

## Ethnic diversity and firm performance: Evidence from India

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### Abstract:

We examine if the financial performance of firms in India depends on the level of ethnic diversity in the state or district in which they operate. Thus, using data on 1,199 listed firms in the materials, industrial and information technology sectors in India, we examine the impact of ethnic diversity on various measures of firm financial performance. Based on indices of fractionalization calculated for 15 states and 74 districts in which these firms operate, we find evidence of negative effects of ethnic diversity on firm performance. These results are robust to endogeneity and alternative ways of measuring diversity.

**Keywords:** ethnic diversity, fractionalization, polarization, firm performance, minorities, India

**JEL:** J15, L25

## 1. Introduction

Issues of firm performance remain important and have been at the forefront of academic discussions for several decades. Consequently, the literature on the determinants of firm performance and profitability continues to grow. This literature is inter-disciplinary and cuts across disciplines such as finance, economics, and management, among others. Within the economics literature, studies have explored several determinants including firm-specific factors, industry-specific factors, and macroeconomic factors, although various economic theories underpin the study of these factors. For instance, economic theory around industrial organization (IO) provides a useful theoretical framework that explains how market structure affects firm strategy, performance, and profits (Hansen & Wernerfelt, 1989). This theory emphasises how market factors determine firm performance and is a key basis for which several studies into the determinants of firm performance are conducted. A key argument in this area suggests that industry structure is a major determinant of firm performance, hence the structure-conduct-performance (SCP) model which demonstrates a relationship between market structure and firm performance (Evanoff & Fortier, 1988; Hannan, 1991).

Another strand of literature, in the tradition of Bain (1956), examines industry characteristics that affect performance and focuses on the effects of variables such as capital intensity, advertisement, growth, research and development, and industry concentration among others (Hou & Robinson, 2006; Klette & Johansen, 2000; Lepak et al., 2003; Zhao & Zou, 2002). Similarly, relating firms to their competitors, and how that affects performance, existing studies have also explored the effect of relative market share on firm performance (Anderson et al., 1994; Pelham & Wilson, 1995). An important strand of research within this stream

examines the role of firm size in explaining firm performance (Hall & Weiss, 1967; Lawrence et al., 2006).

Overall, an important inference from the various strands of the literature suggests that no one factor can be singled out as the main determinant or driver of firm performance, but rather various factors play unique roles. However, despite the large body of literature that examines the determinants of firm performance, not much is known about the role of ethnic diversity in influencing firm performance. Awaworyi Churchill et al. (2017) and Awaworyi Churchill (2018) provide some evidence in the context of manufacturing firms in China and listed firms across Africa, respectively. Navon (2010) conducts a related study using a matched employer-employee dataset of Israeli manufacturing firms. However, this study focuses on the role of human capital spill overs in firm productivity. Similarly, Parrotta et al. (2014) also use an employer-employee matched dataset from Denmark to examine the role of skill and ethnic diversity on total factor productivity at the firm level and provide mixed evidence on the effects of diversity. A related strand of literature also uses various datasets to examine the impact of age, education, and gender diversity in the workplace on firm performance (see, Garnero et al. (2016) for a review).

In this study, we contribute to the literature by examining the impact of ethnic diversity on 1199 firms in India. Specifically, our study seeks to answer the questions: do ethnic differences present implications for the performance of firms in India? Are firms affected by the level of diversity in the states or districts in which they operate? Given the unavailability of matched employer-employee datasets for India, we work with the assumption that firm-level diversity is a reflection of or is influenced by the level of diversity in the states and districts in which firms operate. Thus, consistent with Awaworyi Churchill et al. (2017), we

examine if firms are less or more likely to be productive if they operate in locations (i.e., states or districts) with higher levels of ethnic diversity?

We examine the hypothesis that differences in ethnic diversity across Indian States and districts can explain differences in the performance of firms. We focus on firms in the materials, industrial and information technology sectors as determined by the Global Industry Classification Standard. Firms in these categories are mostly into technology and manufacturing and are important for India given that they represent the fastest growing industries that contribute significantly to economic development in India (Arnold et al., 2016; Dangayach & Deshmukh, 2005; Szirmai & Verspagen, 2015). India also makes for an important case and focusing on it bridges important gaps in the literature. For instance, despite being one of the largest and important economies, relatively little is known about the performance of Indian firms (Majumdar & Bhattacharjee, 2010). Further, India is characterised by high levels of diversity, and thus it is worthwhile to understand the implications of this diversity.

