

Essays in Development Economics and Political Economy

by
Saugato Datta

B.A., St. Stephen's College, University of Delhi (1998)

M.A., Jesus College, Cambridge University (2000)

M.Phil., University of Cambridge (2001)

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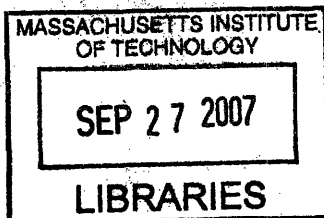
Abhijit Banerjee
Ford International Professor of Economics
Thesis Supervisor

Certified by.....

Esther Duflo
Abdul Latif Jameel Professor of Poverty Alleviation and Development Economics
Thesis Supervisor

Accepted by.....

Peter Temin
Gray II Professor of Economics
Chairman, Departmental Committee on Graduate Studies



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Abstract

This thesis is a collection of three empirical essays on issues in economic development, with a focus on political economy and the labor market in India.

Chapter 1 analyzes the effect of television coverage on political voice by examining the functioning of Question Hour, a forum for political discussion in India's Parliament, which is intended to foster government accountability to the people by allowing Members of Parliament (MPs) to raise questions about issues of concern to the electorate which the Government must answer. I use an unusual source of variation in the telecast status of Question Hour, made possible by the fact that it was only shown on television every other week, to assess what effect television had. I find that MPs did not become more likely to represent the concerns of the voters in their constituency. I argue that the evidence is consistent with party establishments exercising greater control on the participation of their MPs when Question Hour was televised than they otherwise did.

Chapter 2 studies caste and religion in India's new economy sectors - IT (software) and IT-enabled services (call-centers) - by sending fictitious resumes in response to job openings in and around Delhi, India advertised in major city papers and online job sites. We find evidence of discrimination against Other Backward Classes (OBCs) and Scheduled Castes (SCs) in the call-center industry but no corresponding results for these or any other groups (including Muslims) in software jobs. We do however find that having a higher-quality resume helps SC applicants in software jobs the most, and OBCs not at all. We argue that the evidence for SCs is consistent with predictions from theories of statistical discrimination.

Chapter 3 asks whether there is empirical evidence of differential treatment by gender in India's Civil Service by following the careers of 1457 civil servants in India from the time they were recruited to the time they reached the fifth of seven levels within the Civil Service hierarchy. I compile and use a newly-collected data set made up of employment records for all entrants into the Indian Administrative Service, or IAS, between the years 1971 and 1984. Using the individual's rank at entry as a measure of initial quality, I compare the career progress of men and women in each quartile of the rank distribution for each entering cohort, and find that women in the lowest rank quartile take significantly longer than similarly-ranked men (as well as than higher-ranked men and women) to be promoted to level 5 of the civil service hierarchy, which I argue is evidence of statistical discrimination against women in the

Indian civil service.

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Chapter 1

Television Coverage And Political Voice: Evidence from Parliamentary Question Hour in India

Summary 1 *This paper analyzes the effect of television coverage on political voice by examining the functioning Question Hour, an important forum for political discussion in India's Parliament. Question Hour is intended to foster government accountability to the people by allowing Members of Parliament to raise questions about issues of concern to the electorate which the Government must answer. However, it can only fulfil these aims if MPs effectively represent their constituents' concerns. I use an unusual source of variation in the telecast status of Question Hour, made possible by the fact that it was only shown on television every other week, to assess what effect television coverage had. I find that MPs did not become more likely to represent the concerns of the voters in their constituency, and that electoral pressures, which might motivate them to do so, did not explain which MPs participated in the televised discussion. Rather, I find that television increased the voice of nationally prominent politicians and relatively elite, urban voters. I argue that this is consistent with television's comparative advantage for the political establishment lying in its ability to allow politicians or parties to promote themselves to an elite television audience rather than as a means for MPs to appeal to voters in their home constituencies. By looking at the position and progress of MPs' careers within political parties, which play a central role in Indian politics, I argue that the evidence is consistent with party establishments picking prominent members of their party to speak on television. This meant a reduction in the voice of ordinary MPs who did not hold important posts within the government or the party. Because this also happened within*

the ruling party, whose leaders were in fact the Ministers supposedly being held to account, I argue that Question Hour's effectiveness as an institution of accountability may have been hampered by television coverage.

1.1 Introduction

For formal political democracy to be meaningful, it is important that the political discourse be representative of the diversity of voters' viewpoints. Because voters do not participate directly in the debates that inform the framing of policy, the functioning of the institutions through which elected officials represent voters' views and concerns to policymakers crucially affect voters' political voice and thus the potential for government to be accountable to the electorate. While such institutions exist in most countries, their effectiveness depends on elected officials actually using them to represent their voters' concerns, which is likely to be affected by how elected officials' own electoral compulsions, the internal dynamics of the parties they belong to (especially if the party establishment plays an important role in constraining what elected officials can do), and the role of ancillary institutions such as the mass media and civil society. While these questions are of general interest, they may be particularly interesting in the case of developing countries, because a growing body of literature emphasizes the importance of political institutions in the process of economic development. This paper addresses some of these issues by analyzing how India's Parliamentary Question Hour – a key legislative institution through which elected representatives raise issues for discussion in Parliament, the country's highest legislative body – was affected by the introduction of live television coverage.

Question Hour's importance lies in allowing Members of Parliament to raise issues of popular concern to which the government is constitutionally bound to reply, thus holding the government accountable to the people. The following quote from Parliament of India (2005) clarifies its function and importance:

"The Government is ... put on its trial during Question Hour and every Minister whose turn it is to answer questions has to answer for his or his administration's acts of omission and commission. Through Question Hour the Government is able to quickly feel the pulse of the nation and adapt its policies and actions accordingly. It is through questions in Parliament that the Government remains in touch with the people in as much as members are enabled

thereby to ventilate the grievances of the public in matters concerning the administration. Questions enable Ministries to gauge the popular reaction to their policies ... bring to the notice of the Ministers many an abuse which otherwise would have gone unnoticed. Sometimes questions may lead to the appointment of a commission, a court of enquiry or even legislation when matters raised are grave enough to agitate the public mind and are of wide public importance.”

How far Question Hour fulfils its potential as a forum for for elected officials to try to hold the government accountable to the people by expressing the public’s concerns in the political space depends on how it functions in practice. Are MPs able to use, and do they use effectively, their ‘unfettered right’ (Parliament of India, 2005) to represent their constituents and render the government accountable to them during Question Hour? In practice this will depend on the weight that MP’s give voters’ preferences and their own personal concerns (which determines what they want to do), as well as the constraints on what they are able to do during Question Hour - those imposed, for example, by the requirements of MPs’ role not merely as representatives of the electorate in their constituency, but of national political parties which have an image and agenda (which may affect what they are able to do and their freedom to participate in the discussion). If some kinds of MPs are either less willing or less able to participate in Question Hour, it runs the risk of being dominated by a subset of MPs, and this may affect how well Question Hour fulfils its functions. If these MPs privilege certain kinds of issues over others, this may end up leaving some voters, who care about other issues or who are represented by MPs whose voice is not heard, with insufficient voice in the political discourse. If party pressures constrain MPs from voicing issues that may concern their constituents but are not in keeping with the party line, or if Opposition MPs and those within the ruling party who are critical of government policy are unable to participate freely in Question Hour, its effectiveness is diminished. Both individual initiative and institutional constraints may thus affect the actual character and effectiveness of Question Hour.

How might television coverage affect the ability of Question Hour to fulfil its function? It

has been argued in the literature on mass media coverage and political agency that television informs voters about what is being said and done on their behalf and thus increases their ability to use information about the quality of representation they have received to reward or punish politicians electorally, so that the mass media are often considered to aid government accountability (see, for example, Besley and Burgess 2002). If this is true, television may make MPs more attentive to the needs of their constituents, or at least those constituents who have access to it. Much may depend, however, on where television's comparative advantage as a medium of communication for those within the political establishment lies. If, as I will argue is plausible, television's comparative advantage does not lie in directly allowing re-election-motivated MPs to communicate with their voters (perhaps because they have other ways to do this, see Kapur and Mehta 2006) but rather in the ease with which it allows political party establishments or ambitious career politicians to communicate an image or an ideology to a segment of the national audience which they have limited other ways to address, then the effect of television on Question Hour may be to make the latter less, rather than more, effective as a forum for MPs to effectively represent the concerns of voters in their home constituencies. If asking tough questions of the government runs counter to the image-building exercise, Question Hour's effectiveness as a way for the legislature to exercise control over the government may also suffer.

The effect of television on Question Hour's ability to fulfil the role assigned to it is thus an open empirical question. The choices made by the broadcasting authorities in India provide an unusual source of variation in the telecast status of Question Hour which makes it possible for me to directly address these issues. I use the fact that when live television coverage of Question Hour was introduced in India, the proceedings of a particular House (Lower or Upper) were covered only every other week, so that I am able to observe how Question Hour in the directly-elected Lower House of Parliament was different on weeks when it was on television from adjacent weeks when it was not. The alternate-weeks pattern allows me to be more confident that differences I see are related to television coverage than if I were simply

comparing Question Hour before and after the telecast began.

If MPs are using television to communicate with voters in their constituency in order to affect their chances of re-election, then I would expect MPs who represent marginal and/or urban constituencies to be the ones who speak more on television than off. This is because MPs from marginal seats, who are in the greatest danger of being unseated, face the greatest electoral pressure, but because television access in India is a largely urban phenomenon, television is not an effective way to communicate with rural voters. I find no evidence that such MPs are more likely to speak on television than off. Consistent with this, I find that MPs do not make more direct references to the state they represent, and that MPs who represent rural areas become less likely to refer to rural workers and more likely to ask about industrial rehabilitation, which is an urban concern. These results do not, therefore, support the idea that television makes MPs more attentive to the concerns of the people in their constituencies. I find instead that the MPs who speak disproportionately on television are those who have achieved or go on to achieve a measure of prominence in national politics, as measured by their holding Ministerships at some point in their careers. I argue that this is consistent with television being a comparatively efficient way for those within the political establishment to build and maintain a national image among the elite. Consistent with this, questions that refer to foreign policy – something that potentially has greater resonance with the elite – are asked much more often on television than off television.

A possible interpretation of the patterns of participation that I find – where MPs with more successful political careers are more likely to speak on camera – is that these are ambitious MPs, who are using television to project themselves on the national political stage. However, the literature on the Indian political system emphasizes the role of parties and the control they exercise over politicians' careers. Thus, an equally plausible explanation is that parties choose certain MPs to represent them on television because of its effectiveness as a medium to build party image. I analyze these issues further by looking more closely at the careers of individual MPs within the three largest political parties in Parliament.

I am able to identify those who were established party leaders, those who were not yet prominent but would become prominent later, and backbenchers/ordinary MPs. For the Congress Party, the results point towards established party leaders being the ones who speak much more on television and backbenchers being pushed off camera. This is much more consistent with the view that the party establishment decides whom to promote on television (in this case, itself) than with a model of individual MPs seeking national prominence through television. The results for the other two parties are more ambiguous, but in no case can I rule out the influence of the party or its dominant faction. My interpretation of this is that television makes party establishments more concerned about controlling internal dissent than they were when Question Hour was an institution internal to Parliament, and in so doing, ensures that certain kinds of voices from within parties are heard less on television. That this happens within the ruling party is particularly problematic for an institution that is meant to hold the government accountable to the public, because ruling-party frontbenchers *are* the government, and any criticism of government policy and actions from within the ruling party cannot reasonably be expected to come from them. While it is unclear to what extent there was ever scope for internal dissent to be aired through Question Hour (the fact that the party establishment was able to crowd out backbenchers suggests that backbenchers may have been quite docile to begin with), television seems to have reduced what scope there may have been, and made Question Hour potentially even less of an institution of executive accountability than it already was in a political system where the lack of legislative oversight over the executive is of considerable concern to scholars (see Kapur and Mehta 2006; Rubinoff 1996).

My conclusions are therefore that by virtue of what it could most effectively accomplish for the political establishment – a rapport with the urban elite – television coverage of Question Hour made it function less as a forum where individual MPs raised issues of concern to the voters in the constituencies they represented, and more a space for political parties to establish their image and agenda in the mind of the television-watching elite in India. In the

process, rural workers found their voice in Parliamentary discussion reduced, and Question Hour became less the domain of the ordinary MP and more that of the political insiders who already held public office.

1.2 Background

This section provides background on the Indian political system as of the period being studied in this paper, the role of Question Hour in India's Parliament, and the live television coverage of Question Hour, and describes the data used. This is useful in motivating the exact ways in which I attempt to measure the impact of television on Question Hour

1.2.1 The Indian Political System

India is a Westminster-style Parliamentary democracy with a bicameral Parliament. The Lower House (the Lok Sabha, or the Council of the People) is made up of upto 543 members, known as Members of Parliament (MPs), 541 of whom are elected by universal adult franchise and a first-past-the-post electoral system to represent a single-member electoral constituency¹. While 411 seats can be contested by people of any caste background, 81 seats are reserved for members of the Scheduled Castes, and 43 for members of the Scheduled Tribes, as part of constitutionally-mandated measures of affirmative action for historically-disadvantaged groups. The Upper House (Rajya Sabha, or Council of States) is not directly elected but nominated by state (regional) governments. Indian elections tend to be marked by high turnout and vigorous contests, with a large fraction of seats being won by small margins and anti-incumbent bias (see Linden 2004; Cole 2004).

Political parties play a central role in Indian democracy (see Chhibber 1999), since most aspects of politicians' political careers – from getting nominated to eventually being able to aspire to high political office – operate within the purview of the party, the principal political institutions through which political power in India is channeled. Some politicians nonetheless

¹Two members may be nominated by the President of India to represent the Anglo-Indian community if it is felt that the latter are not adequately represented.

manage to have careers independent of particular parties – defection is not uncommon, and neither is leaving an established party to form one’s own – but in general the party looms large in most politicians’ lives and careers, so that the party establishment, and the need to keep it happy, may motivate some of what elected officials do. Some background about the main parties in Indian politics follows.

For much of the period since Independence in 1947, Indian politics was dominated by a single party, the Indian National Congress (INC), which had led the movement for independence from Britain, and ruled uninterrupted from 1947 to 1977, and then from 1980 to 1989. Since then, no single party has managed to get a working majority, so that national politics is now dominated by coalitions, usually with one dominant partner from the two biggest parties, the INC and the Hindu-nationalist Bharatiya Janata Party (BJP), and several smaller partners, usually regional/caste-based parties.

This paper covers two years – 1994 and 1995 – in the life of the Xth Lok Sabha, which was put in place after the General Elections of 1991², and served out its full five-year term. The national parties with the largest representation were the INC (which was the ruling party with outside support from different parties at different points during its term, since it did not command a clear majority by itself), the BJP (the main opposition), and the centre-left/lower-caste Janata Dal and the Communist parties: between them, these parties account for 477 of the 537 seats in the Lok Sabha. Most of the rest of the seats are held by regional parties. Women have historically been under-represented in Indian politics, and held 7.2 per cent of the seats. As would be expected from a system where parties play a major role, there was only one Independent in the Xth Lok Sabha.

1.2.2 Question Hour

Parliamentary Question Hour in India is modelled on the British Parliamentary practice of Question Time with some procedural variations. During Question Hour, which is held

²Elections could not be held in Punjab till 1992 due to ongoing political unrest, and were not held in Jammu & Kashmir at all for the same reason, so that the total strength of the Lok Sabha was 537.

every morning when Parliament is in session, Members of Parliament from all parties pose questions to the government, which it answers through its Ministers. Question Hour is thus an institution that allows MPs, in their role as elected representatives of the people, to bring matters that concern voters to the government's notice and to demand explanations and clarifications from the government, thus holding the government accountable to the people. Understanding how television affects its functioning in this manner is the goal of this paper.

The procedure for asking questions is summed up in the Lok Sabha Handbook (Lok Sabha 2001). Questions may be submitted by any MP who wishes to raise a question, including members of the ruling Party or coalition. The MP submitting the question must provide the text of the question in the prescribed format, specifying the name and designation of the Minister from whom an answer is sought, the date when the MP wishes the question to be tabled, and whether s/he wishes the question to be listed for oral answer (indicated by a star against the question, hence the term 'starred question' or whether a written answer is sought). Questions are to be submitted to the office of the Speaker, who conducts Question Hour, at least a week in advance. If the question is found to have been submitted in the prescribed format, it is entered into the ballot to determine the order in which it is to be called³. On the designated date, the Speaker calls upon the MP who then addresses the question to the Minister concerned. Two supplementary questions may to be asked based on the Minister's answer, and if the issues raised merit further discussion, then the Speaker may allow a separate Half-Hour discussion outside of Question Hour.

Given that the literature on the Indian political system stresses the centrality of parties to political life in India, it is natural to wonder how far MPs behave autonomously in deciding when to ask a question and what to ask. In practice, it may well be that party establishments or leaders exercise at least some control over what MPs say in Parliament. On the other hand,

³If the order is truly random, then this may determine which starred questions actually get discussed on television and which were intended to but did not, because the discussion on early-listed questions often runs over so that questions listed with higher ballot numbers do not always get discussed orally. In subsequent work, I hope to use this to see whether questions that are actually heard on television are more likely to be acted upon than the rest.

discussions with an experienced MP suggest that MPs are keen to use what opportunities they have to raise issues that they want discussed, and Question Hour is one of the key parts of Parliamentary procedure that allows them to do this. Participation in Question Hour is thus likely a balance of individual initiative and party strategy. How this balance is affected by television coverage may be informative about where the comparative advantage of television for the political establishment lies.

1.2.3 Access to Television in India

Television transmission in India began in 1959, but was initially restricted to the capital, New Delhi. In 1982, television coverage began to be expanded and low-powered transmitters were set up to expand the reach of television programming, and by 1990, 90 per cent of the population lived in an area within the reach of television signals, so that signal availability had ceased to be a constraint in India by the period this paper studies. However, television ownership (and, consequently, viewership) in India continues to be low and overwhelmingly urban. The 2001 Census was the first to collect data on television ownership and found that 31.4 per cent of Indian households owned a television set. This masks sharp disparities between rural and urban households: among the latter, ownership is 64.3 per cent, but only 18.9 per cent of rural households own a television. Estimates from the National Readership Survey 2001 paint a similar picture vis-a-vis the rural-urban disparity in television ownership, though the absolute estimates of television ownership are higher in both cases (28.5 percent for rural households and 79.4 per cent of urban households) than the corresponding Census estimate. Thus, even as of 2001, less than one in five rural households in India owned a television set. Although viewership could theoretically be higher due to sharing of sets, Malik(1989) points out that 'erratic power supply and ...community sets that did not function'(Malik 1989) suggest that this is unlikely to have been the case.

After 1991, satellite television began to be available to viewers as an alternative to state-run television, but penetration and viewership was low: the estimated number of households

that had cable by 1994 was 7.28 million, only about a quarter of the total urban television households. The limited viewership data that are available are restricted to the metropolitan cities, but these underscore the continued dominance of Doordashan, the state telecaster, even in the areas where cable television had made the most headway: data from an IMRB viewership survey quoted by Rao(1998) found that the audience share of Doordarshan was between 75 per cent and 95 per cent in 1996. Doordarshan continued to 'enjoy a much larger share of viewers by virtue of its terrestrial transmission network' (Melkote et al. 1998). Thus, as of the time period covered in this paper, the television audience in India was primarily urban, and the majority of television households in the country were still receiving only Doordarshan's national channel. Some anecdotal evidence (see CMS 2006) about what Indian television covers also suggests that rural/agricultural issues occupy a small share of television newstime (though this is hard to interpret in the absence of information about what the optimal share of such news items is).

1.3 Empirical Strategy: Using the Alternate-Week Coverage of Question Hour

Question Hour is held simultaneously in the Lok Sabha and the Rajya Sabha. However, at the time that the decision to show the proceedings of Parliament live on national television was taken in December 1994, India had only one national television channel. In order to provide coverage to the Question Hours of both Houses of Parliament, the proceedings of a particular Hour (Upper or Lower) were telecast live only every other week. Thus, adjacent weeks differ in terms of their status vis-a-vis television coverage. This allows for a research design which is an improvement over a simple comparison of the behavior of MPs before and after the introduction of television into Parliament, as is clear from the following example.

