

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 gender-homogeneous offices enjoy higher levels of social goods provision but that those offices do not perform any better and may actually perform worse.

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 (2004) 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 (2005)). (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. We would presume that effect would hinder performance of most types—we measure performance with office-level revenue—but it is possible that diversity could enhance productivity in other ways. Which effect dominates then becomes an empirical question, and one that we can, in principle, answer with our data. Again, we look both at the effects of diversity as well as the perception among the employees that the firm supports diversity. We find that this office-level perception that the firm supports diversity has a negligible association with office-level revenues. Actual gender diversity, on the other hand, is associated with higher revenues, although this latter effect diminishes when office-level fixed effects are included. In addition, we find both average tenure and tenure diversity in the office to be important explanatory variables.²

²There is a related but distinct literature on how gender composition affects workplace productivity and wages. Hellerstein, Neumark, and Troske (1999) estimate that women’s marginal

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.

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 ours, must grapple with the question of how to measure that stock.³ One possibility

productivities are less than men’s, but that women’s wages are lower still.

³In some situations, a direct measure of the *provision* of social goods, such as whether a soldier

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, 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 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.

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

these transactions through an explicit contract. Rather, they are best accomplished by employees exchanging long term favors.

Not surprisingly, a sizeable management literature exists addressing related issues. In that literature, the emphasis is often prescriptive, focusing on questions of how firms can best navigate an increasingly diverse labor market and which management practices are best suited for a diverse group of employees. Some of the literature, though, has asked positive questions similar to ours. Two comprehensive surveys of issues surrounding diversity in the workplace are Williams and O'Reilly (1998) and Shore, *et al.*, (2009).

In the Williams and O'Reilly (1998) taxonomy, diversity can affect “group process” and “group performance.” In the articles they survey, there is a robust finding that diversity hinders “group process” and, at least in the field studies, a suggestion that it also hinders “group performance.” Although our notions of “social capital” and “performance” might not map directly onto “group process and performance” studied there, we still think of our paper as potentially contributing to this literature.

Another related paper is by Gant, Ichniowski, and Shaw, K. (2002), which studied social capital and productivity in a workplace. They utilized both survey data and direct observation, whereas we rely on the employee surveys and the office revenue data.

3 Theory

In discussing these ideas, we find it useful to refer to a model to provide some structure and insight into the mechanisms at play. Rob and Zemsky (2002) (hereafter RZ) provide such a framework.⁵ 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

⁵Based on the social psychology literature, Roberge and Van Dick (2010) provide an informal theory but no formal model of when and how diversity increases group performance.

diversity, their model can be interpreted and modified to incorporate various channels through which diversity can operate.

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 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, $U_j = W_j - c(e_I(j) + e_C(j)) - (1 - e_C(j))(r\bar{e}_C + \epsilon_j)$. 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. The strength of guilt is a function of office-level reciprocity, average cooperative effort, and employee j 's idiosyncratic guilt tendency.

Two results are relevant to our empirical exercise. First, the level of r , reciprocity, 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 initial \bar{e}_C likely results in \bar{e}_C staying low.

We can also modify the model to accommodate diversity effects, both on social goods provision and on 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.⁶ A second channel is that we could modify measured output \hat{Q} to include an extra term h , allowing output to be a direct function of heterogeneity.⁷

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.

⁶Of 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.

⁷Although 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 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.

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>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> | 269 | 4.77 | 1.84 | 1.4 | 12.2 |
| <i>Number</i> | 269 | 4.94 | 3.12 | 2 | 19 |
| <i>AvgSatisfaction</i> | 269 | 4.06 | 0.58 | 2 | 5 |
| <i>AvgDPerception</i> | 269 | 4.73 | 0.36 | 3 | 5 |
| <i>AvgMorale</i> | 269 | 3.74 | 0.66 | 1 | 5 |
| <i>AvgCooperate</i> | 248 | 4.14 | 0.64 | 2 | 5 |
| <i>AvgGender</i> | 269 | 0.29 | 0.25 | 0 | 1 |
| <i>AvgTYears</i> | 269 | 2.32 | 1.14 | 0.25 | 6.25 |
| <i>GendDiversity</i> | 269 | 0.58 | 0.41 | 0 | 1 |
| <i>TenureDiversity</i> | 269 | 0.11 | 0.11 | 0 | 0.60 |
| <i>Revenues</i> in thousands | 269 | 3794 | 3660 | 3 | 23,900 |

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 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 .60, between *Satisfaction* and *Cooperate* is 0.36, and between *Morale* and *Cooperate* is .52.) 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.⁸

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 2.⁹ 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

⁸Putnam (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.

⁹We 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: | | | | | |
| <i>CAvgAge</i> | 61 | 33.9 | 2.7 | 29.6 | 41.7 |
| <i>CPolitics</i> | 47 | 75.3 | 58.8 | 1 | 227 |
| <i>CPercMinority</i> | 64 | 43.6 | 20.5 | 2.0 | 89.5 |
| <i>CPercMale</i> | 64 | 48.8 | 1.2 | 46.5 | 51.4 |
| <i>COfficeRent</i> in annual dollars per ft ² | 59 | 42.15 | 37.10 | 15.60 | 197.80 |
| <i>CPopulation</i> in thousands | 67 | 1462 | 1818 | 81 | 8008 |

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 *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%. Note, finally, that our office-level data set does not include the firm headquarters, only the field offices.