Our study therefore relates to two streams of studies within the existing literature, and ties together discussions from both the literature on the determinants of firm performance, and the literature on the effects of ethnic diversity. Our paper relates to existing studies on the determinants of firm performance as it provides a new perspective on understanding the factors that influence firm performance in India. Furthermore, our study also relates to the growing literature on the effects of ethnic diversity by contributing to our understanding on how ethnic diversity affects firm performance. With regards to our contribution to the ethnic diversity literature, our study is timely as it responds to calls for studies that examine the impact of ethnic diversity within-countries rather than across countries (Gisselquist et al., 2016). Our results suggest that ethnic diversity negatively influences firm financial

performance. Specifically, across our different estimation types, we find negative effects of ethnic diversity on firm performance indicators such as return on assets, net turnover, and firm revenues.

The remainder of the study is structured as follows. The next section discusses the data while Section 3 presents the empirical methods. Section 4 presents the results and Section 5 concludes.

## 2. Data

Firm-level data are drawn from Compustat hosted by the University of Pennsylvania's Wharton Research Data Services. Compustat is a financial and statistical database which contains market information on several listed companies throughout the world. Our measures of firm financial performance are consistent with the literature and include return on assets, net sales/turnover, and total revenue (Awaworyi Churchill et al., 2017; McGahan, 1999).

Our indices of diversity are calculated based on the 2001 Indian census data. We generate two measures of diversity, namely a fractionalization index, which is basically a Herfindahl index measuring concentration across ethnic groups (Alesina et al., 2003) and a polarization index, which highlights the dimension of conflict in diversity (Montalvo and Reynal-Querol, 2005). Specifically, fractionalization is generated using the Herfindahl formula as follows:

$$FRAC_i = 1 - \sum_{j=1}^J n_{ij}^2$$

where  $FRAC$  is the index of fractionalization and  $n_{ij}$  is the population share of ethnic group  $j$  in state/district  $i$ . The above index denotes the probability that two randomly selected individuals in a given state/district belong to different ethnic groups.

Ethnic polarization indices are generated using the Montalvo and Reynal-Querol (2005) approach as follows:

$$POL = 1 - \sum_{j=1}^J \left( \frac{0.5 - n_{ij}}{0.5} \right)^2 \cdot n_{ij}$$

where  $POL$  is the index of polarization and measures the distance of any distribution of ethnic, linguistic, and religious groups from the situation that leads to the maximum conflict and  $n_{ij}$  is as defined previously.

Based on the 2001 census we compute the indices of ethnic diversity using ethnic group classifications that are based on a distribution of population speaking six categories of languages in India, namely Indo-European, Dravidian, Austro-Asiatic, Tibeto-Burmese, Semito-Hamitic and an “others” category.<sup>1</sup> The “others” category here captures people speaking languages not grouped as part of the first five language categories. For robustness, we also use indices of linguistic diversity which are based on a categorization of 123 languages in India as well as indices of religious diversity which are based on the seven religious groups in India namely, Hindu, Christian, Muslim, Sikh, Buddhist, Jain and other religions. Data on the distribution of population at the state and district levels by main languages spoken and religious affiliation is obtained at the online Census of India repository.<sup>2</sup>

<sup>1</sup> [http://www.censusindia.gov.in/Census\\_Data\\_2001/Census\\_Data\\_Online/Language/statement9.aspx](http://www.censusindia.gov.in/Census_Data_2001/Census_Data_Online/Language/statement9.aspx)

<sup>2</sup> This information can be retrieved at [http://www.censusindia.gov.in/DigitalLibrary/Archive\\_home.aspx](http://www.censusindia.gov.in/DigitalLibrary/Archive_home.aspx)

Overall, our study is based on indices of diversity for a cross-section of 15 states and 74 districts in India, as well as 1199 listed firms in the materials, industrial and information technology sectors.<sup>3</sup> Given the cross-sectional nature of our indices of diversity, consistent with the literature (Alesina & Zhuravskaya, 2011; Awaworyi Churchill et al., 2017; Easterly & Levine, 1997), we take the decadal average of firm level variables from 2001 to 2010.

### 3. Empirical Model and Approach

We specify a cross-sectional model like Awaworyi Churchill et al. (2017) and Alesina and Zhuravskaya (2011), among others. The model takes the form:

$$FP_{ji} = \alpha + \beta D_i + \sigma I_i + \delta' X_{ji} + \varepsilon_{ji} \quad (1)$$

$FP_{ji}$  represents firm financial performance for firm  $j$  located in state or district  $i$ .  $D$  represents the index of ethnic diversity.  $I$  represents income proxied by net state domestic product per capita or net district domestic income per capita while  $X$  represents firm-level covariates including invested capital and assets which serve as a control for firm size.<sup>4</sup>  $\varepsilon$  is the heteroskedastic error term.