Imagine that we saw more attention to drought relief programs after Parliamentary proceedings began to be telecast live. It would be difficult to attribute this to the media coverage, because drought relief may simply have become more salient in the year after the telecast

(perhaps because there was a drought). The alternation in the telecast status, however, deals with this objection to a large extent, because a similar problem would now arise only if the importance of drought relief programs were to vary substantially and systematically from one week to the next. It seems much more reasonable to assume that 'other factors' that determine the importance of an issue or group of agents in the economy is unchanged from one week to the next than from one year to the next. A similar argument can be made for patterns of participation: given an MP's intrinsic interest in participating during Question Hour, this interest is likely to be fairly stable from week to week, so that the effect of television on participation can again be identified using the alternate weeks pattern.

Communication with officials at Doordarshan, India's national telecaster, revealed that the Lok Sabha Question Hour was telecast on the second, fourth, etc. weeks of each session beginning with the Winter Session of 1994⁴. This allowed each date that appears in the dataset to be assigned a dummy for whether the Lok Sabha proceedings were being shown on television on that day or not. This dummy, which is called *EvenWeek*, takes the value 1 for all even-numbered weeks in each of the 6 sessions of the Lok Sabha that my data covers. However, we might worry that even-numbered weeks are somehow different from odd-numbered weeks. To control for this, I difference out the difference between even- and odd-numbered weeks in the pre-telecast data (Budget and Monsoon sessions, 1994). My measure of the effect of television is then

$$(\textit{EvenWeek} - \textit{OddWeek})_{\textit{post-telecast}} - (\textit{EvenWeek} - \textit{OddWeek})_{\textit{pre-telecast}}$$

In a regression framework, the baseline specification takes the following form:

$$y_i = \alpha + \beta \cdot \textit{EvenWeek} + \gamma \textit{PostTelecast} + \delta \textit{PostTelecast} * \textit{EvenWeek} + \varepsilon_i \quad (1.1)$$

⁴In a given calendar year, the Lok Sabha usually meets for three sessions: the Budget Session (in March-April), the Monsoon Session (in July-August), both of which run for around two months, and the shorter Winter Session (which runs for about a month). My data is from the Budget, Monsoon and Winter Sessions of 1994 and 1995.

The coefficient of interest is δ , the difference-in-differences estimate of the effect of television. A positive and significant value means that the kind of question measured by the dependent variable was significantly more likely to be asked in weeks when television was showing Question Hour, or that the kind of person measured by the dependent variable was more likely to ask a question on-camera. Note that the coefficient γ conflates the time effect with any potential spillovers from telecast to non telecast weeks; though it would be useful to separate these components, it is unfortunately not possible to do so.

1.4 Data and Variables

In this paper, I analyze starred, or oral, questions since these are the ones which MPs submit for actual discussion during Question Hour (and therefore the ones which television coverage might be expected to affect). To do so, I constructed a complete record of all questions asked in the Lok Sabha during Question Hour in the calendar years 1994 and 1995 from the searchable archive of questions on the website of the Indian Parliament (<http://parliamentofindia.nic.in>). The record for each question provides the name of the questioner, the ministry to which the question was addressed, the date the question was asked, a summary of the content of the question. I supplement the data with information about the MP's party affiliation, whether the seat the MP represented was reserved or open-contest, and the MP's gender from the biographical sketches available on the Lok Sabha website. Table 1 presents summary statistics about the questions in the dataset, broken down by whether they were asked before the live television coverage began or on-camera after the telecast began.

As discussed above, the disparities between rural and urban India in access to television are stark. This suggests that the rural-urban cleavage may be useful in identifying which voters television can potentially reach, and who it cannot. To distinguish MPs who represent primarily rural areas from those whose constituency is primarily urban, I use Census data on the rural-urban population breakup of all administrative districts in India. Using this

and a mapping of Parliamentary constituencies to administrative districts, I am able to measure what percentage of the population of a Parliamentary constituency is urban. About 23 per cent of India's population lived in urban areas as per the 2001 Census, but the urban population is concentrated in a relatively few districts (57 of the 592 administrative districts are urban-majority). I call a constituency urban (and an MP who represents such a constituency an 'urban MP') if at least 50 per cent of the population in the district(s) where the constituency is located is urban.

I also supplement the data with the margin of victory for each constituency (all from Election Commission of India 1991, 1992), as a measure of the degree of electoral pressure on the MP. Finally, to be able to gauge the MP's place within his or her party and the success of his/her national political career, I supplement the data with information about the MP's past, current and future political career, namely whether or not the MP was ever a Minister in the Central Government.

The question summaries in the dataset were coded along several dimensions to enable them to be analysed empirically. To look for direct links to constituencies, I recorded all references to states and administrative districts. I also recorded a question as referring to a particular state and district if it was about something located in that state and district: for example, if it named a plant of a public-sector unit, I recorded it as referring to the district (and state) where the factory in question was located. I then used maps to generate a correspondence between administrative districts and Parliamentary constituencies (while most Parliamentary constituencies were originally drawn up to correspond to districts, repeated district re-organization and constituency delimiting has meant that by the 1990s, district borders sometimes deviate from constituency limits). This allowed me to generate variables that measured whether a question referred to the state/district in which the constituency that the MP asking it lay. I also recorded references to groups of actors of any kind - whether occupational groups (e.g. farmers, industrial workers, entrepreneurs, government employees), industries (e.g. village industries, the sugar industry, etc.), social or ethnic groups (e.g.

scheduled castes, tribes, religious minorities, women, etc.). I use this later to group questions into those that refer to agents who belong to particular sectors (rural, urban, industrial, agricultural) of the economy. The topics covered by the question were also noted.

Finally, I classified questions into those that asked about the progress of a government project or scheme, those that related to government expenditure, and those that specifically asked about allocations in cash or kind to a state or states, in order to try and assess directly whether some questions were more directly fulfilling the purpose of holding the government accountable for its actions. Ideally, I would have liked to classify whether or not a question was critical of the government, but this proved impossible to do without the full verbatim record of proceedings, to which I do not have access. In practice, therefore, my classification picks up at best whether a question asked about some specific aspect of the government's actions without getting at whether it is critical of the government (e.g. by asking about a project which the government has failed to complete), or what in British Parliamentary practice is called a 'Dorothy Dixer' - a question that gives the government a chance to promote its accomplishments (House of Commons Information Office 2005) .

1.5 Analysing the Effects of Television Coverage on Question Hour

This section synthesizes the insights from the preceding sections to motivate the precise questions which I will try to answer empirically.

1.5.1 Participation Patterns

What the effect of television coverage on Question Hour is depends on where its comparative advantage lies as a medium of communication for those in Parliament. The information about the patterns of television access in 2.3 above suggests that if the ability to communicate with constituents with a view to influencing their voting decisions in future elections is what is behind the observed patterns of participation in Question Hour on weeks with television

versus weeks without, then MPs who represent closely-contested seats in urban areas should be the ones most keen to speak on television.

On the other hand, television's comparative advantage may lie in the ease with which it allows ambitious politicians or political parties to communicate an image or an ideology to a national audience which they have limited other ways to address. Unlike India today, where a multitude of channels provide many outlets for politicians to make themselves heard, India in the mid-1990s was a one-channel country. In addition, the fact that many other technologies for directly appealing to voters (rallies, door-to-door campaigning, etc.) exist and can be used at election time strengthen the idea that the live telecast's comparative advantage lies in this sort of image-building with the elite, rather than individual MPs relying on it to communicate with a home-constituency electorate. This view of the benefits of television for the political establishment suggest that measures of the status of MPs within the political and party hierarchy may influence who speaks on television.

1.5.2 Question Content and Constituency Characteristics

Question content can also be used to address these issues. To identify questions that address issues linked to different groups among the electorate, I use the variable in the dataset that notes the various groups that are referred to in questions asked by MPs. Using the references noted under this variable, I construct a new dummy variable `RuralWorker`, which takes the value 1 if the question refers to a group of agents who are primarily rural. In effect, this is a variable that captures references to people who work in some capacity or the other in the rural economy - farmers, agricultural laborers, fishermen, village industry workers, etc and is thus a measure of questions that are linked directly to the concerns of voters who work in the rural economy. Since rural MPs are less able to reach their constituents using television, their propensity to ask questions about rural voters should not increase if communicating with voters is the goal of their on-television speeches, though there is no reason for them to speak less about such issues to the extent that they speak at all. However, if rural MPs participate

in their party's image-building strategy, then they may actually become less attentive to rural voters' concerns when they speak on television. Looking at rural MPs' propensity to ask questions about rural issues is therefore another way to get at the issue of what television time on Question Hour is being used for.

Just as agricultural workers are mostly rural, industrial workers are mostly urban. However, there are negligibly few direct references to workers in the industrial sector, making it impossible to generate a variable that is the exact counterpart of `RuralWorker`. The closest equivalent is the variable I call `DepressedIndustry`, which refers to depressed industries. These questions are largely about industrial revival or rehabilitation, issues that are linked directly to workers in the urban industrial sector (In India most depressed industries are located in urban areas, since they tend to be concentrated in areas which saw the first wave of industrialization and have subsequently seen declines in competitiveness). In what follows, I use `DepressedIndustry` to capture questions which are linked to urban industrial workers. Such voters may be among the television audience, and can thus be profitably targeted by television speeches. Again, the nature of the MP's constituency can provide useful information: if rural MPs become more likely to ask these sorts of questions, then this suggests once again that they are not using their television time to speak directly to the median voter in their home constituency.

I also see whether certain topics gain (or decline) in prominence when television cameras are present. If the political establishment is using television coverage to generate an image for itself, this should be reflected in the sorts of topics that are discussed more on television than off.

1.6 Results

1.6.1 What Kinds of MPs/Issues Tend to Be Heard More On Television?

Table 1.2 presents results about what sorts of MPs were disproportionately likely to speak on television than off. Column 1 shows that MPs who represent marginal seats do not

ask significantly more questions on television than off. Column 2 shows that the same is true of urban MPs, and column 3 checks if urban MPs whose seats were closely contested are more likely to speak on-camera than off, and finds that they are not. Column 4 uses *NationallyProminent*, a measure of whether the MP was or ever became a Minister in the Central Government, and find that such MPs tended to ask a disproportionate number of questions on television. Overall, therefore, the results about the kinds of MPs who are more likely to speak on television than off suggests that the 'image building' view (whether that image is of the party or of an individual MP) of the uses of television may be closer to the truth than the 'communicating with voters in the home constituency' view. This has interesting implications for how we think about parties and individual MPs responding to the introduction of television coverage, which I discuss in Section 1.6.3. Finally, Column 5 shows that questions about a potentially elite concern , foreign relations, are disproportionately likely to be asked on television.

1.6.2 Do MPs Speak More About Own-Constituency Voters and Issues on TV?

The results above about what differentiates those who speak on television from those who prefer to speak in the absence of television does not support the idea of MPs using Question Hour to directly address the voters in their constituency. Here, I attempt to measure this directly in a number of ways, using the content of questions and the nature of MPs' constituencies. Table 1.3 presents the results. Column 1 uses the mapping from questions to states, districts and constituencies described in Section 1.5 above. MPs are not more likely to refer to their own state on-camera than off. Results for the propensity of MPs to ask questions about their own district cannot be reported because such references are negligibly few: 7 in total, 3 pre-telecast and 4-post-telecast (of which 3 occur on-camera and 1 off-camera). Column 2 reports the results of regressions using *RuralWorker* as the dependent variable in (1). The coefficient of interest is negative and significant; questions relating to rural voters are significantly less likely to be asked on-television than off-television. Rural

MPs ask 88.2 per cent of all questions about rural voters, so that it must be the case that the results in Column 2 must be driven at least in part by rural MPs' asking more of these questions off-camera than on-camera. To confirm this, Column 3 repeats the regressions in Column 2, but restricts the sample of questions to those asked by rural MPs. The results indicate that even when we consider only the questions that rural MPs ask, the probability that a question refers to rural voters is significantly lower on on-television weeks compared to off-television weeks. Column 4 reports the results of regressions using `DepressedIndustry` as the dependent variable in (1). These questions, which relate to workers in the industrial sector which in India is mainly urban, are significantly more likely to be asked on-television than off-television. Column 5 repeats the regressions in Column 4, but restricts the sample of questions to those asked by rural MPs, to see whether rural MPs, who ask fewer questions about rural voters (see above), also ask more questions about urban issues. The results indicate that this is the case: rural MPs are more likely to ask questions about what is essentially an urban issue on-camera than off-camera. Seen together, these results do not support the idea that television makes MPs more responsive to concerns of voters in their home districts, which accords with the results in the previous sub-section about which types of MPs were seen disproportionately on television.

1.6.3 What Can We Infer About Party Strategies and Individual Ambition From Participation Patterns?

The positive result from Table 1.2 suggested that either personal ambition or party strategies or a mixture of the two were the main factors determining which MP's spoke on television. Distinguishing between what is plausibly party-establishment-driven, and what is driven by individual initiative, is difficult, but may help us to understand how Question Hour functions in practice. As I argued earlier, the ability of the discussion during Question Hour to fulfil its functions depends on how freely MPs of all kinds are able to participate in it, and given the centrality of parties to political life in India, it may well be that party establishments/leaders exercise at least some control over what MPs say in Parliament. It is therefore possible that

party pressures may constrain MPs from raising issues that may concern their constituents but are not in keeping with the party line or image. I will argue here that looking more closely at the career paths of MP's within the political establishment may allow us to proceed part of the way towards understanding these issues. Doing so, however, will require moving beyond the simple measure of political prominence I have used in Table 1.3.

NationallyProminent is a good measure of lifetime political prominence, but it is not very clear about what the trajectory of the MP's career. Including as it does both MPs who were already prominent and those who rose to prominence in periods after television, it makes it difficult to distinguish between different explanations of what the result that 'prominent' MPs are disproportionately likely to be seen on television means. Consider MPs who were not yet prominent on the national political stage but became Ministers in later cabinets. The finding that these MPs spoke disproportionately on camera could mean several things. One possibility is that these MPs were intrinsically ambitious, and therefore embraced the opportunity to speak on television as an aid to building their political careers. However, it would be impossible to rule out that some part of their eventual political success may be because they spoke on television, so that NationallyProminent is not strictly speaking a measure of intrinsic ambition, but is mixed up with a possible 'television treatment effect'. Further, if it is possible that the wishes of the party establishment and not just individual initiative are driving who speaks when, then the result about prominence may just mean that those who are picked by the party to represent it on television are eventually made Ministers, so that a desire to build a personal reputation or gain personal prominence has little to do with what we observe. On the other hand, if MPs who are already prominent are driving the results presented earlier, it seems less likely that this is due to a desire to ascend the political ladder, since these MPs have already achieved success in their political careers. It may then be that parties believe that it is important to be represented by well-established faces on television. In any case, looking more closely at MPs' careers within parties is useful.

I carry out this exercise separately for MPs belonging to the three largest parties in the

Xth Lok Sabha (the INC, the BJP and the Janata Dal), in order to allow me to spot any differences between parties. For each MP from these parties who speaks during Question Hour, I enter detailed information about whether the MP in question was prominent before the 1991 elections (previously prominent), during the period under study (1991-96), and after 1996 (future prominent), where prominence is measured by the MP having held a post such as a Ministership, Party Whip, or Membership of the party's highest decision-making body. This allows me to classify MPs into several categories, based on their career trajectories. I define 'party leaders' as those who were prominent before and during the Xth Lok Sabha. Conversely, an MP is a rising star if he only became prominent after 1996, so that he did not hold a party or government post during the time the paper studies. Information about whether the MP was ever re-elected allows me to classify some people as those whose careers seem to have ended. I classify as backbenchers those who never held a position of prominence.

Table 1.4 presents results for the Congress Party. As the results show, it is established party leaders who speak disproportionately more when television covers Question Hour (Column 1), and backbenchers who lose out (Column 2). There is no evidence that those who will become prominent in the future are more likely to speak on television (Column 3). Much more than behavior driven by ambitious MPs' desire to gain national prominence by being seen on television, these results suggest that the most plausible explanation for what is happening, at least within the Congress Party, is the voice of the party becoming much more dominated by the voice of the 'establishment' MP - someone who is already well-established, and perhaps more comfortable toeing the party line, at the expense of 'ordinary' MPs. The voice of figures who already hold high public office through the party appear to gain greater prominence within the party due to television. In this respect, it is interesting that Chhibber (1999), writing about the Congress party organization, notes that the party 'became subservient to the executive' (1999:68) and that 'there is little doubt that at the national and state levels Congress in the 1990s is mostly the preserve of a few individuals' (Chhibber 1999:73). He also notes that the Congress is extremely undemocratic internally: organizational elections

within the Congress were no longer held beginning 1972. Overall, the picture he paints is of a party that is a collection of fiefdoms of various leaders, who 'employed the power and patronage associated with executive office to control party organization and control dissidence within it'. The Congress' response to the introduction of television to Question Hour could be described in somewhat similar terms.

Table 1.5 presents results for the BJP. Here, as Columns 1-3 show, it is the MPs who are yet to attain prominence but who do so in the future whose voice is amplified by television. While it is certainly not the case, unlike with the INC, that the established leadership of the party speaks disproportionately often on television, it is also true that the BJP, a younger party which had never been in power at the Centre at this point, perhaps had fewer people who my method of coding prominence would recognise as leaders. In that sense, the results for the BJP could be consistent with any of the explanations discussed above: ambition, being pushed by the party as an 'anointed' leader, with television treatment effects mixed in.

Table 1.6 presents results for the Janata Dal, one of the new lower-caste-based parties that emerged in North India in the late 1980s, as part of a pattern that Chhibber refers to as the replacement of a catch-all party system with one based on social cleavages. As Columns 1 and 2 show, neither being a leader, nor someone who was up-and-coming, can explain who among the Janata Dal MPs speaks on television, and backbenchers speak less on camera though the coefficient is only marginally significant. Column 4 shows, however, that people who currently do not hold a party or government position, but who have in the past and will in the future (Current Low), speak much less on camera than off camera: in the case of other parties, people's careers did not seem to ever follow this sort of trajectory. This may seem puzzling until one notices the precise identity of the two very prolific participants in Question Hour who make up the CurrentLow category. Both these MPs - Ram Vilas Paswan and Nitish Kumar - subsequently left the Janata Dal to form their own parties, and have held prominent positions in government ever since. While there is no way for me to be certain about this, these results are indicative of the pressures facing a party deeply ridden

by factionalism, and reflect either the success of the dominant faction in the party to prevent MPs whose party loyalties were suspect from speaking on behalf of the party on television or the disinclination of an MP who is disenchanted with the party he currently represents to be publicly identified with it.

I interpret these results to mean that whatever the pre-existing degree of control that party establishments may have exercised over their MPs, they became more concerned with projecting their image, and as a corollary, more concerned about controlling internal dissent than they were when Question Hour was an institution internal to Parliament. The manifestation of this in terms of the participation patterns that I see is that certain kinds of voices from within parties are heard less on television: backbenchers, 'ordinary' MPs, and those out of favor with the party establishment. Should this concern us? The literature on legislative oversight over the executive in general and on the functioning of the institutions of Parliamentary democracy in India in particular suggest that what I find happening within the Congress party is particularly problematic for an institution that is meant to hold the government accountable to the public (see Kapur and Mehta 2006; Rubinoff 1996; Lyskey 1970). This is because those whom my data recognises as current leaders of the Congress party are, by virtue of their party being in power, actually Ministers in the Government. What this means is that what we are seeing is that television is leading to a greater tendency than would otherwise have been the case for government Ministers to ask each other questions, thus defeating the purpose of Question Hour as a mechanism of government accountability: open criticism of government policy and actions from within the ruling party, to the extent that it exists at all, cannot be expected to come from the very people responsible for these policies. This is presumably the reason that in its original form in British Parliamentary practice, Ministers cannot ask questions during Question Time: only the Opposition and backbenchers can. Of course, the fact that the party establishment was able to crowd out backbenchers suggests that backbenchers may have been quite docile to begin with, so that perhaps there was never any scope for internally-dissenting opinions or inconvenient issues

to be aired through Question Hour. It may well be, however, that the party establishment always had the power it seems to exercise when television covers Question Hour, but was more lax about enforcing this power when the only audience for Question Hour was other MPs, because internal discipline and being 'on-message' was less crucial. It is thus possible that Question Hour was actually a freer forum for the expression of diverse opinions - or at least the opinions of those outside government - in the absence of television coverage. If this is true, then television could have made Question Hour less effective as a way for MPs to exercise oversight over the activities of the government. To try and address this question directly, Table 1.7 presents regressions that use the classification of questions into those that asked about the progress of something the government was doing (a project, scheme, etc), those that related to government expenditure, and those that specifically asked about allocations in cash or kind to a state or states, in order to try and assess directly whether some questions were more directly fulfilling the purpose of holding the government accountable for its actions. The results are ambiguous, because while it does seem that more questions about the progress of government projects/schemes were asked on television, this is not true for the other ways in which I tried to measure the 'substantiveness' of questions. This highlights, more than anything, the difficulty of knowing from the question summaries I am working with whether a question truly tested the government, or merely sounded 'detailed' but was actually a softball question that gave the Minister a chance to boast about the government's achievements. It is, of course, possible that what sounds like a more substantive question simply sounds more impressive, and that all parties want their speakers to appear more competent in front of the more elite television audience.

