to measure the size and nature of social networks, as was done in Karlan, Mobius, Rosenblat and Szeidl (2009). They present a model of social capital as social collateral, one in which an intermediary within a social network can facilitate informal lending or borrowing in the absence of legally enforceable contracts. They then test that model on social networks data in Peru. Such a measure would not be relevant in our setting, of course—all employees in a particular office would know each other well—but that paper suggests that the informal exchange of favors may be an important component of social capital. In our setting, those favors would occur within a firm and could be well proxied by a measure of how cooperative an office is.

Survey responses may be the best way to gauge such phenomena.[4] Indeed, we have data from employee surveys in our firm, such as responses to the question of how cooperative the office is and how high morale is. Glaeser, Laibson, Scheinkman and Soutter (2000) use survey data as well, in conjunction with a "Trust" game, to gauge social capital in their study. Unlike them, we do not have responses to questions about trust, though.

Two features of our environment deserve emphasis. First, unlike many of the papers studying how diversity affects social goods provision, or papers studying social capital more generally, we look at these questions in a market setting. Second, our specific setting is within the firm. A striking feature about this environment is that the firm has incentives to foster social capital to advance its objectives. In particular, the firm may wish to attract and reward workers to foster cooperation and reciprocation on the job. Certainly, social capital created in the workplace may have positive externalities beyond the firm, but we do still have an entity, in our case the firm, which may internalize some of the externalities associated with social capital. Also,

[3] In some situations, a direct measure of the *provision* of social goods, such as whether a soldier deserts, might be available. That is an example of an act which contributes to the stock of social capital as opposed to a measure of the stock.

[4] See Putnam (2000) for a detailed account of the use of survey data to measure social capital.

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 mechanims 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, $\epsilon_j \sim \mathcal{U}[0,1]$ Each must choose two efforts 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, $U_j = W_j - c(e_I(j) + e_C(j)) - (1 - e_C(j))(r\bar{e}_C + \epsilon_j)$. W_j is his wage, c is a parameter 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 $(r\bar{e}_C + \epsilon_j)$ 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.

We highlight a couple of the results of the model here which are particularly relevant for our empirical exercise. First, they note that the level of r affects steady state cooperation (holding wage policy fixed). High r means that it is more likely that $e_C = 1$ is a steady state of the repeated model and low r means that $e_C = 0$ is more likely as a steady state. Second, with high r the model can have multiple steady states selected by initial conditions. In particular, a high initial average cooperative effort likely results in cooperative effort staying high, whereas a low intial $\bar{e}_C$ likely results in $\bar{e}_C$ staying low.

For our empirical setting, we are interested in the channels through which diversity can affect both social goods provision and firm performance. One channel comes immediately from the RZ model if one interprets reciprocity as being a function of diversity. In other words, if a firm (or office within a firm) is more homogeneous, its level of reciprocity could be higher because employees are more willing to contribute to a social good in a community where others are similar to them.[5] A second channel is that we could modify measured output $\hat{Q}$ to include an extra term h which is a direct function of heterogeneity. One interpretation of this extra term is that a more heterogenous office has a broader portfolio of skills and experiences to contribute and may, therefore, be more productive. Finally, although the RZ model is hard-wired to ensure that cooperative effort never exceeds the firm's optimal level, one could imagine that employees could have a social preference for cooperation that is

[5] Of course the relationship between diversity and social goods provision could be the opposite of the one just posited—this is one of our empirical questions.

different from the firm's preference. In that case, the guilt term in employee utility might continue to be present even if the optimal amount of cooperation from the point of view of the firm had been achieved, and equilibria could exist where cooperative effort is over-supplied.

Although we do not think of our paper as a formal test of this or any theoretical model, we should note a few empirical implications of this model which could inform our analysis. First, if less heterogeneity leads to higher values of r, higher levels of cooperation are likely to result. These higher levels of cooperation could lead to higher output (which would be the case in the base model) or lower output if the social preference is for excess cooperation. Also, heterogeneity could have a direct effect on output through h. These are the implications that we will explore with our main regressions. Two interesting but less central implications come out of the model. 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 and 2) more output persistence in high r offices. We will revisit these implications as well in the results section.