Our baseline regressions are ordinary least squares (OLS) regressions with robust standard errors that account for heteroskedasticity. However, we also run two-staged least squares (2SLS) regressions to address endogeneity. Endogeneity is likely to be a problem if unobserved variables are correlated with our measures of firm performance and ethnic diversity. We use the lagged variable of fractionalization as instrument. Specifically, we use indices of

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<sup>3</sup> Table A1 and A2 in the appendix provides the list of states and districts, respectively.

<sup>4</sup> Income at the state level is from the Reserve Bank of India while district level income is drawn from the from the Planning Commission of India's [website](#). Firm size control variables are from the Compustat database.

fractionalization based on the 1991 census as instruments. Such lagged values of diversity have been used in the existing literature to address endogeneity (Glennerster et al., 2013). However, with some persistence in our outcome variables, endogeneity can remain an issue even with the lagged values as instruments, especially if the census does not date back far enough. Accordingly, data from an even older census would make for a stronger instrument however we do not have census information beyond 1991. Thus, to complement our external instruments and to ensure that our results do not suffer from weak instruments bias, we supplement the traditional 2SLS regressions with the Lewbel (2012) 2SLS approach. The Lewbel (2012) 2SLS approach deals with endogeneity using heteroskedasticity based instruments and is often used in the literature when external instruments are either weak or unavailable (Awaworyi Churchill & Mishra, 2017; Mishra & Smyth, 2015).

The relevant model could be expressed as follows:

$$FP = X'\beta_1 + EY_1 + \xi_1 \quad \xi_1 = \alpha_1 U + V_1 \quad (2)$$

$$E = X'\beta_2 + \xi_2 \quad \xi_2 = \alpha_2 U + V_2 \quad (3)$$

Let  $FP$  be firm financial performance and  $E$  be the measure of ethnic diversity.  $U$  denotes unobserved characteristics, which affects both firm financial performance and ethnic diversity.  $V_1$  and  $V_2$  are idiosyncratic errors. The Lewbel (2012) approach uses the heteroskedasticity in the data to estimate the 2SLS regression and involves taking a vector  $Z$  of observed exogenous variables and utilizing  $[Z-E(Z)]\xi_2$  as an instrument, provided that:

$$E(X \xi_1)=0, E(X \xi_2), cov(Z, \xi_1, \xi_2) = 0 \quad (4)$$



and there is some heteroskedasticity in  $\xi_j$ . The vector  $Z$  could be a subset of  $X$  or equal to  $X$ . As  $\xi_2$  is a population parameter, and it cannot be directly observed, we use its sample estimate  $\widehat{\xi}_2$ , obtained from the first stage regression and consequently use the vector  $[Z-E(Z)]\widehat{\xi}_2$  as instruments. This approach is often used in the literature in the absence of external instruments or as robustness checks on findings from 2SLS regressions using external instruments (Awaworyi Churchill & Mishra, 2017; Awaworyi Churchill & Smyth, 2017).

#### 4. Results

Table 2 reports OLS results for the effects of ethnic fractionalization on firm financial performance. Columns 1 to 3 present evidence at the state-level while Columns 4 to 6 present evidence at the district-levels. Further, Columns 1 and 4 present evidence for effects on return on assets, Columns 2 and 5 for effects on net turnover, and Columns 3 and 6 for effects on revenue.

Overall, results suggest a negative association between ethnic fractionalization and firm performance although not consistent across columns. Considering state-level evidence, only the effects of fractionalization on return on assets is statistically significant. Here, a standard deviation increase in fractionalization is associated with a decline of 0.091 standard deviations in return on assets. At the district level, we find evidence of statistically significant negative effects on net turnover and revenue only. Specifically, a standard deviation increase in ethnic fractionalization is associated with declines of 0.057 and 0.065 standard deviations in net turnover and revenue, respectively.

Table 3 presents results that address endogeneity. Panel 1 presents results based on 2SLS regressions which use lag of fractionalization as an external instrument. Panel 2 presents

results for Lewbel 2SLS regressions which combine lag of fractionalization with internally generated instruments while Panel 3 presents Lewbel 2SLS results for internally generated instruments only. Across all panels, the first stage F-statistics shows that the F tests satisfy the Stock and Yogo (2005) criteria as they are above 10. Further, in panels 2 and 3, where we have multiple instruments, we fail to reject the null hypothesis for the overidentifying restriction tests given the p-values. This suggests that the internally generated instruments used in the first-stage regressions are not overidentified.