1.7 Conclusion

Question Hour's rationale is to provide Members of Parliament with a forum where they can raise questions about the government's actions, policies, and plans which the government is legally bound to reply to, thus holding the government accountable to the electorate by

raising issues of concern to voters. In the absence of information about what voters want, it is not possible to measure how well Question Hour ever fulfilled this function, but this paper provides evidence that the changes in participation and the content of discussion brought about when television began to cover Question Hour point in the direction of its becoming less, rather than more, of an open forum for MPs of all kinds to voice issues that concerned their constituents. Rather, the most likely interpretation of the changes we observe is that the presence of television cameras increased Question Hour's viability as a forum through which parties could communicate their image and agenda to an elite, urban audience. In the process, Question Hour became much less the preserve of the ordinary MPs and backbenchers, and much more the domain of MPs who held public office and were party and political insiders. Consistent with this, elite concerns such as foreign policy edged out the concerns of the rural workforce, and there was no evidence that television served to make MPs more responsive to the voters who they represented.

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Table 1.1: Participation in Question Hour: Summary Statistics

Type of MP	No. of MPs	% of Total	Questions Pre-telecast	% of Total	Questions On TV		Questions Off TV Post-	
					Post- telecast	% of Total	telecast	% of Total
INC	158	41.1	586	31.3	388	30.2	373	27.6
BJP	95	24.7	547	29.3	437	34.0	453	33.6
JD	46	12.0	317	17.0	176	13.7	204	15.1
CPI(M)	30	7.8	106	5.7	58	4.5	85	6.3
CPI	13	3.4	45	2.4	36	2.8	56	4.1
TDP	11	2.9	145	7.8	84	6.5	79	5.9
AIADMK	8	2.1	12	0.6	12	0.9	9	0.7
Urban	47	12.2	245	13.1	194	15.1	189	14.0
Rural	337	87.8	1625	86.9	1092	84.9	1161	86.0
Marginal	101	26.3	562	30.1	373	29.0	397	29.4
Prominent	86	22.4	454	24.3	350	27.2	302	22.4
SC	47	12.2	224	12.0	150	11.7	172	12.7
Women	27	7.0	164	8.8	121	9.4	104	7.7
Total	384	100	1870	100	1286	100	1350	100.0

Based on all starred questions, and MPs who asked them, during 1994 and 1995

Table 1.2: MP/ Question Characteristics On and Off-Television

<u>DepVar:</u>	<u>Marginal Seat</u>	<u>Urban MP</u>	<u>Urban Marginal</u>	<u>NationallyProminent</u>	<u>Foreign Relations</u>
<i>alt_post</i>	-0.021 0.027	0.0245 (0.0209)	-0.0045 (0.0132)	0.0554** (0.0261)	0.019** (0.0079)
<i>altweeks</i>	0.0169 (0.0212)	-0.0066 (0.0156)	0.0003 (0.0097)	-0.0069 (0.0198)	-0.0054 -0.0089
<i>posttelecast</i>	0.0019 (0.0193)	0.0057 (0.0146)	0.0094 (0.0093)	-0.0226 (0.0181)	-0.0200** (0.0101)

All regressions are OLS, with robust standard errors in parentheses

Table 1.3: Questions About Own State and Rural/Urban Voters

	Own State	Rural Worker	Rural Worker	Depressed Industry	Depressed Industry
Sample	All MPs	All MPs	Rural MPs	All MPs	Rural MPs
<i>alt_post</i>	0.0079 (0.0113)	-0.0130*** (0.0056)	-0.0115* (0.0047)	0.0148** (0.0073)	0.0096** (0.0043)
<i>altweeks</i>	0.0024 (0.0095)	-0.011 (0.0091)	0.002 (0.006)	0.0001 (0.0055)	-0.006 (0.0061)
<i>posttelecast</i>	-0.0219 (0.0076)	-0.0144 (0.0151)	-0.016 (0.0061)	-0.0147** (0.0051)	-0.014** (0.0040)

All regressions are OLS, with robust standard errors in parentheses

Table 1.4: Congress Party MPs

<u>DepVar</u>	<u>Party Leade</u>	<u>Backbencher</u>	<u>FutureLeader</u>
<i>alt_post</i>	0.0842*** (0.0365)	-0.1351*** (0.0501)	-0.0029 (0.0253)
<i>altweeks</i>	-0.0357 (0.0242)	0.0677* (0.0362)	-0.0075 (0.0179)
<i>posttelecast</i>	0.0345 (0.0259)	-0.026 (0.0357)	0.0165 (0.0185)

All regressions are OLS, with robust standard errors in parentheses

Table 1.5: BJP MPs

DepVar	Party		
	Leader	Backbencher	Future Leader
<i>alt_post</i>	-0.0396 (0.0351)	-0.0743 (0.0538)	0.1034*** (0.0445)
<i>altweeks</i>	0.0453 (0.0282)	0.0172 (0.0427)	-0.0242 (0.0355)
<i>posttelecast</i>	0.0032 (0.0237)	0.1029 (0.0383)	-0.0685*** (0.0313)

All regressions are OLS, with robust standard errors in parentheses

Table 1.6: Janata Dal MPs

DepVar	Party Leade	BackBencher	Future Leader	Current Low
<i>alt_post</i>	-0.0162 (0.0437)	-0.128* (0.076)	-0.0240 (0.032)	-0.1087** (0.0518)
<i>altweeks</i>	-0.012 (0.0319)	-0.0221 (0.0566)	-0.018 (0.0253)	0.0389 (0.0423)
<i>posttelecast</i>	0.0135 (0.0318)	-0.0255 (0.053)	-0.028 (0.023)	-0.0185 (0.0371)

All regressions are OLS, with robust standard errors in parentheses

Table 1.7: Substantiveness of Questions

<u>DepVar</u>	<u>Progress of Scheme</u>	<u>Government Spending</u>	<u>Allocation of Funds</u>
<i>alt_post</i>	0.1331*** (0.0239)	0.0134 (0.0265)	0.0324 (0.0231)
<i>altweeks</i>	-0.036* (0.0191)	0.0017 (0.0207)	-0.0201 (0.0186)
<i>posttelecast</i>	-0.1186*** (0.0161)	-0.0497 (0.0185)	-0.0768 (0.0164)

All regressions are OLS, with robust standard errors in parentheses

Chapter 2

Caste and Religion in India's 'New Economy': Evidence From A Field Experiment on Labor Market Discrimination in Delhi

Summary 2 *We study caste and religion in India's new economy sectors – IT (software) and IT-enabled services, (call-centers) – by sending fictitious resumes in response to job openings in and around Delhi, India advertised in major city papers and online job sites. We find evidence of discrimination against Other Backward Classes and Scheduled Castes in call-center jobs, but no corresponding results for these or any other groups (including Muslims) in software jobs. We do however find that having a higher-quality resume helps SC applicants in the software industry the most, and OBCs not at all. We argue that the evidence for SCs is consistent with predictions from theories of statistical discrimination.*

2.1 Introduction

In India, caste is closely correlated with socio-economic status. Upper-caste Hindus have better economic outcomes both than non-upper-caste Hindus (Scheduled Castes, Scheduled Tribes, and Other Backward Classes, see Section 2.2 below for a more detailed discussion of what these categories mean), as well as Muslims, who constitute India's largest religious minority group. While detailed breakdowns of employment status and occupation by caste are hard to come by, the 2001 Census reports that while 3.5 per cent of Indians are classified as 'marginal workers', who were employed less than 6 months of the preceding year, this figure is 10.9 per cent for Scheduled Castes and 6.5 per cent for Muslims. Along these lines, the Sachar Committee, a government committee set up to probe the economic and educational status of Muslims in India claimed that Muslims had the highest unemployment rate of any socio-religious group in India (Sachar 2006). No systematic data about the representation of different caste and religious groups in different occupations is readily available, but anecdotal evidence on specific occupations suggests that non-upper-castes are under-represented relative to their population proportions: for example, several small surveys of workers in the IT industry in Chennai and Bangalore respectively found that between 75 and 86 per cent belonged to 'upper castes' and there were no SC workers in their sample; nationally, non-upper-castes constitute around 51 per cent of the population (Upadhyaya and Vasavi 2006, Krishna and Brihmadessam 2006)¹

To what extent is the observed (or at least plausibly hypothesized) under-representation of non-upper-caste groups in skilled occupations and sectors the result of active discrimination by employers when faced with identically-qualified candidates from different caste/religious backgrounds? Some commentators argue that it is the relative lack of suitably-qualified people from these groups available for employment that is responsible for their under-representation. In contrast to this, politicians representing Backward and Scheduled Castes argue that even when people from traditionally under-represented groups gain the adequate qualifications,

¹These are both tiny surveys and their sampling frame was unknown and unlikely to be truly representative, but these are the only estimates along these lines that we found.

they are shut out of good jobs due to discriminatory hiring practices. Answering this question based on even high-quality survey data would be difficult, given that researchers possess much less information about potential employees than employers do, so that workers who appear identical to researchers may look very different to employers. At the same time, it is worth noting that any research methodology that relies on the explicit co-operation of firms is likely to flounder on the basis of the fact that the caste composition of employment in the private sector in India is an extremely sensitive issue due to demands for affirmative action in the private sector, as Upadhyaya and Vasavi (2006) found when they tried to collect detailed data on IT firms in Bangalore. In this paper, therefore, we adopted a resume audit strategy, similar to that used in Bertrand and Mullainathan (2004) on race in the US to analyze whether firms in India's fast-growing 'new economy' sectors - namely software and IT-enabled-services (ITES or 'call-center') firms discriminate against equally-skilled members of historically disadvantaged caste groups (SCs and OBCs) and Muslims when deciding which candidates to call for interview. We sent resumes in response to job advertisements seeking people to work in software or call-centers in and around Delhi from major Delhi newspapers and the largest job website in India and measure whether our fictitious applicants were called back or not. We manipulate the caste or religion of the applicant by randomly assigning caste/religion-identified last names (such as Sharma, Bhatia or Aggarwal, all upper-caste last names, or Paswan, Manjhi or Pasi, all SC last names) to our fictitious candidates, typically sending two resumes in each caste cell. In the case of software jobs, we also manipulated the perceived 'quality' of the applicant by randomly using one high-quality and one low-quality resume in each caste cell. In all, we responded to 319 job ads, of which a small fraction (54 jobs) were call-center jobs and the rest software jobs.

Our results are more subtle than the strong race-based callback differentials found in Bertrand and Mullainathan (2004). On the one hand, we find no evidence that non-upper-castes are called back less often than equivalently qualified upper-caste applicants for software jobs, nor do we find any callback differences between upper-caste Hindus and Muslims for ei-

ther of the two kinds of jobs we apply for. We do, however, find relatively large and significant differences between callback rates for upper-castes and OBCs (and to a lesser extent SCs and STs) in the case of call-center jobs, which are less demanding in terms of formal qualifications and technical skills than software jobs, but require employees with better English-speaking abilities and other 'soft skills', such as grooming, Americanization, familiarity with telephone etiquette, etc, all plausibly the sorts of qualities potential employers may be tempted to guess from what information or clues a resume provides about an applicant's social background. Coupled with the finding that SCs have the highest return to having a high- rather than low-quality software resume, we argue that our results for the most part are consistent with what would be predicted by theories of statistical discrimination. However, we are unable to reconcile the results for OBCs, who both have the biggest callback gaps with upper-castes for the relatively less-skilled call-center jobs, but also get no return to having higher-quality resumes for technical software jobs, with existing theories of discrimination. We also find some intriguing differences by gender in the case of call-center jobs, with the results for SCs being driven entirely by callback differentials for male applicants, while the callback deficit is much higher for OBC women than OBC men. However, the small number of call-center jobs we responded to leads to an extremely small sample size when we break our applicants into caste-gender cells, preventing us from exploring these results further at this point.

The rest of this paper is organized as follows. Section 2.2 provides some background on caste and religious divisions in India and existing affirmative action policies. Section 2.3 provides a brief summary of previous empirical work on discrimination at the hiring stage. Section 2.4 explains the experimental design, including the rationale for choosing the sectors/jobs we focus on, the generation of identities for our fictitious applicants, and how resumes were created, assigned and sent, and callbacks tracked. Section 2.5 presents the main results of our work, and Section 2.6 interprets these results in the light of existing theories of discrimination. Section 2.7 concludes.

2.2 Background: Caste and Religion in India

Historically, Hindu society in India was divided up into endogamous sub-groups that were ranked hierarchically in a complex system of social stratification which had its roots in the ancient Hindu system of 'varna', which divided people into four categories based on their occupations, and which is usually referred to in English as the caste system. While historians are divided on when caste became strictly hereditary and how stable the rankings within the hierarchy were, by the early modern period, each region of India had a social structure that involved a complex web of castes and sub-castes related to each other by economic and patronage links that had both horizontal and vertical divisions. The caste system is both complex and ever-evolving, as a huge literature in social anthropology attests to (Dumont 1970, Ghurye 1961, Srinivas 1957, and Beteille 1969 are classic social-anthropological works on the caste system in India, while Beteille 1992 is a major recent works on the topic), and a detailed discussion of its intricacies is beyond the scope of this paper. However, several fundamental features of the caste system as it exists today are important in motivating the questions studied in this paper and understanding the choices made at the experimental design stage, and these are discussed briefly in the rest of this section.

First, while there is a great deal of variation between different regions of India in which groups occupy different parts of the caste hierarchy, it would be fairly accurate to say that while the top and bottom of the caste hierarchy are well-defined and understood by people in most parts of India, but there is considerable fuzziness about the precise position of groups between these extremes. Thus, Brahmin castes sit at the top of the caste hierarchy everywhere in India, followed by several non-Brahmin upper caste groups, who were traditionally powerful either by virtue of land ownership (Rajputs in Rajasthan, Jats in Punjab, Bhumihars in Uttar Pradesh and Bihar, for example), or education and access to professional/literate occupations (Baidyas in Bengal, Baniyas in most of North India, Kayasthas in Uttar Pradesh, Bihar and Bengal, and Khattris in Punjab, for example). Together, these are what we refer to as 'upper castes': another way of putting it is that people belonging to these castes are not thought

to have been discriminated against in their access to education and skilled jobs, and have been in one way or another socially dominant social groups in their respective regions. They will therefore constitute the group that we consider to be the equivalent of Whites in the American race context, though it is important to recognize that there are cultural, linguistic, and regional variations within this broad category, as well as that the difference between upper castes and the rest of Indian society is not precisely 'racial' in the American sense, so that issues of passing and recognition become more important than they would in that context. Nonetheless, upper castes constitute a minority of the population in India but are likely over-represented in skilled occupations, although systematic evidence on this is hard to find. As an example, Brahmins constitute about 5 per cent of India's population but 40 per cent of India's Associate Supreme Court Justices since 1950 have been Brahmins, and 37 per cent of the top tier of the Civil Service, the Indian Administrative Service, were Brahmins as of 2007 (Outlook 2007).

At the other end of the hierarchy, a heterogeneous group of castes were historically treated as 'untouchable' by the upper castes, and some such caste groups existed everywhere in India, constituting about 16.2 per cent of the population as of the last available estimates (Census of India 2001). These groups were historically considered 'unclean' and not permitted to use public facilities such as wells, schools, temples, etc., and forced to live in specific parts of the village or town in order to minimize contact between them and the upper castes. Occupational segregation and denial of access to education were key features of the discrimination faced by these groups, who were consigned to perform those jobs that upper caste Hindus considered 'unclean', such as working with dead animals or human bodies, garbage disposal, and the manual disposal of human excrement. Discrimination against members of these groups, commonly referred to by the term 'Scheduled Castes' (SCs), was officially made illegal by the Constitution of independent India in 1950², but anecdotal evidence suggests that even the most stark forms of caste-based discrimination continue to be rampant in Indian society.

²The term 'Scheduled Castes' comes in fact from the Ninth Schedule of the Indian Constitution, which lists for each state in India the specific caste groups who are eligible to benefit from the affirmative action provisions outlined in the Constitution).

Nonetheless, it is important for our purposes to note that reservations of places in higher education institutions, jobs in the public sector, and seats in regional and national legislatures, which are constitutionally mandated as a corrective for historical discrimination, have led to a sizeable and growing educated middle class among these caste groups, although it has been argued that one side-effect of the policy of reservations in educational institutions is discounting of SCs' paper qualifications by potential employers, who may consider an SC with the same degree as an upper-caste person as less skilled, because reservations may have allowed the SC person to gain admission into a college or course with lower grades than would otherwise have been possible. Be that as it may, both educational and economic indices for SCs remain well below the national average, and little is known about occupational patterns by caste in the private sector, since positive discrimination policies do not apply to the private sector and no systematic attempts have been made to collect the relevant data. SCs are thus one of the groups we focus on in this experiment as an obvious social group whose members might be expected to face systematic disadvantages in the job market even if they are able to acquire the necessary skills. Similar considerations and legal provisions apply to India's indigenous tribal groups, known as the Scheduled Tribes, who are a much smaller share of the population but also have access to the proportional reservation like the Scheduled Castes. STs continue to have the lowest educational and social indicators of all of India's social groups, and it has been argued that geographical isolation and lack of political success are in some measure responsible for this.

In the early 1990s, the Indian government implemented a further set of positive discrimination policies in public sector jobs, 27 per cent of which were reserved for members of what were referred to as 'Other Backward Classes', or OBCs. While the basis for identifying groups for possible inclusion in the OBC category was 'caste', the aim was not so much to correct for historical discrimination per se as to remedy perceived educational and social inequality in Indian society: while OBCs were by no means subject to the sorts of humiliating and degrading untouchability-based social exclusion as SCs, they were less literate and

under-represented in skilled professions relative to their share of the population. In essence, the OBC category is a collection of caste groups who ranked just above the untouchables in the ritual hierarchy but were educationally and socially 'backward', as measured by their low literacy, early age at marriage, low female literacy, etc. The OBCs are therefore another broad caste group whose job search experiences we try to understand using the experiment discussed in this paper.

In addition to the caste groups mentioned above, India also has a substantial Muslim population which constitutes its largest religious minority at about 12 per cent of the population. While we treat Muslims here as a homogeneous group, it is important to note that there are huge disparities within the community in terms of education and occupational status. A tiny minority of Muslims in India are descended from groups that claim descent from Arab or Persian invaders, and are on average better-educated than the Muslim average, and economically more similar to upper-caste Hindus. However, partly because of the legacy of the Partition of India in 1947 and continued historical tensions between Muslims and Hindus that have led to repeated religious riots and pogrom-like situations (see Varshney 2002, Brass 1996), it has been argued that even better-off and educated Muslims face continued discrimination in Indian society, leading to calls for positive discrimination policies such as those in place for SCs and OBCs. In addition, the vast majority of Indian Muslims are descended from lower-caste converts who in many cases continued to interact with the upper castes (and, it has been argued, with their Arab/Persian-descended co-religionists, see Sikand 2006, Ansari 1960, and Aggarwal 1978 for discussions about caste among Indian Muslims) in a way dictated by their ancestors' pre-conversion caste status and to continue to suffer from many of the forms of discrimination faced by Scheduled Castes in addition to any discrimination modern Indian society may direct towards Muslims as a religious group. We therefore also try to measure whether Muslims face disadvantages in their job search process relative to upper-caste Hindus.

The relationship between caste and last name is crucial to our experimental strategy here.