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.¹⁰

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.¹¹ 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

¹⁰Blanchflower 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.

¹¹Of 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.

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 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.

One might be concerned that these results are affected by “common method bias,” a bias resulting from the fact that our dependent variable and one explanatory variable, *AvgDPerception*, were gathered with a common method, an employee survey, and could therefore share a component attributable to the method as opposed to the underlying constructs.¹² Such a situation could result in estimated coefficients being biased upward. The raw correlation between *Cooperate* and *AvgDPerception*, 0.16, suggests the problem is unlikely to be serious, coupled with the fact that *AvgDPerception* is an office average of individual answers, not the answers themselves. Nevertheless, we also reestimated specification (1) without *AvgDPerception*. The results for the remaining variables were largely unaffected. No estimated coefficients changed sign at all or magnitude substantially, and only one 5% significance tests changed—the coefficient of *GendDiversity* became significant at the 5% level with a t -statistic

¹²See Podsakoff *et al.* (2003).

of 2.12. Caution in placing too much weight on the estimated coefficient of *AvgDPerception* may be warranted, but even in the presence of common method bias, we can be confident that other results would be largely unaffected.

The impact of *Tenure Years* 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 data¹³ 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), adding a rich set of city-level covariates. None of these we include are statistically significant in this regression, but the other results are affected. In particular, the coefficient

¹³We 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.

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 gender 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 gender 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 or management 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. Or a firm might move a manager from an office with high levels of cooperation to one with low levels to improve the latter office, mechanically changing the composition of those offices. 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. Furthermore, even though employee surveys were conducted, a top executive in the firm claimed that no analysis other than ours had ever been performed on those data. Hiring and staffing were not random, of course, but elements of those processes 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.

We now 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 four 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), a specification including number of employees in the office, 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 variable in the employee-level regressions. 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 0.41 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 41%(!). 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 gender diversity of an office improves office performance significantly.

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, ranging from demographics to politics, 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 sign and significance of the *GendDiversity* coefficient remains unchanged.¹⁴

¹⁴At the suggestion of a referee, we estimated this specification excluding data from the sole field

In column (4), 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. This result stands in contrast with those from the employee-level regressions where *TenureDiversity* has no significant effect. So, although we find no evidence that having an office where employees were hired at different times is associated with lower levels of cooperation, we do find evidence that it is associated with lower levels of performance. While we cannot directly test for potential mechanisms driving these results, Pfeffer (1983) offers a possibility: employees arriving at a firm at the same time might communicate more. One could imagine improved communication within an office not being reflected in our measures of social goods provision but affecting office performance. We should note that 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. We do, however, include *YearsOpen* and *AvgTYears* to control for that situation, both of which have positive and significant effects.

Note that in column (3) we did include a specification with number of employees as an explanatory variable, although we suggest caution in interpreting those results. 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 feel 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. The potential endogeneity induced by that phenomenon makes office in the same state as the headquarters. Magnitudes and significance of the results were virtually unchanged.

interpretation of column (3) results problematic and also highlights that results in the other columns should be viewed as a reduced-form estimate of patterns in the data as opposed to any causal relationship.

5.3 Additional Results

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)¹⁵ 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. The same would be true for higher dispersion. A kernel regression of the residuals from offices with $\text{GendDiversity} \leq 0.5$, 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, consistent with the existence of multiple steady states. 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. We found, instead, that the estimated coefficient was significant but positive. Tests for specific empirical implications of RZ, then, leave us with mixed results.

¹⁵Multiple 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 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. At the same time, tenure diversity had little measurable association with proxies for 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, actual gender diversity is associated with a positive contribution to revenues, although this effect is diminished once office-level fixed effects are included. In contrast, tenure diversity is associated with lower revenues.

We note an interesting contrast between our results on tenure diversity and gender diversity. Tenure diversity had little association with our measure of social capital but seemed to have a strong negative association with performance. Gender diversity seems to affect the functioning of the firm in quite a different way. Our first set of results suggests that gender diversity could have detrimental impacts on the formation of firm social capital, but the revenue results suggest that whatever impacts it had were outweighed or at least cancelled by the direct contribution of gender diversity in the office.