4 Data

The data on which we base our analysis were provided to us by a professional services firm which operates over sixty offices in the United States and abroad. Their offices range in size from just a few employees to nearly 100 at their headquarters. The data consist mostly of extensive employee satisfaction surveys which were administered approximately annually from 1995 to 2002. These surveys were commissioned by the firm, with anonymous employee responses. Table 1 contains summary statistics on the variables we created with these data, which we describe below.

First, from the survey responses, we can identify the office, gender, and tenure of the individual employees, enabling us to create office-level measures of diversity in those two dimensions. For gender, we calculated the standard deviation of a dummy

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
At the employee level:					
Satisfaction	1707	3.943	0.990	1	5
DPerception	1709	4.702	0.695	1	5
Morale	1683	3.592	1.017	1	5
Cooperate	1541	4.038	1.036	1	5
Male	1648	0.329	0.470	0	1
TenureYears	1665	2.570	2.087	0.25	7
At the office-year level:					
Unemploy	272	4.77	1.83	1.4	12.2
Number	272	4.91	3.11	2	19
AvgSatisfaction	272	4.06	0.57	2	5
AvgDPerception	272	4.73	0.36	3	5
AvgMorale	272	3.73	0.66	1	5
AvgCooperate	251	4.14	0.64	2	5
AvgGender	272	0.29	0.25	0	1
AvgTYears	272	2.32	1.14	0.25	6.25
GendDiversity	272	0.58	0.42	0	1
TenureDiversity	269	0.11	0.11	0	0.60
Revenues in thousands	340	3219	3500	0.1	23,900

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 variables to capture other dimensions of firm diversity. For tenure diversity, we calculated the standard deviation of tenure for each office, and then divided by the number of employees in the office. Finally we scaled the expression linearly so that the measure takes on values of 0 for offices where everyone has worked for the firm the same amount of time and positive values for offices with some variance in the amount of time the employees have worked there, 1 being an upper bound in our data set.

In addition, we construct employee-level measures based on survey responses, *Satisfaction*, *Cooperate*, and *Morale*. These are based on the following questions of the survey, respectively:

Taking everything into account, how satisfied are you with your company as a place to work?

(A) very satisfied
(B) satisfied
(C) neither satisfied not dissatisfied
(D) dissatisfied
(E) very dissatisfied

There is good cooperation among people in my office.

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

Morale in my office is generally

(A) excellent
(B) good
(C) so-so
(D) poor
(E) very poor
(F) don't know/NA

As we noted in section 2, "social capital" refers to trust and norms of reciprocity that facilitate cooperation, here within a firm. An auditor would not be able to find social capital within a firm's books, but social capital could still vary across offices, and have very real consequences for ultimate outcomes. We therefore rely on indicators or proxies for social capital rather than a direct measurement. We view *Cooperate* as the most literal measure of social capital, or social goods provision, since employees are effectively asked to characterize the extent of the norm of reciprocity within the office. For robustness, we employ additional indicators of employee attitudes. *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

[6] Putnam (2000, p. 90) notes that "People with friends at work are happier at work." If people are less (or more) likely to become friends with co-workers as the office becomes more diverse, then that is one channel for diversity to influence job satisfaction and ultimately firm performance.

[7] We relied on a number of different sources to track down demographics for foreign cities. In particular, we thank William Wheaton for providing us with data on office rental rates by city.

Table 2: Summary Statistics, Continued

Variable	Obs	Mean	Std. Dev.	Min	Max
At the city level:					
CAvgAge	61	33.9	2.7	29.6	41.7
CPolitics	47	75.3	58.8	1	227
CPercMinority	64	43.6	20.5	2.0	89.5
CPercMale	64	48.8	1.2	46.5	51.4
COfficeRent	59	42.15	37.10	15.60	197.80
in annual dollars per ft^2					
CPopulation	67	1462	1818	81	8008
in thousands					

CPercMinority, the percent of minority residents in a city, the definition of minority varied by country so that, for instance, whites were considered part of the minority population in Japanese cities but not in US cities. Detroit, again, was at an extreme, with the maximum value in our data set of 89.5%. Nagoya, Japan, had our minimum value, 2%.

5 Results

5.1 Social Capital

We turn first to our results on the determinants of social capital within the office. To do so, we use our employee-level data and focus on explaining perceived levels of cooperation. Most particularly, we will be interested in measures of diversity as explanatory variables, but we will also control for various employee, office, and city characteristics.