Results across all panels of Table 3 support the conclusion of a negative effect of fractionalization on firm performance. From Panel 1, only the effects of fractionalization on return on assets are significant. Here, a standard deviation increase in fractionalization is associated with declines of 0.025 and 0.035 standard deviations in return on assets at the state and district-levels, respectively. Results from Panel 2 which are based on both external and internally generated instruments show more consistent effects across the columns. At the state-level, we find that a standard deviation increase in fractionalization is associated with declines of 0.027 and 0.026 standard deviations in return on assets and net turnover, respectively. Similarly, at the district-level, a standard deviation increase in fractionalization is associated with declines of 0.041, 0.034 and 0.023 standard deviations in return on assets, net turnover and revenue, respectively. Findings from Panel 3 are also consistent with statistical significance observed for effects on return on assets and revenue at both the state and district levels. Thus, overall, both OLS and 2SLS results suggest a negative effect of fractionalization on firm financial performance, however, comparing standardized coefficients across both set of results, 2SLS results appear to be relatively smaller in magnitude suggesting an upward bias in OLS results.

Lastly, we examine the robustness of our results to alternative ways of measuring diversity. These results are reported in Table 4. In Panel 1, we examine effects of ethnic polarization. Polarization is also a known measure of diversity but as opposed to fractionalization, polarization is argued to be effective in capturing conflicts (Esteban et al., 1994). In panels 2 and 3, we examine the effects of linguistic fractionalization and religious fractionalization. This allows us to examine diversity along the lines of linguistic and religious differences given the higher correlation between these dimensions and ethnicity as argued in the existing literature (Awaworyi Churchill, 2017b). Overall, results reported across all three panels of Table 4 confirm the existing conclusion of a negative effect on firm performance in India, albeit with varying effect sizes.

## **5. Conclusion and policy implications**

Diversity could be an important ingredient for performance when diversity of skill, cultural values and perspectives, emanating from individual differences could promote innovation relevant for firm growth. On the contrary, diversity could negatively influence social capital, an important ingredient for firm performance. This study thus places firm financial performance in India the context of the levels of diversity in the states and districts in which firms operate. In doing this, we examine the direct effects of ethnic diversity on the performance of 1199 firms in the materials, industrial and information technology sectors. We examine firm performance along the financial dimension and thus focus on return on assets, net sales/turnover, and total revenue as outcomes. Based on indices of fractionalization calculated for 15 states and 74 districts in which these firms operate, we find evidence of negative effects of ethnic diversity on firm financial performance.

These results could be explained by the prevalence of intense ethnic competition between firms, discrimination in employee selection within Indian firms, and the inability to manage diversity (Cooke and Saini, 2010). For instance, Cooke and Saini (2010), suggest that Indian firms face difficulties managing the diversity in their workforce which reflects the level of diversity in Indian communities. Based on evidence drawn from 24 Indian firms of different ownership structures, the authors revealed significant differences in opinion on what diversity means and how it can be managed to harness the positive effects. As discussed in section 2, diversity could lead to either positive or negative effects depending on the channels through which it operates. Accordingly, the appropriate management of diversity is required to ensure that the positive effects of diversity are achieved. Firm, district, and state level policies aimed at appropriately managing diversity are relevant to ensure that the positive effects of diversity are realised.

Further, some studies on organizational behaviour of Indian firms have shown that Indian employees tend to display a mixed set of values and characteristics adapted from both Western and Indian cultures (Birasnav & Rangnekar, 2009; Rai, 2013; Sinha & Kanungo, 1997), and this represents a clash that is introduced because of competing ethnic values, which may not be beneficial to firm performance. While the appropriate management of such competing cultures and values could be beneficial for firm performance, the rapid transition has influenced the ability of firms to manage such complex ethnic differences. It is therefore important to take cognisance of these issues while developing appropriate strategies. Particularly, it is important to take into account the rapid transition of Indian firms from local to global firms with significant influence from western cultures. This suggestion is in line with arguments presented in Budhwar and Debrah (2008) which suggest that organizations

operating with influence from the global stage are likely to face more challenges in managing their workforce given the potential role of cross-cultural differences and the associated diversity.