Hindu last names are, in the vast majority of cases, indicative of the person's position in the caste hierarchy, although the enormous regional variations mean that the precise coding of a particular last name is unlikely to be familiar to people from a different linguistic region of India. Muslims have distinctive first and last names that are immediately informative about their religion but may mask differences in background before conversion³ We therefore use last names as our signal of caste background (except for Muslims, who have Muslim first and last names), as will be explained in more detail when we discuss how we generated our applicants' identities. It is important to point out that there may be differences in frequency of particular first names by caste (and class), but we do not attempt to exploit this since last names are better suited for our purposes and are actually linked to caste. We do try to avoid any possible conflation of caste and class by rotating the same set of extremely generic Hindu first names among all categories of applicants (see Section 2.4.3 below).

2.3 Previous Research

Altonji and Blank (1999) define labor market discrimination as 'a situation in which persons who provide labor market services and who are equally productive in a physical or material sense are treated unequally in a way that is related to an observable characteristic such as race, ethnicity, or gender'. While persistent wage gaps by race, for example, have long been documented for countries like the US, it has been pointed out that gaps in labor market outcomes, such as wages, while consistent with active discrimination on the part of employers, are not clear evidence of it, since standard labor force surveys do not contain all employee characteristics that employers use to make hiring, pay and promotion decisions, so that it is difficult to be certain that two workers who look identical in terms of the characteristics contained in survey data are truly identical from employers' point of view.

The difficulties of inferring unequal treatment from aggregate data have led researchers to use a variety of quasi-experimental and experimental approaches to measuring workplace

³One exception is Muslims descended from upper-caste Hindu converts, who tend to have retained their pre-conversion Hindu upper-caste last names but adopted Muslim first names.

discrimination at the hiring/pre-hiring stage. An influential quasi-experiment is Goldin and Rouse (1997) which looks at the impact of the introduction of blind auditions into the process of hiring in orchestras, and infer gender discrimination from changes in the treatment of women candidates. Experimental approaches have included labor market audit studies, where comparable minority and non-minority (or male and female) actors are sent to actual interviews to measure differential treatment (see Altonji and Blank 1999 for a survey of such studies). However, as Heckman and Siegelmann (1992) and Bertrand and Mullainathan (2004) point out, the fact that the actors are aware of the purpose of the experiment as well as the difficulty of ensuring that the mock candidates in a pair are truly 'observationally identical' apart from the gender/race difference are serious problems with these approaches. Finally, resume audit studies such as this one, where researchers manipulate the perceived race (or other group membership characteristic, such as ethnicity) of applicants by randomly assigning names that signal a particular social group, provide what is perhaps the cleanest evidence that is available so far on differential treatment by race at the earliest stage of the hiring process, i.e. whether or not applicants are called for an in-person interview or not. The best-known and largest-scale one of these is Bertrand and Mullainathan (2004), on which the research here is based, which finds large gaps in callback rates by race. However, these studies suffer from the crudeness of the outcome they measure: whether or not race (or another group identity characteristic, such as gender, ethnicity, etc.) affects the probability of a candidate being *called back for interview*, rather than the actual probability of being hired, although 'to the extent that the search process has even moderate frictions, one would expect that reduced interview rates would translate into reduced job offers' (Bertrand and Mullainathan 2004: 11). Nonetheless, the inability to comment about the eventual likelihood of candidates belonging to different groups actually being hired or the pay offers made to them, constitute serious weaknesses of this otherwise clear approach to the issue of discrimination in the job market.

2.4 Experimental Design

2.4.1 Identifying Jobs/Sectors for the Experiment

In order to implement a resume audit in the context of the Indian job market, it was necessary to identify sectors and jobs to which fictitious resumes would be sent. Scanning the job supplements of the two highest-readership English-language dailies in Delhi (the Times of India and the Hindustan Times) as well as the two largest online job sites (Naukri.com and Monsterindia.com) revealed that the key constraint for the purposes of this experiment was the method of recruitment used to fill positions advertised.

Unlike in the US, recruitment to several kinds of jobs and sectors in India could not be studied using a resume audit, since the method of recruitment followed by employers in filling these positions made them unsuitable for inclusion in our research. Most lower-level positions in the private sector (for example, secretarial jobs, administrative positions, lower-level sales positions) are filled not by soliciting resumes but by asking potential applicants to 'walk in' with their resumes at a time and place mentioned in the advertisement. Jobs in the public sector, banks, educational institutions, etc. were also unsuitable because they recruited either through examinations or required supporting material such as exam score-sheets to be mailed as part of the application process.

On this basis, we restricted ourselves to applying to two categories of jobs for which the first stage of recruitment involved the screening of resumes, and of which there was a steady flow of new openings advertised through newspapers or online job sites. These were what we refer to as 'software jobs' and 'call-center jobs', shorthand for openings for software engineers (primarily but not exclusively in firms whose main business was producing software), and openings for Customer Service Agents in the BPO (Business Process Outsourcing, or Call-Center) industry, respectively. Broadly speaking, the former were technical jobs, requiring either formal engineering qualifications or a specified set of software skills, or both, whereas the latter were open to a college graduate in any field. Both the IT sector, to which most of our software resumes were sent, and the ITES ('IT-enabled-services) sector, which includes

the call-centers we applied to, are rapidly growing sectors in India, which explains the steady flow of new job openings: NASSCOM, the trade association for the IT and ITES industries in India, estimates that employment in software firms grew from 215,000 in 2004-05 to an estimated 398,000 in 2006-07. In the same period, employment in call-centers, which includes the non-technical call-center jobs we applied for, grew from 216,000 to 409,000 (NASSCOM 2007). These are, of course, figures for India as a whole, whereas we sent resumes only to jobs recruiting in Delhi, which is one of the several major centers of these industries.

The difference in the requirements for the two kinds of jobs is clear from a comparison of the columns in Table 2.1, which summarizes the information the job listings provided about the qualifications, skills, and experience of the people they sought to hire. Almost all software jobs have an experience requirement, while one-third of Call-Center positions are entry-level, and those that do require prior work experience ask, on average, for 1.5 fewer years of experience than software jobs. About 41 per cent of software jobs explicitly mention an Engineering degree requirement and 29 percent also mention a Master of Computer Applications degree, whereas none of the call-center jobs do (these are not jobs for call-center positions involving technical assistance). In contrast, none of the software jobs are open to someone with just a Bachelor of Arts degree, whereas the 68 per cent of call-center jobs which mention a formal qualification all accept (non-engineering) college graduates with no other formal qualifications. Call-center employers are much more concerned about potential employees' 'presentability' - measured by such criteria as unaccented, fluent English, Americanization, familiarity with phone etiquette, etc., than software employers are. For our purposes, this meant that we expected a far greater reliance on subtle markers of social background on the part of employers in the call-center industry and a greater emphasis on formal technical qualifications in the software industry. Throughout this paper, we will therefore present results separately for software and call-center jobs, since the difference in the nature of the jobs suggested caste, with its potential to signal social background, might play a more crucial role in the call-center industry than in software, where formal technical qualifications might be

expected to be paramount.

2.4.2 Creating A Bank of Resumes

The next stage of the experimental design involved generating templates for the resumes to be sent in response to advertisements for the two kinds of jobs discussed in Section 2.4.1. The goal was for resumes to be realistic and representative of the kinds of resumes that jobseekers sent out, without using real people's resumes. As a starting point, we began with real resumes which job-seekers who were seeking jobs like the ones we would apply to had posted on the job site www.naukri.com. We then removed names, addresses, etc. from these resumes, and modified them by changing the names of the educational institutions from where degrees were listed, and the firms in which the person had worked, if any. However, we maintained the structure of the resumes so as to mimic real job-seekers' resumes as closely as possible without using real resumes.

In the case of resumes of software professionals, we also classified the resumes into two groups, high and low quality. We used several features of the resume to differentiate between 'high-quality' and 'low-quality' resumes: the bachelor's degree listed (whether or not it was an engineering qualification and whether or not it was from a top-10-ranked engineering college), whether the resume listed additional computer-related qualifications such as an MCA (Master of Computer Applications), an IBM Ace Certification, or a Cisco Professional Certification (which were qualifications we found to be commonly listed on resumes of people seeking employment as software professionals), and the number of on-the-job projects (a crucial part of the resume for software professionals, who use it to demonstrate the range of their technical capabilities) . We also added extra computer-related qualifications or skills to some of the high-quality resumes, and manipulated the institution that granted their undergraduate degree, and whether they mentioned a high score at the Bachelors' level. The differences between high-quality and low-quality software resumes can be seen from Columns VII and VIII of Table 2.5. Resumes that we classified as high-quality were much more likely to have a BTech/BE degree, and to mention high undergraduate college grades/marks. They

were also more likely to have a computer-related skill certification of the type mentioned above, to have an MCA, to know UNIX and Oracle, and to have worked on more projects in previous jobs. Notice that high-quality and low-quality resumes did not differ in terms of whether or not they had an undergraduate degree of some kind (all of them did), and whether they provided a list of software skills (another standard feature of actual software professionals' resumes) or years of experience in the industry, since we did not want resumes that were either over-qualified or under-qualified for the pool of jobs we would apply for.

This process left us with a a set of realistic resume templates for each job category, software or call-centers, with the software resume templates being further classified into high and low-quality resumes.

2.4.3 Identities of Fictitious Applicants

Generating the identities of the fictitious applicants was a key part of the experimental design. As explained above in the discussion of the link between last names and caste, while last names are usually but not always linked to caste in India, there are many regional variations in the caste connotation of different names. For this experiment, we wanted a list of last names which are linked to castes in different parts of the caste hierarchy (upper-caste, scheduled caste, scheduled tribe, and other backward caste), but also which would be likely to be recognized as such by people scanning resumes at firms to which we would apply.

We began by preparing a list of last names of people belonging to the broad caste categories we were interested in. While it was straightforward to find upper-caste-identified names, we got our SC/ST last names from two main sources. The first was Election Records available on the website of the Election Commission of India, from where we acquired a list of Scheduled Caste and Scheduled Tribe last names by state, by exploiting the fact that constitutionally-mandated positive discrimination policies in India earmark some seats in the national Parliament as reserved for members of the Scheduled Castes or Scheduled Tribes, which means that only members of the specified groups can compete. By scanning the list of candidates from reserved seats in the 1991 general elections, we were able to draw up a

list of Scheduled Caste/Tribe last names by state for the the north Indian states of Uttar Pradesh and Bihar, as well as for Gujarat, Maharashtra, West Bengal, and Tamil Nadu. We supplemented this list with information from a list of names of people who had applied for admission under the quotas for Scheduled Castes and Scheduled Tribes in one of the undergraduate colleges of Delhi University. For OBC names, we consulted the official list of OBCs for states in North India.

Next, we carried out a small survey among university students and faculty to check what associations, if any, people made between names and caste/religion. In particular, we were concerned to see whether people who lived and worked in New Delhi would make associations between caste and names from other parts of the country. We presented survey respondents, who were all either students or faculty at a number of Delhi undergraduate colleges, with a list of names, followed by a series of descriptive phrases that could potentially pertain to the profession, wealth, or the class, linguistic, caste, or religious background of the person named. Respondents were instructed to circle all the phrases that they thought described the person named.

While our survey was small and not intended to be analyzed rigorously, it did clarify several things that aided the choice of names for the experiment. The first was that our respondents, who all lived and worked in Delhi and the majority of whom self-identified as being from one of the North Indian states of Uttar Pradesh, Bihar, Delhi, Punjab, were not familiar at all with the link between caste and last name for names from the states of Gujarat and Maharashtra. The second was that Muslim names were universally recognised as such, as were upper-caste names from North India. Finally, at least some Scheduled Caste and Scheduled Tribe names from North India and Bengal, while not eliciting universal recognition, were recognized by large fractions of those we surveyed as being associated with the correct caste category: over three-quarters of our respondents recognized Paswan, Manjhi, Kori, Mandal, Jatav and Pasi as being Scheduled Caste last names⁴.

⁴Our surveys included the last name 'Chamar', which is the name of a particular caste classified as Scheduled Caste, but not commonly used as a last name. We found that it was universally recognised as being Scheduled

Based on the results of our survey, we restricted ourselves to using last names from North India. Last names were paired with common North Indian first names⁵ so as to generate a set of full names. We rotated the assignment of first names to last names so that, for example, in one month our SC male applicant might be called Anil Mandal and our upper-caste male applicant Suresh Arora, whereas the next month our SC male applicant might be called Suresh Paswan and our upper-caste male applicant Anil Gupta. Muslim applicants, of course, had Muslim first names. Once the set of full names which were being used in each round of the experiment were finalized, we opened an email account for each fictitious applicant on www.rediffmail.com, a popular web-based email service in India. As we discuss in Section 3.4 below, these email addresses were used to mail out resumes in response to job advertisements, and in some cases callbacks were received by email. Finally, each caste/religion-gender cell (for example, Upper Caste Male, Scheduled Caste Female, Muslim Female, etc.) had a unique, functional cellphone number at which firms could contact him or her.

Applicants were also randomly allocated either of two types of residential addresses, 'high' or 'low'. Neighborhoods in Delhi, as in most cities, vary a great deal in terms of the socio-economic profile of their residents. This is reflected in the system of property tax assessments that is used by the Municipal Corporation of Delhi, which categorizes all neighborhoods (known as 'colonies') into one of 8 categories, with a unit area in a Category A neighborhood being valued at roughly 6.3 times the corresponding area in a Category H neighborhood⁶. Using this, we chose addresses in Category A or B neighborhoods⁷ as our 'high' type addresses, and addresses in F or G category neighborhoods⁸ as our 'low' type addresses. We would expect the differences in the socio-economic status of typical residents of these neighborhoods

Caste, but we did not use it in the experiment because it is not commonly used as a last name.

⁵The first names used were: Amit, Anil, Ashok, Dinesh, Deepak, Kamal, Rajiv, Sunil, and Suresh for Hindu males, and Anita, Manju, Sangeeta, Seema, and Sunita for Hindu females.

⁶The tax differential is, of course, a multiple of this multiple because category A houses are much larger than Category F, G or H houses.

⁷The 'high' type addresses were in the following neighborhoods: Greater Kailash-I, Greater Kailash-II, Jor Bagh, Safdarjung Enclave and Vasant Vihar, all of which are in South/Central Delhi and are Category A or B neighborhoods.

⁸The 'low' type neighborhoods were Mangolpuri, Seelampur, Rehgarpura, Nand Nagri, Welcome Colony and Balmiki Colony, Mandir Marg.

to be obvious to any person reading one of our resumes who was familiar with the city.

2.4.4 Responding to Job Advertisements

Each week, we used our online and print job listings to generate a list of software and call-center positions which we could apply to. Once all jobs had been listed, we randomly assigned the names we were using in that round of the experiment to resume templates. The mix of caste and religion for the applicants varied through the course of the experiment, which had two phases. In the first phase, which covered the first four months of the experiment, we applied for 154 jobs, sending 8 resumes⁹, two in each caste/religion cell. While we always sent two resumes using Upper Caste names and two using Scheduled Caste names, for the first 116 jobs, we sent two Scheduled Tribe resumes, and two Muslim resumes, while for jobs 117-54, we sent two Other Backward Caste resumes and two Hindu Neutral resumes. In November 2004, we expanded the experiment by increasing the number of resumes sent in response to each job opening to 12, so that we could always send two resumes (one male and one female¹⁰) in each caste/religion cell. In all we sent resumes in response to 319 jobs, of which 54 were call-center jobs and the rest software jobs.

Research assistants then merged the resume template with an appropriate 'contact details' section header, which had the applicant's name, fictitious address, and functional cellphone number and email address. They then opened the email account of the fictitious applicant, pasted a standard, short cover letter into the body of an email, attached the appropriately-renamed resume¹¹ to the email, and sent it to the email address specified in the job listing with the appropriate subject line¹². The aim of this rather mechanical system of sending out

⁹Because of the rapid growth in these industries, we were confident that sending this many resumes would only insignificantly alter the overall pool of resumes received for each job ad, which typically run into the thousands. In the case of call-center jobs, ads often mentioned that they were looking to hire several hundred new workers.

¹⁰We used only male names for the first 36 jobs we applied to, after which we used one male and one female name in each caste/religion cell.

¹¹Once the contact details block had been merged with the body of the resume, RAs were instructed to save the resulting resume as either `cv_firstinitial_lastname.doc` or `resume_firstinitial_lastname.doc`.

¹²Most job advertisements specified what the subject line of the application email should say (for example `SrSoftwareEng/DEL`). If there was no specified subject line, the default instruction to RAs was to use 'Application for (Name of Position)'

applications was to ensure that our 'applicants' looked different from each other only in ways that we intended.

2.4.5 Measuring Responses

Answering machines are relatively little-used in India, and voicemail is not standard on most cellphone contracts, so that we could not rely on people leaving messages that would allow us to record callbacks. However, since we had one cellphone for each fictitious applicant, it was straightforward to track callbacks. Research assistants were instructed to record all the 'missed calls' on each cellphone, and to then call each number back and find out where the call was from, and record a callback as well as the date of the call in the spreadsheet against the job and 'person' in question. (In a small number of cases, applicants received 'callbacks' only over email; it was somewhat more common for the recruiter to both call the person and send an email). In practice, if the same number was recorded as having called several of our cellphones, it was only necessary for RAs to call it once and figure out which firm had called; once that was done, checking which phones the firm had called provided the information about which candidates the firm had called back. If it proved necessary to engage in further discussion, RAs were instructed to politely decline the offer of an interview citing another job offer that they had just accepted.

We could not track any responses that may have arrived by mail for our fictitious applicants, though Human Resources professionals informed us that because most firms in these sectors have a tight recruitment schedule, they prefer to use the telephone rather than rely on the postal system (though they may sometimes use email) since a phone call allows them to confirm the candidate's availability for interview and schedule a time in a single step.

2.5 Results

2.5.1 Mean Callback Rates by Caste/Religion and Job Type

Tables 2.2a, 2.2b and 2.2c compare the mean callback rates for Upper Castes to those for SCs, OBCs and Muslims respectively. The upper panel in each table shows the callback rates for software jobs, while the lower panel shows the corresponding rates for call-center jobs. As discussed in Section 4.4 above, the structure of the experiment was such that the composition of the non-upper-caste category of applicants varied over the course of the experiment, because while UC and SC resumes were sent to every job, not all jobs received applications from OBCs, STs, and Muslims. Each panel thus includes only jobs for which resumes were sent in both caste/religion cells being compared, so that the number of observations and callback rates for upper castes vary between panels. (We try to control for differences between firms to which resumes were sent more systematically in the regression estimates that follow.)

The difference between callback rates for software versus call-center jobs is striking, with software jobs having much lower callback rates: the average callback rate over the entire experiment was 5.23 per cent for software jobs and 18.23 for call-center jobs. However, whereas we see large differences between callback rates for upper-caste and OBC applicants to call-center jobs (and smaller differences between UC and SC applicants), we see no such difference for software jobs, where we are unable to reject the hypothesis that upper-castes get callbacks at identical rates to OBC and SC applicants, although the mean callback rates are actually lower for upper-castes. It is also striking that Muslim applicants are almost exactly as likely to be called back as upper-caste Hindu applicants in both kinds of jobs. Finally, there are intriguing differences between callback rates for SC and OBC women and men relative to their upper-caste counterparts in the call-center industry. The difference we observe between SC applicants' callback rates and those for upper-caste applicants to call-center jobs is entirely because SC men are much less likely to be called back than upper-caste men, whereas SC women are exactly as likely to be called back as upper-caste women. The opposite is true of OBCs, for whom women appear to suffer a greater disadvantage in

callbacks for call-center jobs than men. Given the very small gender-caste cell sizes, we do not explore these differences by gender further at this point.

2.5.2 Regression Results, Software Jobs

In order to explicitly control for firm-level heterogeneity, results from regressions with firm fixed effects are presented in Table 2.3, which compare the differences in callbacks between UC applicants and the other, non-upper-caste categories, namely SC, OBC, Muslim and ST applicants. The sample of resumes is all resumes with a 'non-neutral' surname sent in response to software jobs, and the coefficients of interest are those on the various caste dummies (SC, ST, OBC, and Muslim) which measure how callbacks from that caste/religion category fared in comparison to upper-caste candidates. Column I reports results from a regression with no attempt to control for the quality of resume sent, while Column II controls for differences in resume template quality by adding a dummy for high-quality resumes (we do not expect this or the address quality variable, which is included in all regressions, to make a difference to our estimated coefficients of interest, since addresses and resumes were randomly allocated to caste cells). The coefficients of interest are small and insignificantly different from zero, reinforcing the conclusion from the simple test of proportions in Table 2.2: for software jobs, upper-caste candidates are no more or less likely to be called back than candidate of any comparison group. Note, however, that the estimated coefficient on the high-quality resume dummy (see Column II) is positive and highly statistically significant, suggesting that the resume quality manipulation worked on average. This will be explored further in Section 2.5.5 below.