Tables 3 and 4 contain results of these regressions. There are separate regressions for three dependent variables, *Cooperate*, *Satisfaction*, and *Morale*, and the results for *Cooperate* are reported in Tables 3. The explanatory variables consist of measures 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, *AvgGender*, and, in some specifications, city-level measures such as the percent male, *CPercMale*, the percent minority, *CPercMinority*, the log of population, *LogCPopulation*, the average age, *CAvgAge*, and office rental rates, *COfficeRent*. We do not include office fixed effects in the first two specifications, but include them in the last.[8]

Turning first to specification (1), results which explain the level of cooperation in the offices, we see that higher levels of gender diversity (a more equal mix of men and women) are associated with lower levels of cooperation. This result, represented by the estimated coefficient of -0.168 on *GendDiversity*, has a p-value of 0.09. The magnitude suggests that moving from an office evenly split between men and women to either an all-male or all-female office, holding constant other characteristics, would increase cooperation about one-sixth of a point on a five-point scale.[9] We also see that higher levels of tenure diversity (a mix across number of years that employees in an office had worked in the firm) were associated with higher levels of cooperation, although this result is not statistically significant at traditional levels.

A striking result to come out of specification (1) is the importance of *AvgDPerception*. Offices where the employees, on average, believe their employer to be accepting of diversity are more cooperative. In addition to being highly significant (with a t-statistic of 4.03), its magnitude is also noteworthy. The estimated coefficient of 0.524 suggests that increasing office-average response to the question about how accepting

[8] Blanchflower and Oswald (2004) use a qualitative response model to explain determinants of survey responses due to their discrete nature. We agree with the logic of their approach, although for ease of interpretation we will report linear regression results. Our major conclusions are robust to estimating an ordered probit model.

[9] Of course one cannot vary *GendDiversity* in an office without also varying *Male* and *AvgGender*, but their estimated effects on *Cooperate* were small enough to ignore for this counterfactual.

the company is of diversity by one point increases cooperation more than a half point on the same scale. This result bears a more careful examination. Initially, it seems at odds with the first result that more gender diversity is associated with less cooperation. One can think of at least two ways to reconcile these results. First, it is possible that our measure *AvgDPerception* is a proxy for actual diversity in an office, but diversity on dimensions other than gender and tenure. In addition to gender differences, the question specifically mentions ethnic and lifestyle differences as well, dimensions on which we have no data. We believe a more likely explanation is that there is a distinction between a company which provides an environment accepting of diversity and one which has actual diversity. The employees seem more cooperative (and more satisfied overall, as we see below) in an environment *supportive* of diversity but lacking in actual diversity.

The impact of *TenureYears* is negative but not statistically significant. One might imagine that those with higher tenure would be more well-integrated into the office culture, but other factors, such as boredom or job fatigue, might offset this. We included *Year* to absorb any possibly spurious association with time. It is not significant in specification (1).

We wanted to ensure that changes in office-level gender diversity were not affecting the sample's level of *Cooperate* merely by adding more men or women to the sample. So we control for the gender of the respondent with *Male*. The effect is tiny and not statistically significant. Similarly, we also control for the fraction of the office that is male, with *AvgGender*. In specification (1) the effect is, again, not significant.

In interpreting these results, it is important to note that specification (1) does not contain office fixed effects. One might think that a hypothetical San Francisco office differs systematically from a hypothetical Sheboygan office, and these differences should be controlled for in the estimation. It is also the case, however, that our identification of certain effects might be coming primarily from the cross-section, an identification that would be wiped out with the inclusion of fixed effects. In particular, we have, on average, four years of data[10] 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 off of the cross-section. In order both to control for some city (office) characteristics and to preserve some identification off 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 off 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. Quite a few offices were either opened or closed 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 metropolitan area. This potentially controls for local macroeconomic shocks. Finally, we include *YearsOpen*, which is a variable equal to the year of the observation minus the year of the first observation in our data set for that particular office, and it is meant to control for smaller revenues that offices would generate before they became established in a city.