## References

- Alesina, A., & La Ferrara, E. (2000). Participation in Heterogeneous Communities. *The Quarterly Journal of Economics*, 115(3), 847-904.
- Alesina, A., & Zhuravskaya, E. (2011). Segregation and the Quality of Government in a Cross Section of Countries. *The American Economic Review*, 101(5), 1872-1911. doi:10.2307/23045625
- Anderson, E. W., Fornell, C., & Lehmann, D. R. (1994). Customer satisfaction, market share, and profitability: Findings from Sweden. *The Journal of Marketing*, 53-66.
- Arnold, J. M., Javorcik, B., Lipscomb, M., & Mattoo, A. (2016). Services reform and manufacturing performance: Evidence from India. *The Economic Journal*, 126(590), 1-39.
- Arrow, K. J. (1972). Gifts and Exchanges. *Philosophy & Public Affairs*, 1(4), 343-362.
- Awaworyi Churchill, S. (2017a). Fractionalization, entrepreneurship, and the institutional environment for entrepreneurship. *Small Business Economics*, 48(3), 577-597. doi:10.1007/s11187-016-9796-8
- Awaworyi Churchill, S. (2017b). Microfinance and Ethnic Diversity. *Economic Record*, 93(300), 112-141. doi:10.1111/1475-4932.12310
- Awaworyi Churchill, S. (2018). Firm financial performance in Sub-Saharan Africa: the role of ethnic diversity. *Empirical Economics*. doi:10.1007/s00181-018-1463-2
- Awaworyi Churchill, S., & Mishra, V. (2017). Trust, Social Networks and Subjective Wellbeing in China. *Social Indicators Research*, 132(1), 313-339. doi:10.1007/s11205-015-1220-2
- Awaworyi Churchill, S., Okai, D., & Posso, A. (2016). Internet Use and Ethnic Heterogeneity in a Cross-Section of Countries. *Economic Papers: A journal of applied economics and policy*, 35(1), 59-72. doi:10.1111/1759-3441.12125
- Awaworyi Churchill, S., & Smyth, R. (2017). Ethnic Diversity and Poverty. *World Development*, 95, 285-302. doi:http://doi.org/10.1016/j.worlddev.2017.02.032
- Awaworyi Churchill, S., Valenzuela, M. R., & Sablah, W. (2017). Ethnic diversity and firm performance: Evidence from China's materials and industrial sectors. *Empirical Economics*, 53(4), 1711-1731. doi:10.1007/s00181-016-1174-5
- Bain, J. S. (1956). *Barriers to new competition: their character and consequences in manufacturing industries*. Cambridge, MA: Harvard University Press.
- Becker, G. S. (2010). *The economics of discrimination*. Chicago: University of Chicago Press.
- Birasnav, M., & Rangnekar, S. (2009). Structure of human capital enhancing human resource management practices in India. *International Journal of Business and Management*, 4(5), 226-238.
- Budhwar, P., & Debrah, Y. A. (2008). Future research on human resource management systems in Asia. *Asia Pacific Journal of Management*, 26(2), 197. doi:10.1007/s10490-008-9103-6
- Cooke, F. L., & Saini, D. S. (2010). Diversity management in India: A study of organizations in different ownership forms and industrial sectors. *Human Resource Management*, 49(3), 477-500.
- Dangayach, G., & Deshmukh, S. (2005). Advanced manufacturing technology implementation: Evidence from Indian small and medium enterprises (SMEs). *Journal of Manufacturing Technology Management*, 16(5), 483-496.
- Deng, W.-S., Lin, Y.-C., & Gong, J. (2012). A smooth coefficient quantile regression approach to the social capital-economic growth nexus. *Economic modelling*, 29(2), 185-197.