2.5.3 Regression Results, Call-Center Jobs

Table 2.4 repeats these regressions for call-center jobs. The point estimates on the non-upper-caste dummies are all negative, though they vary greatly in magnitude, with the greatest disadvantage seen for OBCs, followed in descending order by STs and SCs, with the estimated coefficient on Muslim being the smallest. Upper-castes are thus more likely to be called back

than both SCs and OBCs, though the effect is statistically significant at conventional levels of significance only for OBCs and STs¹³. The 12.9 per cent callback rate difference between upper castes and OBCs means, given the mean rates, that an upper caste candidate is approximately 89 per cent more likely to be called back than an OBC candidate who has the same resume (see column III of Table 2b). Another way to express this result is that on average, an upper-caste person applying for a call-center job gets two callbacks for roughly every 7 jobs s/he applies for. An SC or ST candidate, however, must apply for 12 jobs, and an OBC applicant to 14 jobs to get two callbacks. Given the slow rate of arrival of new jobs of this kind, which was the main constraining factor for the purposes of our study, and a potentially low (even if identical) conversion rate of callbacks into actual job offers, this could represent non-trivial differences in job search costs by caste. A candidate with an OBC last name therefore has a significantly more difficult time getting an interview than an identically-qualified upper-caste candidate who applies for the same job.

2.5.4 Callback Rates at the Firm Level

Rather than studying the distribution at the applicant level as in Tables 2.2-2.4, we can tabulate differences in callback rates at the firm level by calculating the fraction of firms who treat two categories of applicants equally (that is, who call back either none, one, or two applicants in each caste category), or those who favor either upper castes (calling back both uppercastes and 1 or 0 SC/OBC candidates, or 1 upper-caste and 0 OBC/SC candidates) or SCs/OBCs (calling back both SC/OBC candidates and 1 or 0 upper caste candidates, or 1 SC/OBC and 0 upper-caste candidates). Table 2.5a presents the results of this exercise for call-center jobs, comparing the treatment of upper castes to SCs in Panel A, and to OBCs in Panel B. 70.4 per cent of firms treat Upper castes and SCs equally and 64 per cent treat upper castes and OBCs equally. As expected, the major part of the equal treatment comes

¹³The lack of statistically significant results for SCs and STs is at least in part because of the very small number of call-center jobs (54) we were able to apply for. The raw difference in mean callback rates for SCs and UCs would be significant at the 95 percent confidence level, assuming no change in callback rates, if we applied to 92 more jobs. In comparison, we would need to apply for 5,900 more jobs for the current UC-Muslim callback rate difference to be statistically significant.

from firms from whom no callbacks to either group are recorded. 16.67 per cent of employers favor upper castes relative to SCs and 12.96 per cent favor SCs relative to upper-castes, a difference in proportions that is not statistically significant. However, while 29 per cent of employers favor upper-castes over OBCs, only 6.45 per cent of employers discriminate in the reverse direction, a difference in proportions that is statistically very significant ($p=0.02$), in spite of the small sample. At the firm level too, therefore, it seems that significantly more firms discriminate against OBC candidates than favor them.

The same exercise is carried out for software jobs in Table 2.5b. Here too equal treatment dominates by virtue of the large fraction of firms who did not call any of our candidates back. However, although a greater fraction of firms actually favor SCs over upper castes than vice versa, the difference in proportions is insignificantly different from zero. A greater fraction of firms favor upper castes over OBCs than favor OBCs over upper castes, but this difference is also statistically insignificant.

2.5.5 Returns to Resume Quality: Software Jobs

As discussed in Section 2.4.2 above, the resume template design stage included an attempt to manipulate the perceived quality of some resume templates which were used to apply for software jobs. This was done by adding formal computer qualifications, more programming skills, more impressive academic credentials, and a longer list of on-the-job projects completed in the software industry. Table 2.6 summarizes resume characteristics by caste/religion (Columns I-VI) and by resume quality (Columns VII and VIII). Since caste was randomly allocated, we do not expect resume characteristics to vary by caste/religion, as Columns I-VI indicate. Columns VII and VIII show how high-quality resumes differed from low-quality resumes, that is, how the resume quality manipulation was implemented. The quality manipulation was quite subtle, since we did not wish to make our candidates either grossly under- or over-qualified for these software-engineering jobs: all our candidates therefore had bachelors' degrees (though those with high-quality resumes were more likely to have studied engineering and to mention high college grades); and high- and low-quality resumes did not differ

substantially in whether or not they listed a set of software skills and claimed proficiency in some set of software tools and operating systems, though high-quality resumes were more likely to know UNIX in addition to Windows, to have a formal computer skills certification or an MCA than low-quality resumes.

The callback rates tabulated in Table 2.7 show that the resumes we classified as 'high-quality' were 60 per cent, or 2.41 percentage points, more likely to be called back than those we classified as 'low-quality'; and that this difference is highly statistically significant. On average, therefore, the resume quality manipulation seems to have worked. Table 2.8 presents the results of regressions with firm fixed effects, which measure the effect of having a high-quality resume for the whole experiment as well as for each caste/religion cell separately. Reading across the columns of Table 2.8 suggests that the benefit in terms of getting more callback differed between caste/religion cells. In particular, having a 'better' resume increases the likelihood of being called back for the most for SCs, Muslims, upper castes, and STs (though the coefficient for STs is similar in magnitude to that for the entire sample, it is not statistically significant). It does *not* work at all, however, for OBCs, whose estimated 'return' from having a better resume is virtually zero. Thus, while upper castes, Muslims, SCs and STs get a large return to having a better set of skills, the same appears not to be true of OBCs. These results will be interpreted in light of what we find for the 'less-skilled' jobs, i.e. the call-center jobs, and economic theories of discrimination in the labor market, in what follows.

2.5.6 Callbacks by Name: Call-Center Jobs

Table 2.9 reports callback rates by last name for each of our caste categories for resumes sent in response to advertisements for call-center jobs (the jobs where we did find significant evidence of unequal treatment, with upper-castes being favored over OBCs and to a lesser extent over SCs/STs, but not over Muslims). Column III classifies names into those that had an above-median callback rate and those that had a below-median callback rate, with the median callback rate for call-center jobs in our experiment being 18.23 per cent. From

Panel A, which lists callback rates for the upper-caste last names used in the experiment, we see that 5 of the 6 upper-caste names had above-median callback rates. From Panels B and C, we see that only 1 of the 4 OBC names and 2 of the 6 SC names had above-median callback rates. Muslim names are almost equally divided between those that receive above-median callbacks (4 out of 7) and those that do not (3 out of 7). Broadly speaking, these results confirm the pattern we see from the more aggregated picture in Table 2.1: while most upper-caste names receive above-average callbacks, this is not true of OBC and SC names.

2.6 Interpretation

Three sets of issues that arise in interpreting the results above are discussed in what follows. First, we discuss what our findings about callback rates imply about discrimination. Secondly, we discuss the issues that arise out of the fact that the HR professionals reading our resumes potentially do not recognize the caste connotation of the last names used in our experiment. Finally, we attempt to put the results in perspective by thinking about how they may relate to existing theoretical models of discrimination in the job market.

2.6.1 Interpreting Callback Rate Differentials

For call-center jobs, our results indicate that an individual with an OBC (and, to a lesser extent, an SC or ST name) name is significantly less likely to get called back by a prospective employer than an identically-qualified person from an upper caste. Does the fact that we find differential treatment of OBCs relative to Upper castes within our experiment necessarily imply that employers are discriminating against OBCs? In other words, could it be the case that although OBC candidates in our experiment are less likely to be called back than our upper-caste candidates, on the whole employers do not discriminate against OBCs while shortlisting candidates to be called for interview when we take the entire pool of resumes they receive into account?

If employers did not take caste into account while ranking resumes, they would rank

all CVs according to quality, and call back those candidates whose resumes were above a threshold quality¹⁴. Because names are randomly allocated to resumes, the resumes of candidates from different castes should rank similarly on average. So irrespective of what the composition of the rest of the applicant pool is, a selection process that did not take caste or religion into account should produce identical callback rates for upper castes and those of other castes/religions. Indeed, this is precisely what does happen in our experiment with respect to Muslims and upper-castes: on average, candidates from these two groups are exactly as likely to be called back. That this does not happen for SCs and OBCs therefore suggests that those screening resumes must be taking caste into account in making their callback decisions. This is precisely what Altonji and Blank (1999) define labor market discrimination to be: 'a situation in which persons who provide labor market services and who are equally productive in a physical or material sense are treated unequally in a way that is related to an observable characteristic such as race, ethnicity, or gender'.

As discussed in Section 2.3 above, a key weakness of the resume audit approach is that we are forced to rely on a very crude and somewhat unsatisfactory outcome measure, that is, whether or not a person is called for an interview. Whether or not what we find about callback rates translates into actual differences in hiring and wage outcomes is of course not something we are able to study. It is in theory possible that OBCs have higher interview-to-job conversion rates than upper castes, so that the callback differential we see does not translate into a difference in the outcome we really care about, which is hiring. Nonetheless, given the rate at which new jobs arrive, a large difference in the likelihood of callback is a serious issue in itself in that it makes the job search much more tedious and time- and effort-intensive for candidates from certain caste groups than others. Since little is known about the caste composition of the workforce in the occupations we study, we cannot make any claims about the rates at which candidates from different castes or religions are represented in these occupations.

¹⁴In conversations with several HR professionals, this was precisely the process described by them as being the norm.

2.6.2 Are Our Results Really About Caste and Religion?

One concern with our experimental procedure arises from the fact that unlike in Bertrand and Mullainathan (2004), we are less than certain of the degree to which those reading resumes and making callback decisions are associating a last name that is in fact linked with a particular caste/religious category with that caste/religion. We do not have precise information about these correlations, but it appears from Table 2.7 that there is a great deal of variation by actual last name used, and that this is true even of Muslim names, which our survey respondents always recognized as such: at least with Muslims, we can be sure that the variation in callback rates by last name is not likely to be because some names were more 'recognizable' than others as Muslim names. While it is not possible to be more explicit about whether this is also the case for SC and OBC names in the absence of more systematic data about the associations HR professionals make between caste and last name, these concerns may be obviated somewhat by our having used those North Indian SC/OBC names which were relatively likely to be correctly 'recognized' as belonging to a particular caste category by those who we surveyed before finalizing the names of our fictitious applicants. Note that to the extent that a last name is, for most people, not something they choose¹⁵, we are less concerned here than in Bertrand and Mullainathan (2004) about the possibility that people of a particular education or skill level within the caste groups we study about are choosing the 'stereotypical' names we use in our study. What would be a problem instead is if we deliberately chose names that were uncommon in the actual SC or OBC population but which had a higher-than-average recognition rate. However, our names were chosen from a pool of last names that SC and OBC people commonly had and used (see Section 2.4.2), so that this is unlikely to be an issue. To the extent that the names we chose are representative

¹⁵Some people do adopt caste-neutral last names in an attempt to hide caste background, but this is complicated by the fact that many of these last names are also used by upper castes who have decided to mask their caste identity. This is what was behind our using the 'Neutral' name category in this experiment: however, given no significant evidence of differences in callback rates between candidates with Neutral names and upper caste names, we can only surmise that recruiters are in fact making the right association on seeing these names, which is not to make a caste association at all (since on average the names are probably as likely to be upper caste as lower caste).

of what actual candidates' names are likely to be, the results we find should be similar to what would be faced, on average, by actual SC or OBC candidates applying for the kinds of jobs we applied for. The issues around name recognition and the possibility of some people from Scheduled Castes and Other Backward Classes 'passing' as upper caste on the basis of relatively less-recognizable names is, however, one that deserves further exploration.

2.6.3 Relation to Existing Theories of Discrimination

Existing theories of discrimination in the labor market can be broadly classified into two categories: taste-based models and models of statistical discrimination. The basic gaps in callback rates that we observe for call-center jobs are, of course, consistent with either sets of models. However, in what follows, we will attempt to see to what extent existing models of discrimination are able to reconcile all the findings described above - about the groups and jobs for which we do and do not find callback gaps, as well as the findings about the differential returns to higher resume quality in the technical, software-engineering jobs.

Taste-based models, based on the work of Becker (1971), argue that at least some members of the majority group (either employers, customers, or other workers) are prejudiced against members of minority groups, which is usually formalized by positing that majority-group members have a 'taste' for discrimination. Becker argued that the existence of free entry and/or CRS would eventually drive discriminating firms out of the market, so that taste-based discrimination could not persist in a long run competitive equilibrium. However, these models have been more recently modified by Borjas and Bronars (1989), and in subsequent papers by Black (1995), and Bowlus and Eckstein (1998) who point out that imperfect information about the locations and preferences of customers, employees, and employers will limit the ability of competition to eliminate the effects of prejudice on labor market outcomes.

Taste-based models differ in whose prejudiced taste they emphasize, so that models of employer discrimination formalize the idea by positing that employers maximize a utility function that is monetary profits less a 'cost' of employing members of the other group. Thus, prejudiced employers indulge their taste for discrimination at the cost of profits. Other

variants of the same idea emphasize the prejudiced tastes of co-workers (who have a taste for not working with minority group members), or customers (who may not wish to be served by minorities).

Depending on whose prejudiced tastes are being emphasized, taste-based models may have predictions about the relationship between the degree of gaps between majority- and minority-group outcomes and the nature of the industry and job function being studied, and Bertrand and Mullainathan (2004) point to the lack of job function/industry variation in the racial callback gaps in their study as evidence against thinking of their findings in a taste-based framework. The fact that we see some evidence of discrimination in the case of call-center jobs (which are, after all, customer-service jobs), and not in the case of software engineering jobs is not, however, plausibly interpretable as evidence of customer-taste-based discrimination, because our call-center jobs are remote, or outsourced, customer-service jobs where employees interact over the phone and not in person with people in either the UK, Australia, or US, who may well have strong prejudices against having to speak to Indian call-center agents, but are unlikely to have strong preferences (or even any knowledge) vis-a-vis the caste or religious background of those they speak to. In any case, it is well-documented that Indian call-center employees are taught to adopt European/American-sounding phone names in order to mask their origins, so that even if customers had the necessary cultural sophistication required to discern caste background from last names, they would be unable to do so. In a sense, therefore, the jobs for which we find evidence of discrimination against OBCs and SCs are those where the customer has the least actual knowledge about the employee s/he is interacting with on the phone. An argument could perhaps be made that the bulk of the clients of most software companies in India are US- or Europe-based firms who may have a large number of Indian-origin employees, so that if these people have caste/religious prejudices, this may affect the hiring of people in India if software firms in India respond to the prejudices of their end clients. However, note that the software jobs are precisely the ones where we find no evidence of significant differential treatment by caste, and where the

point estimates of callback rates are actually higher for Scheduled Castes and Muslims than upper castes. An explanation of our results based on customer or client prejudices does not therefore seem tenable.

We do not, however, know what drives employer tastes or indeed have much information about employers. However, models of employer-taste-based discrimination would predict that groups against which employers have strong prejudices would receive greater returns to resume quality, since the cost of indulging the taste for discrimination would increase as minority candidates became more qualified or better fits for the job advertised. In the case of Muslims, SCs and STs (but not OBCs), this is in fact what we find (see Section 2.5.5 above), so that this is a feasible interpretation of what we find. However, it is difficult to reconcile this explanation with the fact that candidates with low-quality resumes in all caste/religion cells have more-or-less identical callback rates. If we truly believed that employers were prejudiced against SCs and Muslims, and found it more difficult to indulge this taste for discrimination as candidates from these groups became better qualified, we would expect the callback rates for SC/Muslim/ST candidates with low-quality resumes to be lower than the callback rates for Upper-caste candidates with low-quality resumes, which we do not find to be the case.

Theories of statistical discrimination, which constitute the bulk of the theoretical research into discrimination, have as their basic premise that firms have limited information about the skills (and possibly other attributes, such as turnover propensity) of applicants, and thus have an incentive to use observable characteristics of applicants such as gender, race or ethnicity to discriminate between workers, if these characteristics are correlated with worker performance, controlling for all information that firms have about workers (Altonji and Blank 1999:3180). If this is the case, as Bertrand and Mullainathan (2004) point out, groups that are statistically discriminated against should have higher returns to having better resumes, since a better resume should cause the potential employer to update his beliefs about such a candidate more than he would in the case of a candidate from a non-discriminated (in our case, upper-caste) group. Also, as Bertrand and Mullainathan argue, the level of statistical discrimination

could vary considerably across occupations if the various factors that affect it, such as the verifiability of skills, the importance of unobservable skills, the observability of qualifications, the precision of observable skills, and the ease of performance measurement vary across occupations as well. This idea is explored further in what follows, in which we argue that thinking about the differences in the skill requirements of our two job categories – software and call-center – and the relative ease or difficulty of conveying useful information about candidate quality through resumes suggests that a statistical discrimination interpretation of some of the results here may be appropriate.

Imagine that potential employers believe that SC candidates are less productive on average than upper caste candidates with the same resume. In the case of call-center jobs, quality along the dimensions that the employer cares about may be more difficult to convey through a resume (in fact, this is why we chose not to attempt a resume quality manipulation in the case of call-center resumes), so that the prior beliefs about the productivity of different groups is reflected in eventual callback rates. However, in the case of software jobs, a specific set of skills are required, and formal qualifications or previous programming project experience is relatively easily used to convey quality. If this is so, then we should see a bigger benefit to having a better resume for SC candidates than we do for upper-caste candidates, and this is indeed the case. Thus, the callback rates for software and call-center jobs for SCs and UCs, seen together with the evidence on resume quality support a statistical discrimination interpretation in the case of SCs versus upper caste candidates.

Statistical discrimination may also explain why we see much smaller differences by caste in callback rates for software jobs (where even the low-quality resumes may convey considerable information about candidate quality) than for call-center jobs as well as the finding (see Table 6) that OBCs and SCs with low-quality software resumes do exactly as well as upper-castes with low-quality software resumes. If employers have lower priors about people from SC or OBC backgrounds, even seeing a low-quality software resume (which, after all, is still the resume of a person with considerable programming and technical skills) may cause employers

to update their beliefs about the non-upper-caste candidates more than they would for an upper-caste candidate, about whom they had higher prior beliefs. This would then explain why the callback rates for low-quality software resumes are similar for upper-castes and other caste groups: perhaps the callback rates for low-quality resumes already incorporate some updating of employers' beliefs that disproportionately helps SCs and OBCs. A way to test this might be to use even lower-quality – perhaps genuinely unqualified – resumes for software jobs, and see whether upper-caste candidates with such resumes get called back significantly more often than OBCs and SCs. The best that can be done in the present experiment is to point to the results for call-center jobs as indirect support for this interpretation: where everyone has very basic qualifications, upper castes do in fact do better than SCs and OBCs.

However, the statistical discrimination interpretation fails to completely explain the patterns we uncover in the case of OBCs. OBCs are by far the least likely to be called back for call-center jobs, but OBC applicants to software positions see no benefit from having better resumes. This is similar, if more extreme, than what Bertrand and Mullainathan find in the case of African Americans in the US, who have lower returns to skill than Whites. If statistical discrimination were behind the low callback rates for OBCs relative to upper castes in the call-center industry, then we would expect OBCs to benefit more, not less (in fact, not at all) from better resume quality in the software case. To return to the interpretation in terms of low-quality resume callbacks incorporating an unmeasured update about the quality of candidates which causes bigger updates in beliefs for OBCs than for upper castes, it is not clear why employers would update their beliefs in a manner consistent with statistical discrimination theories when they see a low-quality resume, but fail to update further for OBCs when they see an OBC candidate with a high-quality resume.

A second set of statistical discrimination models focus on the differences in the 'precision of information that employers have about individual productivity' (Altonji and Blank 1999: 3181). For example, the true productivity of a specified group of workers may be difficult for firms to discern, because (for example) of cultural differences. This may lead to lower

expected productivity for the groups about whom the firm is more uncertain (see Aigner and Cain 1977), and the wages of the minority-group workers may be less responsive to performance because firms have more difficulty 'seeing' their productivity' (Altonji and Blank 1999: 3181). However, given that we use the same resume templates for OBCs and the other caste categories, it is difficult to see how the same credentials, certificates, college grades, etc., could be less informative for OBCs than for other caste/religious groups.