Table 5 presents results from three specifications, our base specification with a smaller set of city covariates, our augmented specification with the full set of city covariates (but a smaller number of observations due to missing values), and a specification with office fixed effects. Looking across all specifications, the estimated effect of *AvgDPerception* is not statistically significantly different from zero. Recall that this perception of the firm's acceptance of diversity was an important determinant of office cooperation, satisfaction, and morale. But, interestingly, it does not appear to be associated with a revenue payoff. Note that such a result indicates the important distinction between "intermediate goods" such as firm social capital and the ultimate outcome of interest for a firm. Also, a perception that the firm accepts diversity, leading to more cooperative and happier offices, could still yield pecuniary gains to firm owners that would not be picked up in this regression. For instance, high satisfaction could reduce the salaries employees are willing to accept, even if such a perception does not increase revenues.

Turning to additional results in Table 5, higher levels of *GendDiversity* are positively and significantly associated with office revenue in our base specification (1). The estimated coefficient of 0.45 implies that going from an office that is either all male or all female to an office split equally between the sexes would be associated with a revenue gain of 45%(!). Of course, the implications for firm behavior are less clear cut, since the firm might have to make additional changes in order to change the gender composition of its workforce, but the relationship uncovered in the sample is still of interest. These results are consistent with a conclusion that the actual diversity of an office, at least in the gender dimension, gives it the diversified portfolio 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 environment than a hypothetical Sheboygan office. And of course the Bay Area experienced macroeconomic shocks associated with the technology industry over this time period. So the San Francisco office could have both higher revenue and higher gender diversity than the Sheboygan office, but the gender diversity would not be responsible for the revenue differential. We have the same concern regarding identification in the presence of office fixed effects here as we had previously, so we included specification (2) as an intermediate step, controlling for a variety of city characteristics which could be correlated with both diversity in an office and revenues. The core results are robust to the inclusion of additional covariates, despite the significant drop in observations. In particular, the magnitude and significance of the *GendDiversity* coefficient remains unchanged.

In column (3), we also report the results of a specification with office-level fixed effects. When we control for the office fixed effects, the estimated contribution of *GendDiversity* to office level revenue is no longer statistically significant. As in our results for employee satisfaction, much of our identification of a genuine effect may be coming from the cross-sectional variation.

TenureDiversity is associated with a large, negative, and statistically significant revenue effect, a result that survives including the fixed effects. Of course the offices themselves do not assign tenure diversity randomly. A new office could have difficulty in generating revenue compared to an older, more established office, and the new office could also have lower tenure diversity because a large group of employees could be hired at the same time at the opening of the office. It is interesting to note, though, that the negative tenure diversity effect exists in the presence of a positive average tenure effect. Including an office-level fixed effect does not completely control for this possibility, since a new office could still have a different revenue stream over time than an old office.

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 $Log(Revenues)$ 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 $GendDiversity \leq 0.5$, 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 postive. We do not have a particular interpretation for this finding.

[11]Multiple equilibria for high r offices could but need not result in a bimodal distribution of output. If the equilibria were close enough together relative to the variance of any error in the system, the result could 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.

In our second set of results, we investigate the determinants of office-level revenues. We find that the perception that the firm accepts diversity has no estimated payoff in this dimension. Interestingly, the actual gender diversity is associated with a positive contribution to revenues, although this effect is diminished once office-level fixed effects are included.

Interestingly, the revenue results suggest that whatever detrimental impacts actual gender diversity had on the formation of firm social capital were outweighed by the direct contribution of diverse personnel to the tasks at hand.

Although two of the three authors are Red Sox fans, we are reminded of the lesson of the 1978 Yankees. Although the day to day operation of that team was far from harmonious, the individual players contributed the diverse set of skills necessary for collective success.