- Easterly, W., & Levine, R. (1997). Africa's Growth Tragedy: Policies and Ethnic Divisions. *The Quarterly Journal of Economics*, 112(4), 1203-1250.
- Esteban, J.-M., xed, & Ray, D. (1994). On the Measurement of Polarization. *Econometrica*, 62(4), 819-851. doi:10.2307/2951734
- Evanoff, D. D., & Fortier, D. L. (1988). Reevaluation of the structure-conduct-performance paradigm in banking. *Journal of Financial Services Research*, 1(3), 277-294.
- Fafchamps, M. (1998). Market emergence, trust and reputation: Stanford University, Stanford.
- Fafchamps, M. (2000). Ethnicity and credit in African manufacturing. *Journal of Development Economics*, 61(1), 205-235. doi:http://dx.doi.org/10.1016/S0304-3878(99)00068-1
- Forbes, D. P., Borchert, P. S., Zellmer-Bruhn, M. E., & Sapienza, H. J. (2006). Entrepreneurial team formation: An exploration of new member addition. *Entrepreneurship Theory and Practice*, 30(2), 225-248.
- Garnero, A., Kampelmann, S., & Rycx, F. (2016). Is Workforce Diversity Always Performance-enhancing? *Reflète et perspectives de la vie économique*, 55(4), 81-91.
- Ghatak, M., & Guinnane, T. W. (1999). The economics of lending with joint liability: theory and practice. *Journal of Development Economics*, 60(1), 195-228.
- Gisselquist, R. M., Leiderer, S., & Niño-Zarazúa, M. (2016). Ethnic Heterogeneity and Public Goods Provision in Zambia: Evidence of a Subnational "Diversity Dividend". *World Development*, 78, 308-323. doi:https://doi.org/10.1016/j.worlddev.2015.10.018
- Glennerster, R., Miguel, E., & Rothenberg, A. D. (2013). Collective action in diverse Sierra Leone communities. *The Economic Journal*, 123(568), 285-316.
- Gohmann, S. F., Hobbs, B. K., & McCrickard, M. (2008). Economic freedom and service industry growth in the United States. *Entrepreneurship Theory and Practice*, 32(5), 855-874.
- Hall, M., & Weiss, L. (1967). Firm Size and Profitability. *The Review of Economics and Statistics*, 49(3), 319-331. doi:10.2307/1926642
- Hannan, T. H. (1991). Foundations of the structure-conduct-performance paradigm in banking. *Journal of Money, Credit and Banking*, 23(1), 68-84.
- Hansen, G. S., & Wernerfelt, B. (1989). Determinants of firm performance: The relative importance of economic and organizational factors. *Strategic Management Journal*, 10(5), 399-411. doi:doi:10.1002/smj.4250100502
- Hou, K., & Robinson, D. T. (2006). Industry concentration and average stock returns. *The Journal of Finance*, 61(4), 1927-1956.
- Klette, T. J., & Johansen, F. (2000). Accumulation of R&D capital and dynamic firm performance: a not-so-fixed effect model *The Economics and Econometrics of Innovation* (pp. 367-397): Springer.
- Kranton, R. E. (1996). Reciprocal Exchange: A Self-Sustaining System. *The American Economic Review*, 86(4), 830-851.
- Lawrence, D., Diewert, W. E., & Fox, K. J. (2006). The contributions of productivity, price changes and firm size to profitability. *Journal of Productivity Analysis*, 26(1), 1-13.
- Leigh, A. (2006). Trust, inequality and ethnic heterogeneity. *Economic Record*, 82(258), 268-280.
- Lepak, D. P., Takeuchi, R., & Snell, S. A. (2003). Employment flexibility and firm performance: Examining the interaction effects of employment mode, environmental dynamism, and technological intensity. *Journal of Management*, 29(5), 681-703.
- Lewbel, A. (2012). Using Heteroscedasticity to Identify and Estimate Mismeasured and Endogenous Regressor Models. *Journal of Business & Economic Statistics*, 30(1), 67-80. doi:10.1080/07350015.2012.643126
- Majumdar, S. K., & Bhattacharjee, A. (2010). *The Profitability Dynamics of Indian Firms*. Paper presented at the Academy of Management Proceedings.
- McGahan, A. M. (1999). The performance of US corporations: 1981–1994. *The Journal of Industrial Economics*, 47(4), 373-398.
- McMullen, J. S., Bagby, D. R., & Palich, L. E. (2008). Economic freedom and the motivation to engage in entrepreneurial action. *Entrepreneurship Theory and Practice*, 32(5), 875-895.

- Mishra, V., & Smyth, R. (2015). Estimating returns to schooling in urban China using conventional and heteroskedasticity-based instruments. *Economic modelling*, 47, 166-173.
- Montalvo, J. G., & Reynal-Querol, M. (2005). Ethnic polarization, potential conflict, and civil wars. *American Economic Review*, 95(3), 796-816.
- Navon, G. (2010). Human capital spillovers in the workplace: Labor diversity and productivity. *Israel Economic Review*, 8(1), 69-90.
- Parrotta, P., Pozzoli, D., & Pytlikova, M. (2014). Labor diversity and firm productivity. *European Economic Review*, 66, 144-179
- Pelham, A. M., & Wilson, D. T. (1995). A Longitudinal Study of the Impact of Market Structure, Firm Structure, Strategy, and Market Orientation Culture on Dimensions of Small-Firm Performance. *Journal of the Academy of Marketing Science*, 24(1), 27-43. doi:10.1177/009207039602400103
- Rai, S. (2013). Re-thinking workforce diversity in the context of India. *Journal of Strategic Human Resource Management*, 2(2), 1-10.
- Sinha, J. B., & Kanungo, R. N. (1997). Context sensitivity and balancing in Indian organizational behaviour. *International Journal of Psychology*, 32(2), 93-105.
- Sobel, R. S., Dutta, N., & Roy, S. (2010). Does cultural diversity increase the rate of entrepreneurship? *The Review of Austrian Economics*, 23(3), 269-286.
- Stiglitz, J. (1990). Peer Monitoring and Credit Markets. *The World Bank Economic Review*, 4(3), 351-366.
- Stiglitz, J., & Weiss, A. (1990). Credit Rationing in Markets with Imperfect Information. *American economic review*, 71(3), 393-410.
- Stock, J. H., & Yogo, M. (2005). Testing for weak instruments in linear IV regression. In D. Andrews & J. Stock (Eds.), *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg* (pp. 80-105). Cambridge: Cambridge University Press.
- Szirmai, A., & Verspagen, B. (2015). Manufacturing and economic growth in developing countries, 1950–2005. *Structural Change and Economic Dynamics*, 34, 46-59. doi:https://doi.org/10.1016/j.strueco.2015.06.002
- Zhao, H., & Zou, S. (2002). The impact of industry concentration and firm location on export propensity and intensity: An empirical analysis of Chinese manufacturing firms. *Journal of International Marketing*, 10(1), 52-71.