Table 3: Results of employee-level regressions

| | Dep. variable: <i>Cooperate</i> | | |
|-------------------------|---------------------------------|------------------------|------------------------|
| Explanatory variables | (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>COfficeRent</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>COfficeRent</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 |
| 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

| Explanatory variables | Dependent variable: | | | |
|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | <i>Log(Revenues)</i> | | | |
| | (1) | (2) | (3) | (4) |
| <i>AvgTYears</i> | 0.302 (3.75) | 0.234 (3.38) | 0.201 (3.34) | 0.251 (3.47) |
| <i>AvgDPerception</i> | 0.036 (0.20) | -0.081 (-0.29) | 0.100 (0.37) | 0.007 (0.04) |
| <i>GendDiversity</i> | 0.406 (2.30) | 0.311 (2.08) | 0.057 (0.37) | -0.124 (-0.68) |
| <i>TenureDiversity</i> | -2.804 (-3.20) | -2.524 (-2.74) | -1.068 (-1.06) | -2.691 (-4.02) |
| <i>AvgGender</i> | 0.132 (0.53) | 0.442 (1.98) | 0.514 (2.40) | 0.180 (0.54) |
| <i>Year</i> | -0.370 (-6.08) | -0.174 (-1.87) | -0.196 (-2.13) | |
| <i>YearsOpen</i> | 0.465 (6.82) | 0.262 (2.63) | 0.250 (2.55) | 0.121 (3.73) |
| <i>Number</i> | | | 0.129 (5.70) | |
| <i>Unemploy</i> | -0.041 (-1.02) | -0.106 (-2.32) | -0.095 (-2.20) | -0.051 (-0.86) |
| <i>Log(CPopulation)</i> | 0.052 (0.56) | 0.237 (2.62) | 0.178 (2.08) | |
| <i>CPercMale</i> | | 0.066 (1.74) | 0.012 (0.31) | |
| <i>CPercMinority</i> | | 0.005 (1.32) | 0.002 (0.49) | |
| <i>CAvgAge</i> | | -0.046 (-1.28) | -0.017 (-0.47) | |
| <i>COfficeRent</i> | | 0.022 (3.77) | 0.021 (4.06) | |
| <i>CPolitics</i> | | -0.004 (-3.77) | -0.002 (-2.46) | |
| <i>constant</i> | 14.005 (13.43) | 11.147 (4.05) | 11.932 (4.63) | 13.811 (16.88) |
| Observations | 269 | 200 | 200 | 269 |
| Office fixed effects? | No | No | No | Yes |

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

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Table 6: Data Appendix: Correlations of Key Variables

| Variables from Employee-level Regressions ($n = 1414$) | | | | | | | | | |
|--|---------------------|---------------|------------------|-----------------------|----------------------|------------------------|-------------|------------------|--------------------|
| | <i>Satisfaction</i> | <i>Morale</i> | <i>Cooperate</i> | <i>AvgDPerception</i> | <i>GendDiversity</i> | <i>TenureDiversity</i> | <i>Male</i> | <i>AvgGender</i> | <i>TenureYears</i> |
| <i>Satisfaction</i> | 1.00 | | | | | | | | |
| <i>Morale</i> | 0.60 | 1.00 | | | | | | | |
| <i>Cooperate</i> | 0.36 | 0.52 | 1.00 | | | | | | |
| <i>AvgDPerception</i> | 0.23 | 0.22 | 0.16 | 1.00 | | | | | |
| <i>GendDiversity</i> | -0.12 | -0.16 | -0.09 | -0.03 | 1.00 | | | | |
| <i>TenureDiversity</i> | 0.06 | 0.10 | 0.08 | 0.10 | -0.24 | 1.00 | | | |
| <i>Male</i> | -0.02 | -0.04 | -0.03 | 0.01 | 0.30 | -0.05 | 1.00 | | |
| <i>AvgGender</i> | -0.08 | -0.08 | -0.06 | 0.03 | 0.69 | -0.13 | 0.45 | 1.00 | |
| <i>TenureYears</i> | -0.12 | -0.16 | -0.04 | 0.00 | 0.08 | 0.06 | -0.02 | 0.07 | 1.00 |

| Variables from Office-level Regressions ($n = 269$) | | | | | | | | | |
|---|----------------------|------------------|-----------------------|----------------------|------------------------|------------------|------------------|-----------------|-------------------------|
| | <i>Log(Revenues)</i> | <i>AvgTYears</i> | <i>AvgDPerception</i> | <i>GendDiversity</i> | <i>TenureDiversity</i> | <i>YearsOpen</i> | <i>AvgGender</i> | <i>Unemploy</i> | <i>Log(CPopulation)</i> |
| <i>Log(Revenues)</i> | 1.00 | | | | | | | | |
| <i>AvgTYears</i> | 0.25 | 1.00 | | | | | | | |
| <i>AvgDPerception</i> | 0.01 | 0.05 | 1.00 | | | | | | |
| <i>GendDiversity</i> | 0.19 | 0.00 | 0.05 | 1.00 | | | | | |
| <i>TenureDiversity</i> | -0.20 | 0.42 | 0.08 | -0.08 | 1.00 | | | | |
| <i>YearsOpen</i> | 0.47 | 0.47 | -0.05 | 0.13 | -0.03 | 1.00 | | | |
| <i>AvgGender</i> | 0.02 | -0.07 | 0.10 | 0.57 | 0.03 | -0.03 | 1.00 | | |
| <i>Unemploy</i> | -0.05 | 0.10 | -0.12 | 0.10 | 0.01 | -0.02 | 0.06 | 1.00 | |
| <i>Log(CPopulation)</i> | 0.06 | -0.06 | -0.20 | 0.01 | -0.18 | 0.04 | -0.13 | 0.52 | 1.00 |