Table 3: Results of employee-level regressions

	Dep. variable: *Cooperate*		
Explanatory variables	(1)	(2)	(3)
GendDiversity	-0.168	-0.086	0.048
	(-1.74)	(-0.67)	(0.36)
TenureDiversity	0.682	0.022	-0.542
	(1.39)	(0.04)	(-1.07)
AvgDPerception	**0.524**	**0.535**	**0.608**
	(4.03)	(3.52)	(6.36)
TenureYears	-0.016	0.003	0.007
	(-1.24)	(0.16)	(0.52)
Year	-0.004	-0.015	-0.029
	(-0.21)	(-0.75)	(-1.78)
Male	0.002	0.093	0.014
	(0.02)	(1.32)	(0.22)
AvgGender	-0.050	-0.172	-0.336
	(-0.33)	(-0.87)	(-1.40)
Log(CPopulation)		-0.046	
		(-1.13)	
CPercMale		-0.029	
		(-0.72)	
CPercMinority		-0.003	
		(-0.70)	
CAvgAge		-0.008	
		(-0.32)	
COfficeRent		0.001	
		(0.92)	
Constant	1.738	3.855	1.450
	(2.70)	(1.70)	(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: *Satisfaction* (1)	(2)	(3)	*Morale* (4)	(5)	(6)
GendDiversity	-0.154	-0.128	0.020	**-0.351**	**-0.226**	-0.089
	(-1.83)	(-1.80)	(0.17)	(-3.59)	(-2.24)	(-0.77)
TenureDiversity	0.248	0.198	-0.383	0.836	0.430	0.417
	(0.74)	(0.46)	(-0.92)	(1.94)	(0.89)	(0.98)
AvgDPerception	**0.621**	**0.684**	**0.672**	**0.634**	**0.691**	**0.795**
	(7.90)	(8.89)	(7.98)	(5.16)	(5.05)	(9.33)
TenureYears	-0.035	**-0.049**	-0.019	**-0.063**	**-0.054**	**-0.042**
	(-1.87)	(-2.84)	(-1.53)	(-5.66)	(-3.02)	(-3.33)
Year	**-0.072**	**-0.064**	**-0.082**	**-0.066**	**-0.058**	**-0.082**
	(-5.36)	(-4.62)	(-6.34)	(-3.66)	(-3.28)	(-6.25)
Male	0.021	-0.039	0.029	-0.043	-0.048	-0.035
	(0.41)	(-0.72)	(0.52)	(-0.74)	(-0.62)	(-0.63)
AvgGender	-0.102	0.077	-0.359	0.215	0.226	-0.028
	(-0.42)	(0.70)	(-1.77)	(1.05)	(1.39)	(-0.14)
Log(CPopulation)		0.025			-0.038	
		(0.68)			(-0.71)	
CPercMale		-0.004			-0.020	
		(-0.13)			(-0.65)	
CPercMinority		-0.002			0.000	
		(-0.86)			(-0.12)	
CAvgAge		-0.002			-0.002	
		(-0.12)			(-0.08)	
COfficeRent		0.001			**0.004**	
		(1.16)			(2.89)	
Constant	1.635	1.491	1.411	1.270	2.098	0.474
	(4.39)	(0.78)	(3.38)	(2.09)	(1.12)	(1.12)
Observations	1579	1233	1579	1558	1216	1558
Office fixed effects?	No	No	Yes	No	No	Yes

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

Table 5: Results of office-level regressions

	Dependent variable:		
Explanatory variables	*Log(Revenues)* (1)	(2)	(3)
AvgTYears	**0.298**	**0.226**	**0.247**
	(3.76)	(3.31)	(3.44)
AvgDPerception	0.041	-0.071	0.009
	(0.23)	(-0.26)	(0.06)
GendDiversity	**0.450**	**0.453**	-0.065
	(2.60)	(2.74)	(-0.44)
TenureDiversity	**-2.782**	**-2.488**	**-2.697**
	(-3.19)	(-2.72)	(-4.03)
Year	**-0.369**	-0.174	
	(-6.12)	(-1.86)	
YearsOpen	**0.464**	**0.261**	**0.121**
	(6.86)	(2.61)	(3.73)
Unemploy	-0.040	**-0.098**	-0.049
	(-0.99)	(-2.16)	(-0.83)
Log(CPopulation)	0.046	**0.221**	
	(0.51)	(2.51)	
CPercMale		0.063	
		(1.62)	
CPercMinority		0.005	
		(1.21)	
CAvgAge		-0.046	
		(-1.27)	
COfficeRent		**0.022**	
		(3.75)	
CPolitics		**-0.004**	
		(-3.52)	
constant	14.027	11.405	14.081
	(13.54)	(4.16)	(17.56)
Observations	269	200	269
Office fixed effects?	No	No	Yes

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

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