**Table 1. Description and Summary of Variables**

<b>Variable</b>	<b>Description</b>	<b>Mean</b>	<b>SD</b>
<b><i>State-level variables</i></b>			
Fractionalization 1	Index of Ethnic Fractionalization for States	0.185	0.096
Fractionalization 2	Index of Ethnic Fractionalization for Districts	0.133	0.139
Polarization 1	Index of Ethnic Polarization for States	0.165	0.182
Polarization 2	Index of Ethnic Polarization for Districts	0.265	0.277
Linguistic 1	Index of Linguistic Fractionalization for States	0.291	0.159
Linguistic 2	Index of Linguistic Fractionalization for Districts	0.527	0.232
Religious 1	Index of Religious Fractionalization for States	0.252	0.126
Religious 2	Index of Religious Fractionalization for Districts	0.399	0.138
Return on assets	Log of ratio of net turnover or sales to assets	0.371	0.323
Net turnover	Log of net turnover/sales	5.391	1.908
Revenues	Log of total revenue	6.946	2.124
Income 1	Net state domestic income per capita	10.064	0.551
Income 2	Net district domestic income per capita	9.736	0.532
Invested capital	Log of invested capital	5.441	1.847
Assets	Log of total assets	7.262	1.800

Notes: Variables logged except for indices of diversity.



**Table 2. Effects of ethnic fractionalization (OLS regressions)**

VARIABLES	State-level regressions			District-level regressions		
	(1) ROA	(2) Net turnover	(3) Revenue	(4) ROA	(5) Net turnover	(6) Revenue
Fractionalization	-2.035* (1.088) [-0.091]	-1.773 (1.262) [-0.076]	1.219 (1.222) [0.059]	-0.394 (0.337) [-0.026]	-0.904** (0.392) [-0.057]	-0.917** (0.424) [-0.065]
Income	0.658 (0.599) [0.098]	1.168* (0.677) [0.167]	-0.766 (0.648) [-0.124]	0.070 (0.348) [0.010]	1.196*** (0.407) [0.171]	-1.073** (0.440) [-0.174]
Invested capital	0.097*** (0.031) [0.092]	0.052* (0.027) [0.045]	0.260*** (0.028) [0.264]	0.098*** (0.031) [0.092]	0.053* (0.027) [0.045]	0.259*** (0.028) [0.263]
Assets	0.925*** (0.034) [0.827]	1.066*** (0.030) [0.874]	0.705*** (0.028) [0.679]	0.925*** (0.034) [0.826]	1.066*** (0.030) [0.874]	0.706*** (0.028) [0.681]
Constant	-6.210 (5.414)	-13.601** (6.060)	5.649 (5.783)	-0.994 (3.096)	-13.750*** (3.594)	8.248** (3.860)
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,199	1,151	1,198	1,199	1,151	1,198
R-squared	0.833	0.840	0.834	0.833	0.840	0.834

Robust standard errors in parentheses

Standardized coefficients in brackets

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 3. Effects of ethnic fractionalization (2SLS regressions)**