2.7 Conclusion

The results presented here present a relatively nuanced picture of the status of caste in the workplace in new-economy companies in Delhi. It has been argued above that most of our findings make sense when interpreted in the light of theories of statistical discrimination that emphasize the different prior beliefs of employers about the unobservable skills of candidates from different caste groups. Candidates from OBC, ST or SC backgrounds seem to be at a substantial disadvantage in applying for jobs where soft skills of the sort that may be relatively hard to signal using formal qualifications are a key part of what employers seek, but this disadvantage seems to disappear when the jobs being applied for require harder skills, for which acquiring credible certifications may be easier and more straightforward. Candidates who are Muslim seem to face no systematic disadvantages, at least at the callback stage. Taken at face value, these results imply that training and credible skill certification may be crucial to reducing gaps in job opportunities between upper castes and historically disadvantaged groups such as SCs and OBCs in the private sector in India.

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Table 2.1: Job Requirements

	All	Software	Call_Center
Requires Previous Job Experience	0.86	0.97	0.64
Mean Yrs Experience Requirement Exp Required>0	3.88	3.99	2.54
Mean Minimum Experience Required Exp Required>0	2.44	2.59	0.56
Mean Maximum Experience Required Exp Required>0	5.20	5.38	2.81
Btech/BE Mentioned in Qualifications Required	0.34	0.41	0.00
MCA Mentioned in Qualifications Required	0.24	0.29	0.00
Mtech/ME Mentioned in Qualifications Required	0.05	0.06	0.00
Mentions a formal Computer Qualification	0.03	0.03	0.00
Requires Programming Skills			
Accepts non-Engineering graduates	0.17	0.05	0.68
Mentions College Quality	0.02	0.02	0.00
Mentions College Grades	0.02	0.02	0.00
	0.83	1.00	0.00
No Formal Educational Requirements mentioned	0.47	0.51	0.32
Located in Delhi/Around	0.83	0.80	0.98

Table 2.2a: Mean Callback Rates by Caste: Upper Caste vs Scheduled Caste

	Upper Caste	Scheduled Caste	Ratio UC:SC	Difference (p-value)
<u>Software Jobs</u>				
M+F	4.79 [459]	6.02 [465]	0.80	-1.23 [0.4085]
Male	4.35 [253]	6.61 [257]	0.66	-2.27 [0.2625]
Female	5.34 [206]	5.29 [208]	1.01	0.05 [0.9819]
<u>CallCenter Jobs</u>				
M+F	23.15 [108]	16.67 [108]	1.39	6.48 [0.2331]
Males	23.73 [59]	11.86 [59]	2.00	11.87 [0.0919]
Females	22.45 [49]	22.45 [49]	1.00	0.00 [1.00]

Notes:

1. The table reports, for Software and Call Centre jobs, respectively, the callback rates for applicants with an Upper Caste surname (Column 1) and a Scheduled Caste surname (Column 2). Column 3 reports the ratio of these callback rates, and Column 4 the difference in callback rates
2. The number in brackets is the total number of resumes sent in that cell
3. Column 4 also reports p-values from a test of proportions with the Null of equal callback rates

Table 2.2b: Mean Callback Rates: Upper Caste vs Other Backward Caste

	Upper Caste	Other Backward Caste	Ratio UC:OBC	Difference (p-value)
<u>Software Jobs</u>				
M+F	4.64 [323]	4.28 [327]	1.08	0.36 [0.8241]
Male	4.35 [161]	4.27 [164]	1.02	0.08 [0.9717]
Female	4.94 [162]	4.29 [163]	1.15	0.64 [0.78]
<u>CallCenter Jobs</u>				
M+F	27.42 [62]	14.52 [62]	1.89	12.90 [0.0777]
Males	29.03 [31]	19.35 [31]	1.50	9.68 [0.3735]
Females	25.81 [31]	9.68 [31]	2.67	16.13 [0.0965]

Notes:

1. The table reports, for Software and Call Centre jobs, respectively, the callback rates for applicants with an Upper Caste surname (Column 1) and an OBC surname (Column 2). Column 3 reports the ratio of these callback rates, and Column 4 the difference in callback rates
2. The number in brackets is the total number of resumes sent in that cell
3. Column 4 also reports p-values from a test of proportions with the Null of equal callback rates
4. The sample is all jobs to which both UC and OBC applicants applied

Table 2.2c: Mean Callback Rates: Upper Caste vs Muslims

	Upper Caste	Muslim	Ratio UC:M	Difference (p- value)
<u>Software Jobs</u>				
M+F	5.26 [418]	5.78 [415]	0.91	-0.52 [0.7424]
Male	4.72 [233]	6.09 [230]	0.78	-1.37 [0.5143]
Female	5.95 [185]	5.41 [185]	1.10	0.54 [0.8225]
<u>CallCenter Jobs</u>				
M+F	21.88 [96]	20.83 [96]	1.05	1.04 [0.8591]
Males	22.64 [53]	22.64 [53]	1.00	0.00 [1.000]
Females	20.93 [43]	18.60 [43]	1.13	2.33 [0.7862]

Notes:

1. The table reports, for Software and Call Centre jobs, respectively, the callback rates for applicants with an Upper Caste surname (Column 1) and a Muslim surname (Column 2). Column 3 reports the ratio of these callback rates, and Column 4 the difference in callback rates
2. The number in brackets is the total number of resumes sent in that cell
3. Column 4 also reports p-values from a test of proportions with the Null of equal callback rates
4. The sample is all jobs to which both Upper-Caste and Muslim resumes were sent

Table 2.3: Regressions with Job Fixed Effects, Software Jobs

Dependent Variable: Callback Dummy

	I	II
Scheduled Caste	0.0087	0.0089
[SE]	(0.0108)	(0.0107)
t-ratio	0.81	0.83
OBC	-0.0045	-0.0047
[SE]	(0.0121)	(0.0121)
t-ratio	-0.37	-0.39
Scheduled Tribe	0.0026	0.0025
[SE]	(0.0112)	(0.0112)
t-ratio	0.23	0.23
Muslim	0.0064	0.0063
[SE]	(0.0112)	(0.0112)
t-ratio	0.57	0.57
High Quality CV	—	0.0255***
[SE]	—	(0.0072)
t-ratio	—	3.50
Female Dummy	Yes	Yes
Address Type Dummy	Yes	Yes
No. of Observations	2083	2083

Notes:

Sample: All resumes sent in response to Software ads, excluding caste-neutral category

RHS variables of interest are dummies for different categories of non-upper-caste surnames

Column II adds a dummy for the type of resume template used

All regressions are OLS with job fixed effects and have dummies for gender and address type

Omitted category is Upper-Caste, all coefficients measure difference in callbacks with this category

Table 2.4: Regressions with Job Fixed Effects, Call-Center Jobs

Dependent Variable: Callback Dummy

	I	II
Scheduled Caste	-0.0652	-0.0611
[SE]	(0.0432)	(0.0435)
t-ratio	-1.51	-1.41
OBC	-0.0996*	-0.0945*
[SE]	(0.0524)	(0.0527)
t-ratio	-1.90	-1.79
Scheduled Tribe	-0.0727	-0.0745*
[SE]	(0.0450)	(0.0453)
t-ratio	-1.62	-1.64
Muslim	-0.0209	-0.0169
[SE]	(0.045)	(0.0452)
t-ratio	-0.46	-0.38
Resume Dummies	No	Yes
Female Dummy	Yes	Yes
Address Type Dummy	Yes	Yes
No. of Observations	470	470

Notes

Sample: Resumes sent in response to Call-Center ads, excluding 'Neutral' names

RHS variables of interest are dummies for different categories of non-upper-caste surnames

Column II adds dummies for the resume template used

All regressions are OLS with job fixed effects and have dummies for gender and address type

Omitted category is Upper-Caste, all coefficients measure difference in callbacks with this category

Table 2.5a: Distribution of Callbacks by Employment Ad, CallCenter Jobs
Panel A: Upper-Caste versus Scheduled Caste

<u>Equal Treatment</u>	<u>0 UC, 0 SC</u>	<u>1 UC, 1 SC</u>	<u>2UC, 2 SC</u>
70.37 [38]	57.41 [31]	7.41 [4]	5.56 [3]
<u>Upper-Caste Favored</u>	<u>1 UC, 0 SC</u>	<u>2 UC, 0 SC</u>	<u>2 UC, 1 SC</u>
16.67 [9]	5.56 [3]	9.26 [5]	1.85 [1]
<u>Scheduled-Caste Favored</u>	<u>1 SC, 0 UC</u>	<u>2 SC, 0 UC</u>	<u>2 SC, 1 UC</u>
12.97 [7]	12.96 [7]	0.00 [0]	0.00 [0]

p-value from test of difference in proportion that favor UC versus fraction that favor SC: 0.587

Panel B: Upper-Caste versus Other Backward Caste

<u>Equal Treatment</u>	<u>0 UC, 0 OBC</u>	<u>1 UC, 1 OBC</u>	<u>2UC, 2 OBC</u>
64.52 [20]	58.06 [18]	3.23 [1]	3.23 [1]
<u>Upper-Caste Favored</u>	<u>1 UC, 0 OBC</u>	<u>2 UC, 0 OBC</u>	<u>2 UC, 1 OBC</u>
29.03 [9]	12.90 [4]	3.23 [1]	12.90 [4]
<u>OBC Favored</u>	<u>1 OBC, 0 UC</u>	<u>2 OBC, 0 UC</u>	<u>2 OBC, 1 UC</u>
6.45 [2]	6.45 [2]	0.00 [0]	0.00 [0]

p-value from test of difference in proportions between fraction favoring UC vs favoring OBC: 0.02

Table 2.5b: Distribution of Callbacks by Employment Ad, Software Jobs

Panel A: Upper-Caste versus Scheduled Caste

<u>Equal Treatment</u>	<u>0 UC, 0 SC</u>	<u>1 UC, 1 SC</u>	<u>2UC, 2 SC</u>
91.32 [242]	88.68 [235]	1.51 [4]	1.13 [3]
<u>Upper-Caste Favored</u>	<u>1 UC, 0 SC</u>	<u>2 UC, 0 SC</u>	<u>2 UC, 1 SC</u>
3.40 [9]	3.02 [8]	0.00 [0]	0.38 [1]
<u>Scheduled-Caste Favored</u>	<u>1 SC, 0 UC</u>	<u>2 SC, 0 UC</u>	<u>2 SC, 1 UC</u>
5.28 [14]	4.15 [11]	0.00 [0]	1.13 [3]

p-value from test of difference in proportion that favor UC versus fraction that favor SC: 0.2882

Panel B: Upper-Caste versus Other Backward Caste

<u>Equal Treatment</u>	<u>0 UC, 0 OBC</u>	<u>1 UC, 1 OBC</u>	<u>2UC, 2 OBC</u>
95.85 [254]	93.96 [249]	0.75 [2]	1.13 [3]
<u>Upper-Caste Favored</u>	<u>1 UC, 0 OBC</u>	<u>2 UC, 0 OBC</u>	<u>2 UC, 1 OBC</u>
2.64 [7]	2.26 [6]	0.00 [0]	0.38 [1]
<u>OBC Favored</u>	<u>1 OBC, 0 UC</u>	<u>2 OBC, 0 UC</u>	<u>2 OBC, 1 UC</u>
1.51 [4]	1.13 [3]	0.38 [1]	0.00 [0]

p-value from test of difference in proportion that favor UC versus fraction that favor OBC: 0.3615

Table 2.7: Mean Callback Rates by Caste and Resume Quality (H or L, subjective classification) Software Jobs

	<u>High</u>	<u>Low</u>	<u>Ratio</u>	<u>Difference</u> <u>(p-value)</u>
All	6.38 [1253]	3.98 [1156]	1.60	2.41 [0.0082]
UC	5.81 [241]	3.67 [218]	1.58	2.14 [0.2838]
SC	8.20 [244]	3.62 [221]	2.26	4.58 [0.0382]
OBC	4.14 [169]	4.43 [158]	0.93	-0.29 [0.897]
M	7.34 [218]	4.06 [197]	1.81	3.28 [0.1529]
ST	6.45 [217]	3.50 [200]	1.84	2.95 [0.1687]
N	5.49 [164]	4.94 [163]	1.11	0.55 [0.832]
Men	6.13 [701]	4.26 [658]	1.44	1.88 [0.1216]
Women	7.09 [522]	3.61 [498]	1.96	3.47 0.0139

Notes:

- 1 Column 1 reports callback rates for 'High-Quality' Software resumes
- 2 Column 2 reports callback rates for 'Low-Quality' Software resumes
- 3 Column 3 reports the ratio of Column 1:Column 2
- 4 Column 4 reports the difference, and the p-value from a test of proportions with the Null of equality between the callbacks in Cols 1&2
- 5 Numbers in brackets in Cols 1 and 2 are the total number of resumes sent in that cell

Table 2.8: Effect of Subjective Resume Quality on Likelihood of Callback, Software Jobs, Job Fixed Effects
Dependent Variable: Callback Dummy

Sample	All CVs	Upper Caste	SC	OBC	Muslim	ST	Neutral
High Quality	0.0225***	0.0289*	0.0540***	0.0000	0.0298*	0.0258	0.0075
(SE)	0.0067	0.0178	0.0207	0.0164	0.0170	0.0182	0.0195
z-ratio	3.37	1.62	2.61	0	1.76	1.42	0.39
High Address	0.9940	-0.0905	-0.0363	0.0000	-0.0127	0.0155	dropped
(SE)	-0.0130	0.0736	0.1907	0.1145	0.1551	0.1036	dropped
z-ratio	0.013091	-1.23	-0.19	0	-0.08	0.15	dropped
N	2409	459	465	327	415	417	326

Notes: Each column gives the result of a regression with firm fixed effects where the Callback dummy is regressed on a dummy for a high-quality resume and a 'U'-type residential address.

Table 2.9: Callbacks by Last Name, Call-Center Jobs

Surname	Category	Callback Rate, CC Jobs	Above/Bel ow Mean
<u>Upper-Caste</u>			
Joshi		15.38	Below
Aggarwal		20.00	Above
Gupta		23.08	Above
Bhatia		25.71	Above
Chaturvedi		33.33	Above
Arora		33.33	Above
<u>OBC</u>			
Teli		5.88	Below
Gujjar		14.29	Below
Lohar		17.65	Below
Yadav		21.43	Above
<u>SC</u>			
Kori		5.56	Below
Mandal		13.64	Below
Jatav		14.29	Below
Manjhi		16.67	Below
Paswan		20.00	Above
Pasi		27.78	Above
<u>Muslim</u>			
Syed		11.11	Below
Siddiqui		12.50	Below
Rizvi		16.67	Below
Imam		16.67	Below
Zaidi		23.53	Above
Khan		30.77	Above
Ahmed		33.33	Above
<u>ST</u>			
Meena		7.69	Below
Oraon		11.54	Below
Toppo		13.64	Below
Munda		22.86	Above
<u>Neutral</u>			
Kumar		9.68	Below
Singh		16.67	Below
Lal		24.00	Above

The mean callback rate for CallCenter jobs in the experiment is 18.23.

Chapter 3

Gender and Promotions in India's Civil Service: An Empirical Analysis of (Women's) Careers in the Indian Administrative Service, 1971-2004

Summary 3 *Is there evidence of differential treatment by gender in India's Civil Service? To answer this question, this paper follows the careers of 1457 civil servants in India from the time they were recruited to the time they reach the fifth of seven levels within the Civil Service hierarchy. I compile and use a newly-collected data set made up of employment records for all entrants into the Indian Administrative Service, or IAS, between the years 1971 and 1984, who were recruited through an annual competitive examination. Using the individual's rank at entry, which is based on his/her performance in a series of examinations and an interview, as a measure of initial quality, I compare the career progress of men and women in each quartile of the rank distribution for each entering cohort, and find that women in the lowest rank quartile take significantly longer than similarly-ranked men (as well as than higher-ranked men and women) to be promoted to level 5 of the civil service hierarchy, and that this differential treatment persists when I control for the frequency of transfers at lower*

levels, which anecdotal evidence suggests, and the data confirms, as being negatively correlated with the speed of subsequent promotion. I argue that the results here are evidence of statistical discrimination against women in the Indian civil service.

3.1 Introduction

Economists and sociologists have become increasingly interested in the issues surrounding women's experiences in the workforce as women in many countries have entered the workforce, particularly many professions that were earlier male-dominated, in ever-larger numbers over the last 50 years. Much scholarly and popular discussion has focused on whether women face systematic disadvantages in the workplace relative to men, whether it be in terms of pay, promotions, or job assignments. In the case of India, women have entered white-collar professions in greater numbers than ever before since the 1950s, but while several studies provide qualitative descriptions of women's experiences in the workforce (see for example Liddle and Joshi 1989), relatively little formal empirical work exists that documents their experiences in careers and fields that were till recently the nearly complete preserve of men.

One such profession is the bureaucracy, which for much of India's recent history has been a particularly prestigious profession because of the active role of the state in many spheres of the economy. The present Civil Service system was set up soon after Independence, but women were virtually unrepresented among the elite corps of national-level civil servants in the early years. However, women have entered the bureaucracy in increasing numbers over the last thirty years (see Section 3.5.3 below). As women have become more visible in this profession, there has been considerable popular discussion of the perceived disadvantages faced by women in the Civil Service, with journalistic discussion focusing on the relatively few women who have risen to the most prestigious positions at the top of the bureaucracy (Pande 2000, Tikku 2007). Some have argued, based largely on anecdotal evidence of particular women officers who are considered to have been qualified to take on top assignments within the bureaucracy which have then gone to men, that women are systematically discriminated against by a male-dominated senior bureaucracy, which denies qualified women the opportunity to rise to the highest levels in the bureaucracy (Chowdhary 2006). Others argue that the opposite is true: in its zeal to showcase the sensitivity of the government to the perceived gender disparity in institutions such as the bureaucracy, women civil servants are actually given preferential

treatment relative to equally able men (or, at least, that promotion policies are better in the public than the private sector: see Kumar et al. 1999). In the absence of systematic empirical evidence, however, it is difficult to be more definite about these issues, and it is this gap which this paper seeks to fill. By carrying out a systematic analysis of approximately 20 years of data on the careers of the 1,457 civil servants in the highest echelons of India's civil service, the Indian Administrative Service (IAS) who were recruited to the IAS between 1971 and 1984, I seek in this paper to uncover the extent and nature of differential treatment by gender in terms of promotions within India's Civil Service, in order to understand whether women in this profession are indeed treated differently than their male colleagues, and if so, what the degree of such differential treatment is.

I analyze a dataset incorporating the career records of each serving IAS officer belonging to one of 13 cohorts of civil servants who entered the national bureaucracy between 1971 and 1984 through a series of competitive examinations. Because of the fairly clearly codified hierarchical structure of careers within India's bureaucracy, I am able to pinpoint precisely the times as which each individual in the dataset was promoted from one hierarchical level to another, to see whether any significant differences exist by gender, and how these differences vary with the position of women in distribution of the initial ability measure, which is based on the rank of the individual in the entrance tests/interview on which entry into the IAS is based (see Section 4 for details of the procedure).

I find no evidence that women on average take longer to be promoted from one level of the bureaucratic hierarchy to another, at least for promotions upto the fifth of seven hierarchical levels in the Indian bureaucracy. However, I find evidence that women who were ranked in the bottom quartile of the rank distribution in their entering cohort took significantly longer than men in the same rank quartile to be promoted, and some (albeit statistically weaker) evidence that women in second-to-highest rank quartile progress faster than correspondingly-ranked men. This runs counter to the idea that women in the workplace face what has come to be described as a 'glass ceiling', whereby disadvantages accrue to women 'at the top', which is

usually taken to mean that disadvantages accrue as women progress up the career ladder, but could also be interpreted as meaning that higher-skilled women face greater disadvantages than lower-skilled ones. I argue that my findings are consistent with theories of statistical discrimination, where discrimination is most marked for those who are least able to provide evidence that causes employers (or, in this case, superiors) to update their perceptions about the ability of individuals from different ethnic, race, or gender groups. However, since I am unable to explicitly control for on-the-job performance, intrinsic motivation, and possible child-rearing and pregnancy-related issues in a satisfactory manner, it is still possible to offer alternative explanations for the promotion patterns that I see: however, I shall argue that the statistical discrimination explanation is the most plausible one.