VARIABLES	State-level regressions			District-level regressions		
	(1) ROA	(2) Net turnover	(3) Revenue	(4) ROA	(5) Net turnover	(6) Revenue
<b>Panel 1 – External instrument</b>						
Fractionalization	-0.735** (0.355) [-0.025]	-0.037 (0.341) [-0.001]	-0.189 (0.346) [-0.007]	-0.548** (0.259) [-0.035]	-0.028 (0.256) [-0.002]	-0.141 (0.258) [-0.010]
Observations	1,136	1,090	1,135	1,136	1,090	1,135
R-squared	0.831	0.838	0.833	0.831	0.838	0.833
F-statistics (first stage)	268.34	314.00	427.58	216.76	204.70	216.90
<b>Panel 2 – Lewbel with external and internal instruments</b>						
Fractionalization	-0.802** (0.356) [-0.027]	-0.421** (0.175) [-0.026]	-0.335 (0.337) [-0.012]	-0.655*** (0.215) [-0.041]	-0.562*** (0.175) [-0.034]	-0.327* (0.198) [-0.023]
Observations	1,136	1,090	1,135	1,136	1,090	1,135
R-squared	0.831	0.838	0.833	0.831	0.838	0.833
F-statistics (first stage)	465.07	865.12	267.95	603.19	505.68	542.04
J p-value	0.0618	0.7460	0.0556	0.2174	0.7403	0.0791
<b>Panel 3 – Lewbel with internal instruments</b>						
Fractionalization	-0.562** (0.284) [-0.025]	0.257 (0.254) [0.011]	-0.798*** (0.286) [-0.039]	-0.711*** (0.212) [-0.047]	0.197 (0.196) [0.012]	-0.467** (0.200) [-0.033]
Observations	1,199	1,151	1,198	1,199	1,151	1,198
R-squared	0.831	0.839	0.832	0.832	0.838	0.831
F-statistics (first stage)	137.56	114.72	130.12	149.77	88.35	135.83
J p-value	0.1884	0.4157	0.6052	0.3056	0.5741	0.1226

All regressions control for industry and state dummies

Robust standard errors in parentheses

Standardized coefficients in brackets

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Table 4. Further analysis**

VARIABLES	State-level regressions			District-level regressions		
	(1) ROA	(2) Net turnover	(3) Revenue	(4) ROA	(5) Net turnover	(6) Revenue
<b>Panel 1 – Effects of ethnic polarization</b>						
Polarization	-1.023*	-0.891	0.612	-0.635***	-0.453**	-0.455**
	(0.547)	(0.634)	(0.614)	(0.156)	(0.197)	(0.213)
	[-0.087]	[-0.072]	[0.056]	[-0.063]	[-0.057]	[-0.065]
Observations	1,199	1,151	1,198	1,199	1,151	1,198
R-squared	0.833	0.840	0.834	0.833	0.840	0.834
<b>Panel 2 – Effects of linguistic fractionalization</b>						
Fractionalization	-4.311*	-3.755	2.582	-0.289*	-0.625***	-0.054
	(2.306)	(2.674)	(2.588)	(0.154)	(0.159)	(0.161)
	[-0.224]	[-0.187]	[0.145]	[-0.034]	[-0.070]	[-0.007]
Observations	1,199	1,151	1,198	1,199	1,151	1,198
R-squared	0.833	0.840	0.834	0.833	0.841	0.834
<b>Panel 3 – Effects of religious fractionalization</b>						
Fractionalization	-2.397*	-0.781**	1.436	-0.257	-0.700***	-0.077
	(1.282)	(0.315)	(1.439)	(0.201)	(0.226)	(0.209)
	[-0.121]	[-0.117]	[0.078]	[-0.017]	[-0.045]	[-0.006]
Observations	1,199	1,151	1,198	1,199	1,151	1,198
R-squared	0.833	0.840	0.834	0.833	0.841	0.834

All regressions control for industry and state dummies

Robust standard errors in parentheses

Standardized coefficients in brackets

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**Appendix A1 – List of States Included in Analysis**

Andhra Pradesh	Kerala
Assam	Madhya Pradesh
Bihar	Maharashtra
Chandigarh	Punjab
Haryana	Tamil Nadu
Himachal Pradesh	Uttar Pradesh
Jharkhand	West Bengal
Karnataka	

**Appendix A2 – List of Districts Included in Analysis**

Agra	Indore	Nanded
Allahabad	Jabalpur	Nashik
Aurangabad	Jalandhar	North Cachar Hills
Bangalore	Jalgaon	Palamu
Bardhaman	Jalpaiguri	Patiala
Belgaum	Jaunpur	Patna
Bhandara	Kancheepuram	Pune
Bhopal	Kanpur Nagar	Purbi Singhbhum
Chandigarh	Karnal	Rewari
Chandrapur	Karur	Rohtak
Chennai	Kolhapur	Salem
Coimbatore	Kolkata	Satna
Dewas	Koppal	Solan
Dhar	Krishna	Sonipat
Dharmapuri	Kurnool	Sultanpur
East Nimar	Lucknow	Thane
Ernakulam	Ludhiana	Thoothukkudi
Erode	Madurai	Ujjain
Faridabad	Medak	Varanasi
Gautam Buddha Nagar	Medinipur	Virudhunagar
Ghaziabad	Moga	Visakhapatnam
Guntur	Mumbai	Wardha
Gurgaon	Mumbai (Suburban)	West Godavari
Hisar	Mysore	Yamunanagar
Hyderabad	Nagpur	