The plan of the rest of the paper is as follows. Section 3.2 provides additional motivation for studying the issue of differential treatment by gender in this particular context. Section 3.3 provides a brief overview of the literature relevant to this issue, focusing in particular on evidence from other settings on gender gaps in promotions and other measures of professional or career advancement. Section 3.4 provides background information on the setting of this paper, with emphasis on the Indian Administrative Service and the modalities of recruitment into it, as well as on women's participation and experience in the workforce in India more generally in order to put the paper in context. Section 3.5 describes the data used in this paper and summarizes the observed structure of careers within the Indian bureaucracy in order to motivate the particular measures of career progress used later. Section 3.6 describes the empirical strategy adopted. The results are summarized in Section 3.7, and Section 3.8 interprets the findings in the light of theories of discrimination. Section 3.9 concludes.

3.2 Motivation

There has been considerable discussion in India about the possible reasons, including discrimination in promotions, why the gender composition of top management and parts of the civil services remains skewed in favor of men (see Chowdhary 2006, Tikku 2007) though no

systematic study of promotions to top management in either public or private sectors exists. Further, while there are at present no affirmative action policies specifically targeted at women in the workplace, there have been periodic demands for such measures to be initiated. More information about the patterns of entry into and promotion in various professions by gender would be useful in enabling policy-makers to make more informed policy choices in this regard. This paper seeks to provide an empirical foundation for this discussion in the context of the bureaucracy in India.

In the absence of reliable data about the gender mix of those who comprise the potential entry pool into the professions, as well as limited information about the composition of the workforce at different levels of seniority, the various competing hypotheses for the perceived under-representation of women at the senior-most levels of the bureaucracy - including supply-side issues, the correlation of career choice with gender, and discrimination in hiring or promotions - are difficult to distinguish between. At the same time, making inferences about the possible role of gender discrimination in determining the composition of the top tiers of various professions is difficult if the analysis is based on broad survey data, which encompasses men and women with very different levels of training, education and skills in a variety of different occupations. Several studies have therefore attempted to understand the issue of gender in the workplace in the context of particular professions or even specific firms, which has the advantage over broader studies of studying a relatively homogeneous group of individuals (see Section 3.3.2). This paper takes a similar approach by focusing on careers within a particular profession, for which entry is through a set of public examinations, so that the small pool of entrants each year are known to have met certain minimum entry standards in terms of their formal qualifications and skills for the job.

The setting of this paper and the kind of data used has both advantages and disadvantages. On the one hand, it is rare to be able to access detailed career information about people within a particular organization, over the length of time that the data used here cover: most comparable work must restrict itself to using snapshots at a particular point of time, or

retrospective interviews, with their scope for biased recollections (some of these are discussed in Section 3.3.2 below). In this sense, being able to follow the careers of 1,457 individuals comprising 13 entry cohorts in the same 'organization' is to be able to take an unusually complete look at a set of careers. Further, the nature of recruitment into the Civil Service through a series of public examinations (see above and Section 3.4.1.1 for more detail) allows me to use the rank at entry of each individual relative to others in his/her entering cohort of officers as a measure of quality at the time of entry, allowing for comparisons to be made between individuals who not only had similar paper qualifications and entered the Civil Service together after having met the minimum entrance requirements, but who performed similarly in the entry tests, i.e. who 'looked similar' at the time of entry. This is a particularly attractive and unusual feature of the data that are used here.

On the other hand, it could be argued that looking at the careers of an elite corps of civil servants is limited in its scope, because any findings at this level are unlikely to be representative of careers in the economy as a whole, or even in the government bureaucracy in general. Further, the nature of bureaucratic job assignments and pay structures is such that it precludes analysis of some of the crucial questions that economists studying gender in the workplace are interested in, such as whether men and women doing the same jobs are paid equally, since pay in this setting is a wholly predictable function of hierarchical rank and seniority.

While acknowledging the limitations imposed by the setting, I would argue that the analysis carried out here is of interest both because of the attention that has been focused on women's careers in the Indian civil service, but also because it may be useful to think of whatever emerges from the analysis of these 'elite' careers as putting a lower bound on the gender-discrimination-related issues women may face in less elite segments of the Indian workforce.

3.3 Literature Review

3.3.1 Empirical Literature on Gender Discrimination in the Labor Market

Altonji and Blank (1999) define labor market discrimination as 'a situation in which persons who provide labor market services and who are equally productive in a physical or material sense are treated unequally in a way that is related to an observable characteristic such as race, ethnicity, or gender'. In keeping with this, the empirical literature on gender discrimination in the workplace has as its starting point the well-documented existence of a gender wage gap in the US and other developed countries, though 'wage gaps are only the most visible form of differences in labor market outcomes by race and gender. Substantial differences in labor force participation, unemployment rates, occupational location, non-wage compensation, job characteristics and job mobility all exist both by race and sex' (Altonji and Blank 1999: 3145). The literature takes several approaches to understanding how these differences arise, persist, and change over time, and to what extent they can be attributed to discrimination, including decomposition-based approaches to explaining wage gaps (for example Blau and Kahn 1997 and a host of others), quasi-experimental approaches (such as Goldin and Rouse 2000), and experimental approaches such as Bertrand and Mullainathan (2004). While experimental approaches provide relatively clean evidence on the outcomes they are able to measure, these outcomes are relatively crude: callbacks in the case of resume audits, and hiring in the case of audit studies (see Bertand and Mullainathan 2004: 11). It is difficult to get such evidence on labor market outcomes beyond the hiring stage, such as promotion, wages, job assignment, training opportunities, etc., which are, however, studied extensively in a large literature based on non-experimental data.

3.3.2 Empirical Literature on Gender Gaps in Career Progress

Women's progress within their career relative to men has been studied in the literature on glass ceilings (a metaphor that alludes to growing difficulties for women when moving up the career ladder; see Bihagen and Ohls 2006) and sticky floors (which refers to the opposite

phenomenon, when gender differences are more marked at the early stages of a person's career), which includes both papers that draw inferences from the differences in wage gaps at different parts of the wage distribution as well a smaller set of papers which directly look at women's promotion prospects and rates relative to those of men. While most of the papers in this literature find that there is a gender gap in career outcomes, the findings about the specific relationship between their position in the occupational hierarchy, the gender composition of the workforce, and such relative (dis)advantages vary.

Papers using survey data on incomes measure wage gaps at different parts of the wage/occupational distribution as a way of understanding how wage gaps relate to people's position in the distribution of income in the absence of direct evidence on promotions, job assignments etc. Kee (2005) uses data from Australian Household Income and Labour Dynamics Survey, and finds that women earn less than comparably qualified men at all levels in the public sector. However, Albrecht, Bjorklund and Vroman (2003) argue in favor of a glass ceiling effect, based on their finding that the gender wage gap in Sweden increases throughout the wage distribution and accelerates in its upper tail; Kee (2005) finds similar results for the private sector in Australia. However, it is difficult to interpret the residual from these studies as clear evidence of discrimination on the part of employers, because as Bertrand and Mullainathan (2004) point out, 'standard labor force surveys do not contain all the characteristics that employers observe while hiring, promoting, or setting wages... as a result, any measured differences in outcomes could be attributed to unobservable (to the researcher) factors'. Nonetheless, this approach is useful both as a way of tracking changes in wage differentials and how they are affected by differences in levels of pre-labor market human capital (education/skills) differential and of pinpointing hypotheses for studies that directly measure career progress to consider.

A subset of papers in this literature study gender differences in promotion directly. Those that do so in the context of a representative sample of individuals drawn from a variety of occupations and sectors include Bihagen and Ohls (2006), who use panel data from Sweden for both public and private sector employees and find some evidence of promotion disadvantages

accruing to women, but also that these disadvantages attenuate as women reach mid-level ranks (with some slight evidence of accrual beyond this point) in the hierarchy. Kramer and Lambert (2000) use a random sample of US individuals to study the gender differences in the probability of being promoted to a supervisory position, and find that women make the supervisory grade significantly later than men. Maume (1999) studies the career transitions of individuals in the PSID, and finds that men are significantly more likely than women to receive a 'wage promotion' (a discrete wage increment of at least 15 per cent, which is argued to be related to on-the-job promotion).

Studies that look within a particular sector or industry have the advantage of being able to use the structure of careers within the sector or industry they study to identify important promotion points or grades, as well as using data on a relatively less heterogeneous group of individuals than those discussed above. Among these, Di Prete and Soule (1988) study the careers of white-collar federal government employees in the US over the period 1972-77. They find significant disadvantages for women in promotion from the lower to upper-tier grades, with no disadvantage at upper levels of the hierarchy, even controlling for personal attributes and organizational characteristics. Powell and Butterfield (1997) study data on promotions to top management in a large, cabinet-level federal department within the US Civil Service over a five-year period, and find that applicant gender by itself did not have a significant effect on selection decisions. Spurr (1990) studies the probability that men and women employed in 139 large law firms who were hired between 1969 and 1973 were promoted to partner by 1987, and finds that women were about half as likely to make partner as men, and these differences persist despite controlling for measures of educational quality, honors, etc. They also present evidence that they argue means that controlling for on-the-job productivity, women in their sample are held to a higher promotion standard than men. In a similar study of promotions in academic medicine, Tesch, Wood, Helwing and Nattinger (1995) found that women in their data, which was based on a retrospective survey of doctors who began their careers at the same time and at the same institutions, were significantly less likely than men

to have achieved either Associate or Full Professor rank, even controlling for number of hours reported worked per week, the number of children, and quantity of academic publications.

3.3.3 Literature and Data on Women's Participation in the Labor Force in India

The existing literature and basic statistics on women's labor force in India are discussed here in order to provide a context for what follows.

Female labor force participation in India is considerably lower than that for males. The 2001 Census reports women's labor force participation as 25.6 per cent, compared to 48.32 per cent for men (Census of India 2001). Women workers are also disproportionately likely to be 'marginal workers' (those who reported working for 6 or less months of the year) : 42.7 per cent of women who were in the workforce were marginal workers, compared to 6.6 per cent of men (Census of India 2001).

Rural female labor force participation(30.7 per cent) is greater than that for urban females (11.9 per cent), but while 45.68 per cent of rural female workers are marginal workers (see definition above), this is true for only 20.7 per cent of urban working women. The relationship between education and labor-force participation for Indian women has been found to be non-monotonic, so that both illiterate women and those with post-secondary education are more likely to work outside the home than those with intermediate levels of education (Dunlop and Velkoff 1999: 5). There is thus considerable variation by social/educational background in women's labor force participation.

Data on women in managerial/white-collar positions are not readily available, though the broad categories used to classify workers in the Census can be used to get a rough sense of the aggregate numbers. The broad industrial category into which such women fall in the Census was recorded as employing 1.5 per cent of India's women, and where women constituted 24.9 per cent of the workforce (in comparison, 31.6 per cent of all workers in India were women)¹. Madheswaran and Lakshansamy (1996) document the fact that the public sector

¹This category includes the sub-categories Public Administration and Defence, Compulsory Social Security,

employs a larger share of women than the private sector. Kishwar and Vanita (1985) present qualitative evidence based on interviews with working women which suggests that women face continuing wage discrimination when employed. Liddle and Joshi (1986) interviewed a range of professional women and report that two-thirds of professional women they interviewed felt that they had to work harder to receive the same benefits as comparably employed men, and that most of the women they spoke to who did not perceive discrimination worked in fields such as gynecology where there was little male competition.

This paper is closest in spirit to the set of papers discussed in Section 3.2 in that it looks closely at promotion outcomes for women and men with the same job profiles within an organization (thus obviating some of the concerns arising from using data on women's career outcomes in broader settings where individuals in the data may come from a variety of educational backgrounds, have very different skills, and do very different jobs, see 3.3.1 and 3.3.2 above). In addition, the insights of the glass ceiling literature motivate looking separately at career outcomes by skill or qualification level in order to determine whether relatively 'elite' members of the cohort are treated differently as they move up the organizational ladder than less elite members. Finally, this paper also draws upon the insights of a relatively small literature in organizational economics, exemplified by Baker, Gibbs and Holmstrom (1994), which pays close attention to internal hierarchies and job assignments, etc. in studying the 'structure of careers within an organization': while this literature is not explicitly concerned with issues of discrimination, it motivates the way in which I use past promotion and job assignment information to proxy for on-the-job performance.

Education, Health and Social Work, Other Community, Social and Personal Activities, Private Households with Employed Persons, Extra-Territorial Organisations and Bodies, but the Census Advance Tables only provide the aggregate for all these sub-categories together.

3.4 Background

3.4.1 The Indian Administrative Service (IAS)

Members of the Indian Administrative Service (usually referred to by the acronym IAS) are civil servants employed by the Government of India, who together with the officers of the Indian Foreign Service and Indian Police Service, constitute the apex of the Civil Service system in India. The IAS, IPS and IFS are together known as the All-India Services. De facto if not de jure, all the highest administrative positions in the government are filled by senior members of the IAS. IAS officers are allotted on recruitment to a state 'cadre', which determines the state to which they may be seconded at various points in their career, though their employer is always the Central Government. They shuttle between jobs in New Delhi, working directly for the Central Government, and the states, where they may work in the state capital or district headquarters. They perform administrative tasks within the government and may work at different points in their careers as District Magistrates or Collectors, who are in charge of the administration of a district, the level at which local administration in India is organized, or directly in ministries at the Central Government, its agencies, or for the government of the state to which they are assigned. Their role is essentially to oversee the day-to-day administrative work of government at various levels, to implement government policy, and to aid in policy formulation.

Recruitment Process

Officers are recruited into the All-India Services, as well as the Class I Services, which rank below them in the hierarchy of the Civil Service, through an annual series of national competitive examinations conducted by the Union Public Service Commission. The first stage is known as the Preliminary Examination. Over the period covered by this paper, this examination was open to any Indian citizen between the ages of 21 and 26 (29 for members of Scheduled Castes/Tribes, see below; also, the age limit was raised to 30 in 1992) who had a Bachelors degree. The average number of candidates who took the Preliminary Exami-

nation between 1997 and 2003 was 130,000 (UPSC Annual Reports). This round is purely eliminatory in purpose, and the top candidates (typically 12-13 times the number of eventual vacancies) are selected for the next stage, known as the Main examinations. The Main examinations consist of 8 written examinations and an interview, though the first two, in English and another Indian language, are qualifying in nature and do not count towards the candidate's final ranking. The final ranking is based on the remaining 6 examinations and the interview: an essay (200 points), a 'General Studies' examination, (600 points), two examinations each in two subjects of the candidate's choice (300 points each for a total of 1200 points), and the final interview (300 points) for a total of 2300 points. The candidate's cumulative score out of 2300 determines whether or not s/he is selected, and whether or not s/he is assigned to their first choice of service (IAS IPS, or IFS). Those who rank below the cutoff for the All-India Services may be offered positions in the Class I Services. The entering officer's rank in the service is determined by his/her cumulative score out of 2300 in the entrance examination. The rank at entry is thus potentially a useful measure of the new recruit's measured ability at entry relative to his/her peers.

Positive Discrimination Policies: Recruitment of Members of Scheduled Castes/Tribes

While all officers must take the qualifying examination, the selection committee may set the cutoff for recruitment lower for members of historically disadvantaged social groups (the Scheduled Castes and Scheduled Tribes) for whom positive discrimination policies are in place. Candidates from these groups can also take the examination more times, and can be aged upto 35 at the time they sit for the examination (this was 30 until the cohort that entered in 1992, thus covering all cohorts studied here) while for others, the age limit is 30 (and was 26 for the cohorts studied in this paper). In theory, 15 per cent of jobs in the IAS are reserved for members of the Scheduled Castes, and 7.5 per cent for members of the Scheduled Tribes. However, while precise information on the actual functioning of the system of reservations is hard to find in the public realm, what little there is suggests that at least in the 1970s, these quotas were largely unfilled: published data for 1978-79 indicated that

only about one-third of the placed reserved for Scheduled Castes, and *one-seventh* of those reserved for Scheduled Tribes were being filled annually (Government of India 1980).

Finally, although women from the Scheduled Castes/Tribes are, of course, eligible for the quotas in place for members of these groups, no separate reservation policies for women (or religious minorities) are in place although these groups have historically been and continue to be hugely under-represented in the IAS.

3.5 Data

3.5.1 Sources and Contents

The data used in this paper were obtained by collating, person-by-person, the employment records of all IAS officers who were in service as of 2005. These employment records are available from the website of the Ministry of Personnel and Training of the Government of India (Ministry of Personnel 2006). For each person covered in the data, the employment record contains some personal information and career details. The personal information consists of the officer's name, gender, year of recruitment (cohort), date of birth, educational qualifications, the state the person is from (state of domicile), the languages s/he speaks, and his/her mother-tongue. The career details consist of each position the officer has held, the date s/he was appointed to the position and the date on which s/he moved to the next position, the level (referred to as scale) of the position, and where the job was located (which ministry in the Central or State government, and in the case of a district position, the district in which the job was located).

As discussed in Section 3.4.1.1, officers are recruited into the IAS through a series of national competitive examination, so that an officer's rank in his entering cohort is a measure of his or her performance in the recruitment exam/interview relative to the rest of his/her entering cohort. In order to use this information, I merged the ranks of serving IAS officers from Appendix B of the 'Civil List', which is an annual Government publication which lists all serving officers of the government and the positions they held during the year (the

employment records that I use to construct the main dataset is in essence a compilation of the information contained in a series of Civil Lists), and Appendix B lists officers by rank and year of recruitment.

3.5.2 Sample Selection

Although data were available on all cohorts beginning 1971 and ending in 2002, I chose to work with a subset of cohorts, namely all IAS officers who were recruited between the years 1971 and 1984. The reason for this is that this is the largest possible subset of available cohorts for whom at least 20 years of career data were available at the time the data set was compiled. Because progression up the career hierarchy is steady but slow, observing individuals for the length of time that I do by restricting my sample to the cohorts in or before 1984 means that I am able to observe at least three points of promotion for 99.2 per cent of individuals in my data.

To arrive at my final sample, I exclude individuals for whom the data have major gaps. In particular, I am forced to exclude a small number of observations on the grounds of missing start and/or end dates for their first job: absent this data, it becomes impossible for me to construct the variables measuring time in a particular scale, and points of promotion, which are at the core of the analysis I carry out here. For all cohorts of entering officers except those that entered in 1982, this appears unproblematic as it affects 1.2 per cent of the individuals in the data (19 out of 1475²). However, there appear to be large data gaps for the 1982 cohort: for only 40 out of 134 officers in this cohort do we have complete data. I thus exclude the 1982 cohort completely, rather than using the potentially non-random selection of individuals with complete data, which leaves me with 1,457 individuals for 13 years.

Table 3.1 summarizes the size and gender composition of each entering cohort in the data. The average cohort has 112.07 individuals and is 13.5 per cent female³, and the median

²0 observations for the cohorts 1971-75, 1 observation for the 1976, 1977, 1979 and 1983 cohorts, 2 observations in the 1978 cohort, 3 in the 1981 cohort, and 5 observations for the 1980 and 1984 cohorts (out of an average cohort strength of around 110) were dropped.

³In comparison, the 1982 cohort, which was excluded (see the section on Sample Selection above), had 137 individuals, which makes it seem unusually large, until we notice that the cohort size seems to have bene

cohort in the sample has a size of 113 and is 11.7 per cent female. Cohort size is plotted against year in Figure 2, showing a slight upward trend towards the end of the period.

3.5.3 Caste and Gender Composition of the IAS

Women first entered the IAS in 1951, but constituted a tiny fraction (4 per cent) of recruits in the 1950s. While female representation has increased since then, women remain under-represented in the IAS: according to the data used in this paper, 13.5 per cent of the entrants into the IAS between 1971 and 1984 were women (see Table 3.1). Table 3.2 summarizes how women and men do at the entrance stage, as summarized by their place in the rank distribution. Women are less than proportionately likely to be in the bottom quartile of the distribution, and slightly more than proportionately likely to be in the other three quartiles; the opposite obviously holds for men.

As discussed in Section 3.4.1.2 above, 15 per cent of jobs in the IAS are reserved for members of the Scheduled Castes, and 7.5 per cent for members of the Scheduled Tribes. While this is not directly relevant to the subject of this paper, it does affect how we think of the meaning of the entering rank for the lower parts of the rank distribution. This is because, as discussed above, most SC/ST candidates are able to enter the IAS only after a relaxation in the score on the entrance examination required for entry. Thus, the relationship between rank at entry and actual performance on the entrance test may be different for SC/ST candidates than for others. If we knew who among the individuals in our data set were recruited as a part of the policy of positive discrimination, we could exclude them from the analysis, but this data could not be found⁴, nor, as discussed above, do we know how many seats in the IAS were filled by SC/ST individuals although for the cohorts that entered in the 1970s no more than 5 per cent and 1 per cent of recruits are likely to have been from the SC or ST categories, respectively (see Government of India 1980), and these individuals are likely to be concentrated in the lowest quartile of the rank distribution.

growing in the early 1980s.

⁴While this information clearly exists, it is not in the public domain, and efforts to get a list of SC/ST officers from the Government were turned down on grounds of confidentiality.

3.5.4 Hierarchical Levels Within the IAS

Table 3.3 lists 6 of the 7 different hierarchical levels present in the data⁵. Columns 1 and 2 show the levels, though the names by which they are referred to in the data are not always unique. The correspondence between different names for scales, and the levels they represent, was obtained from an official notification (Ministry of Personnel 2000: 3), and verified in correspondence with serving IAS officers. As one might expect in such an explicitly hierarchical setting, the progression up the hierarchy of scales is also almost perfectly systematic, in that people are assigned to one or several jobs of varying lengths within a hierarchical level, before being promoted to the next level. There are a few instances where individuals 'leapfrog' a particular level, though these are not many: this can be seen from Column IV of Table 3.2, which records the number of people who spend 0 years in each level: the only significant instance of skipping seems to be that 54 people in the sample (3.7 per cent of individuals) skip level 4. While we have no way of telling whether there was attrition, the prestige of the profession and anecdotal evidence suggests that exit is likely to have been negligible.

Table 3.2 also lists the minimum, average, and maximum number of years spent by an individual in each of the first five levels of the hierarchy. 99.6 per cent of all individuals in our data begin at Level 1, while the remaining 0.4 per cent begin at Level 2. As mentioned above, progression is slow but almost entirely predictable, with almost everyone beginning at Level 1 and slowly rising up over the time period the data covers till they reach Level 4 or, in some cases, Level 5, with only a small percentage ever skipping a level. The mean times spent at a particular level in the hierarchy map fairly precisely into the the minimum number of years in each level after which the Ministry of Personnel says that a serving officer can hope to be promoted to the next level (Ministry of Personnel 2000: 3-4), at least for Levels 1, 2 and 3.

The time spent in each level seems lower for levels 4 and 5 than the benchmark figures, but this is likely to be because a significant number of the individuals in the dataset were still

⁵The seventh and highest, Secretary, is attained by only 20 people in this dataset, so we do not present any results for this level.

in level 4 at the time the data was collected, so that the people we observe at Level 5 have not completed their full term at that level, and this is true for some fraction of people in Level 4 as well. One quick way to confirm this is to check whether older cohorts are over-represented among those who we observe as having spent some time at Level 5. This is in fact the case, as 100% of the 1971, 1972, and 1973 cohorts have spent some time at Level 5 in our data, as have over 99 per cent of the 1974, 1975 and 1976 cohorts, but for the youngest three cohorts (1981, 1983, and 1984 entrants), the corresponding percentages are 69.4, 54.5, and 38.2 respectively. Alternatively expressed, the youngest three cohorts make up 26.22 per cent of individuals in our data, but only 16.55 per cent of those who have spent time at Level 5. This suggests that our observed times at Level 5 are lower than the actual times people will spend at that level, that is, our data are right-censored, but this only affects observed values of time spent in levels 4 and above, and promotions to level 5 and above.

It is striking, however, that while the path of career progression is almost completely predictable, the time that people spend at different levels of the hierarchy varies considerably even within this rigid bureaucratic setup, as can be seen from Column VII of Table 3.2: for example, while the average IAS officer spent 4.68 years in Level 3, the maximum time spent by anyone at that level was nearly thrice that, at 12.92 years. There is thus considerable variation within the largely predictable pattern of promotions seen in the dataset, so that while everyone in the dataset eventually gets promoted, how long it takes them to move between levels is somewhat variable. This is exploited in the empirical strategy, discussed in what follows.

3.6 Empirical Strategy

The empirical strategy adopted to identify differences in promotion patterns for women and men in our data follows directly from the preceding discussion of the structure of careers within the IAS. We use the rank at entry (see Section 3.4.1.2 for a discussion of how this is determined), which measures how incoming recruits ranked in the recruitment process, to

sort individuals into 4 rank quartiles, and compare the career outcomes of men and women in the same quartile of the distribution.

As discussed above, promotion is more or less a given, but the time taken to be promoted varies, so I restrict myself to examining differences, if any, in the time spent at a particular level of the hierarchy (which is equivalent to the time between adjacent promotions). In particular, because of the fact that the data are right-censored, we will analyze how long it takes people to move up from Level 3, conditional on having done so (all but 12 people in the data had moved beyond Level 3 by the time the data was collected), as well as how long it took them to reach Level 3. In each case, I run regressions using a measure of career performance (time between promotions, or time taken to reach a certain level) on a constant and a dummy for female officers interacted with the rank quartile (1,2, 3 or 4), with cohort fixed effects. A typical estimating equation is then

$$y_{it} = \sum \alpha_t + \sum_{(j=1,\dots,4)} \beta_j \cdot Female_{it} \cdot Quartile_{jit} + \gamma \cdot Rank_{it} + \delta \cdot OtherControls_{it} + \varepsilon_{it}$$

where y is the outcome measure for individual i in cohort t that we are interested in (such as time in or to a particular level of the hierarchy), and the β_j s, the coefficient on the interaction between the female dummy and the dummy for being in quartile j ($j=1,\dots,4$) of the rank distribution, are the coefficients of interest which measure whether the time to(in) a level is significantly different for a female than for a male officer in the same quartile of the rank distribution, with cohort-level fixed effects and the actual rank of the individual included as an additional control.

Ideally, in looking at promotions to higher levels, we would like to be able to control not only for heterogeneity in measured ability at entry, but also for prior performance on the job, which in a setting like this is likely to be a significant contributor to future promotions. While promotion decisions are made in part based on confidential assessments, we do not have any information on the contents of these reports. However, following the literature on internal labor markets (see for example Baker, Gibbs and Holmstrom 1994), I use features of

individuals' past experiences on the job as measures of how they were perceived relative to others in their cohort when prior promotion decisions were made as an admittedly imperfect substitute for actual information on internal assessments.

In the present context, the frequency of transfers (horizontal moves within the same level of the hierarchy) is a possible measure of how the performance of individuals was viewed by their superiors. While such horizontal moves are a standard part of the job assignment process within the bureaucracy, very frequent transfers are generally thought to be punitive steps. Thus, we would expect that those who held a larger number of jobs per year spent at a hierarchical level might be the individuals seen within the system as under-performing. If so, a variable measuring the frequency of lateral moves should negatively predict future promotion times: here, we would expect that those who held more jobs per year in Levels 1 and 2 would spend longer at Level 3. If this is the case, we can use the frequency of transfer at the lower levels as a measure of how well people performed at those levels, a measure that updates what was measured by the rank at entry.

3.7 Results

Table 3.4 compares the mean time taken by individuals in the data to reach Level 3 (Panel A) or Level 4 (Panel B), broken down by gender and by the quartile of the distribution of ranks in the entrance process in which the individual was located. Both panels show the same broad pattern: while the overall differences between the time taken by men and women to reach these levels in the hierarchy are close to identical, women in the bottom quartile of the rank distribution take longer both than women in the top quartile of the rank distribution, as well as than men in the bottom quartile, who take about as long to reach these levels as men at the top of the distribution. Also, women in the second quartile of the distribution reach Level 4 faster than men in the same quartile of the rank distribution.

Tables 3.5 presents regression versions of the same results. Column I of Table 3.5 shows the coefficients from regressions of the years taken to reach Level 4 for all those who did not

skip Level 4 (which is the sum of the time spent in Levels 1, 2, and 3, or whichever subset of these levels the person has spent time at for those who skipped a level) on a constant and interactions between a female dummy and quartile dummies, the rank at entry, and the time to the previous promotion, with cohort fixed effects. The coefficient of interest is negative for women in the second quartile, and positive for women in the bottom quartile, and both are significant at the 10 per cent level. Women in the bottom quartile take nearly 4 months longer to be promoted to Level 4 than men who were placed in the same quartile as them in the entrance examination, while women in the second rank quartile take nearly 4 months less than men in that quartile to reach level 4. Column II of Table 3.5 repeats these regressions for the time (in years) the individual spent in a Level 3 job alone, excluding the people who were still at Level 3 at the time the data were collected. The results are similar to those in Column I, with women in the bottom quartile spending 0.41 of a year, or approximately 5 months, longer than correspondingly-ranked men, which is 10 per cent of the mean time spent at this level; while the coefficient on the interaction between the female dummy and the dummy for quartile 2 continues to be negative as in Table 3.5, it is now only marginally significant at the 10 per cent level.

Table 3.6 confirms that being moved around more at Levels 1 and 2 is correlated with taking longer to move up from Level 3. We therefore use this as an additional control in the regressions in Table 3.7, which can now be thought of as comparing the time taken to be promoted upwards from Level 3 for men and women within the same rank quartile who had similar transfer frequencies in Levels 1 and 2, and therefore should have looked similar to those making the promotion decision. The results indicate that the advantage for women in the second rank quartile persists even when we control for our (admittedly imperfect) measure of 'performance' at the lower levels, as does the disadvantage for women in the lowest quartile of the rank distribution, though it is not significant in the regression for years spent at Level 3.

As was discussed in Section 3.4.1.2 above, we would expect people who were recruited

through positive discrimination policies, i.e. those who belonged to the Scheduled Castes/Tribes, to be clustered in the lowest quartile of the distribution, but we do not know who they are. This makes it difficult for us to interpret the results we find here, that is, that women *in the lowest quartile of the rank distribution* take longer to get promoted than men in that quartile of the rank distribution. If it is indeed the case that SC/ST candidates performed discretely worse than non-reserved category entrants with similar ranks, then comparing the performance of men and women with similar ranks would not be equivalent to comparing men and women who performed similarly in the entrance tests, particularly as anecdotal evidence suggests that very few women from the SC/ST categories enter the IAS at all, so that the bulk of the people who are SC/ST are likely to be men. Thus, it could be that what the estimated coefficient on the female dummy is picking up is not discrimination against women, but preferential treatment for members of the SC/ST category.

While there is no way to resolve this issue without access to information about the reserved/non-reserved status of individual officers, which is unavailable, the existence of a relaxation in the recruitment age for SC/STs mentioned in Section 3.4.1.1 above means that age at entry may be an imperfect but reasonable proxy for reservation status. Candidate from the non-reserved categories had to be within 26 years of age at the time of taking the Preliminary examination. Given the time that elapses between the Preliminary examination and the candidate's first official posting, which is approximately 3.5 years (one year till the final results are declared, another 2.5 till the candidate is assigned a formal position in the service, put through training and finally assigned to his or her first job in the Civil Service) means that candidates who did not qualify through positive discrimination must be below the age of 29.5 at the time of their first posting. While some SC/ST candidates are likely to have qualified without benefit of the age relaxation, most people who are aged above 29.5 at the time of their first job's start are likely to be SC/ST.

In fact, there are 180 people in our sample who are aged above this age cutoff, and only five of them are female. Also, 69.44 per cent of these people are in the bottom quartile

of the distribution of ranks, which accords with the idea that people entering through the reserved quota are likely to be in the bottom quartile. Re-estimating our regressions with an additional dummy that controls for being above the cutoff age of 29.5 years, however, does not alter the results: even controlling for our proxy for reservation status, women in Quartile 4 do worse than men in Quartile 4. Also, the people we argue above are those most likely to be affirmative-action hires take exactly as long as everyone else in the bottom quartile to be promoted beyond Level 3. Table 3.8 reports the results of these regressions.

3.8 Possible Interpretations

The time it takes both men and women in the IAS to get promoted from one level of the Civil Service hierarchy to the next is fairly predictable and seemingly unaffected by where individuals placed in the entrance rank distribution of their entering cohort., particularly for men, whose time to promotion is unaffected in any systematic way by their rank at entry. This uniformity, however, hides disparities between women and men in the bottom quartile of the rank distribution, as well as between women who did relatively well in the entrance process and those who were among the last few to make it into the IAS. The latter category of women spend about 0.3 of a year (or 7 per cent of the mean time in that level) longer in Level 3 before being promoted than do similarly-ranked men and top-ranked women, while women in quartile 2 are actually promoted somewhat faster than equivalently-ranked men. I argue below that these results conform to the predictions of theories of statistical discrimination.

Theories of statistical discrimination have as their basic premise that employers have limited information about the skills (and possibly other attributes, such a turnover propensity) of workers, and thus have an incentive to use observable characteristics of applicants such as gender, race or ethnicity to discriminate between workers, if these characteristics are correlated with worker performance, controlling for all information that firms have about workers (Altonji and Blank 1999: 3180). In the present context, what this would imply is that to the extent that rank at entry is used by the employer to proxy for unobserved quality, women

with a low entry rank may be at a disadvantage. One way to think about the results above is to think of a high rank at entry as being the counterpart of being 'better qualified'. Having a higher rank makes employers, who would otherwise have low priors about women's abilities, to update their beliefs about women who have high ranks, but no such updating takes place in the case of low-ranked women. In such a setting, we would expect low-ranked women to be discriminated against, but for such discrimination to be less marked or absent for women higher up in the rank distribution, who might even perform better than observationally identical men (as women in the second quartile do in this data), because of greater updating of beliefs by the employer.

Other interpretations of these findings are, of course, also possible. No information is available in the data about pregnancies, maternity leave, and the time devoted to child-rearing, the burden of which which may be expected to fall exclusively or disproportionately on women. The timing of the disadvantages that seem to affect lower-quartile women IAS officers is not, however, consistent with what would be likely if the burden of raising a small child were primarily responsible: assuming entry into the IAS in their mid-twenties, the average woman would be in her late thirties by the time she is up for promotion to Level 4, given a mean time to promotion of 11.98 years (see Table 3.4), by which time any children are likely to be well past their early childhood. Secondly, upper-middle-class Indian professional women usually have access to a large amount of very cheap or free childcare provided by maids, nannies and in-laws, so that childcare time is usually not thought of as being a major drain on the time of professional women in the way it may be in richer countries where labor, and consequently childcare, is relatively more expensive.

Finally, it is of course possible that women, especially those who performed relatively poorly at the entrance stage, may simply be less motivated and/or may become progressively less motivated and interested in their careers over time. This possibility cannot be discounted given the nature of the data to which I have access here: I have no information about whether individuals were interested in being promoted and about their levels of motivation.

I would argue, however, that seen in combination with the fact that higher-ranked women, i.e. those in the second quartile, are actually promoted faster than the corresponding men, the relative under-performance of low-ranked women suggests that the statistical discrimination interpretation posited above may be the most viable explanation of the promotion patterns seen in the data, since it is able to explain both why relatively poorly-ranked women would do worse, and why high-ranked women might do as well or better than their male counterparts.

3.9 Conclusion

Women in the public sector in India are relatively better protected against the most blatant forms of gender discrimination, such as denial of promotions, or unequal pay for the same job, that may afflict the private sector (see Kumar et al. 1996, Esteve-Volart 2004). However, even within the most elite segment of the national bureaucracy, the Indian Administrative Service, it appears that women in the lowest quartile of the entering cohort ranked by entrance-examination performance, do take longer to be promoted from one level to another than comparable men, while women in the second-to-highest rank quartile were promoted faster than their male counterparts, a pattern that I have argued above is consistent with theories of statistical discrimination based on gender. Given the crudeness of my outcome measure - the time it takes to get promoted from one broad level in the hierarchy within the Civil Service to the next - this finding suggests that the overall pattern of uniform, predictable careers within the Indian bureaucracy may mask significant differences in the experiences of men and women when it comes to job assignments, the prestige of the positions held, policy influence, etc, issues which could be fruitfully explored in further work on this issue.

3.10 References

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Table 3.1: Cohort Size and Gender Composition

Cohort	Total	Male	Female	% Female
1971	67	55	12	17.9
1972	101	81	20	19.8
1973	89	76	13	14.6
1974	119	93	26	21.8
1975	113	94	19	16.8
1976	118	105	13	11.0
1977	132	119	13	9.8
1978	118	108	10	8.5
1979	108	88	20	18.5
1980	110	99	11	10.0
1981	111	101	10	9.0
1983	143	128	15	10.5
1984	128	113	15	11.7

Table 3.2: Gender Distribution by Rank Quartile

	% of Quartile	% of Women In Quartile	% of Men In Quartile
Quartile 1	14.41	25.89	24.07
Quartile 2	14.59	27.41	25.1
Quartile 3	15.03	27.92	24.7
Quartile 4	10.11	18.78	26.13

Table 3.3: Career Progression in the Indian Administrative Service

Level	Name(s) of Scale	% Beginning at Level	No. Who Not Reach Level	Minimum Years in Level	Average Years in Level	Max Years in Level	Years in Level, Normative
1	Junior Time Scale	99.6	6	0	2.03 [.702]	7.34	4**
2	Senior Time Scale Under Secretary	0.4	1	0	5.31 [1.134]	14.61	5
3	Junior Administrative Grade/ Deputy Secretary	0	7	0	4.68 [1.496]	12.92	3
4	Director Selection Grade	0	54	0	4.08 [2.366]	14.26	8
5	Joint Secretary Supertime Scale	0	224	0	6.82 [4.438]	17.61	10
6	Additional Secretary	0	1145	0	0.57 [1.84]	10.63	4

** the first job assignment listed for all IAS officers begins approximately 2 years after their recruitment

Table 3.4: Time to Promotion by Rank Quartile and Gender

Panel A: Time Taken To Reach Level 3 (Years)

	Men	Women
All Quartiles	7.33 (1.05)	7.38 (1.01)
Quartile 1	7.33 (0.89)	7.30 (0.88)
Quartile 2	7.25 (0.92)	7.41 (0.89)
Quartile 3	7.39 (1.02)	7.23 (0.99)
Quartile 4	7.31 (1.06)	7.41 (0.88)

Panel B: Time Taken to Reach Level 4 (Years)

	Men	Women
All Quartiles	11.91 (1.13)	11.98 (1.15)
Quartile 1	11.92 (1.22)	11.98 (0.93)
Quartile 2	11.92 (1.16)	11.61 (1.17)
Quartile 3	11.87 (1.10)	12.09 (1.09)
Quartile 4	11.91 (1.06)	12.34 (1.38)

Table 3.5: Time to Level 4 or Time in Level 3 by Gender and Rank Quartile

Note: Female*QJ is a dummy which is 1 for females in Quartile J(1,...,4) of the Rank Distribution

Dep Var, Column I: Time in Yrs to Level 4

Dep Var, Column II: Time in Yrs in Level 3

	I	II
Female*Q1	0.0870	0.0520
[SE]	(0.163)	(0.173)
t-ratio	0.53	0.30
Female*Q2	-0.308*	-0.266*
[SE]	0.1615	-0.165
t-ratio	-1.91	-1.6
Female*Q3	0.172	0.152
[SE]	0.153	(0.163)
t-ratio	1.12	0.94
Female*Q4	0.342*	0.409**
[SE]	(0.1937)	-0.202
t-ratio	1.77	2.02
Rank	-0.0002	-0.0006
[SE]	(0.0008)	(0.0009)
t-ratio	-0.32	-0.61
Cohort Fixed Effects	Yes	Yes
N	1403	1443

**Table 3.6: Effects of Frequent Transfers:
Relationship Between Jobs Per Year at Lower
Levels and Subsequent Promotions**

Panel A: Jobs Per Year in Level 1 and Years in Level 2

Dependent Variable: Years Spent in Level 2

Jobs/Yr at Level 1	0.2521***
[SE]	(0.0860)
t-ratio	2.93
Cohort Fixed Effects	Yes
N	1452

Panel B: Jobs Per Year in Level 1, 2 and Years in Level 3

Dependent Variable: Years Spent in Level 3

	I	II
Jobs/Yr at Level 1 and 2	0.7689***	---
[SE]	(0.1655)	---
t-ratio	4.65	---
Jobs/Yr at Level 2	---	0.5850***
[SE]	---	(0.1317)
t-ratio	---	4.44
Cohort Fixed Effects	Yes	Yes
N	1452	1452

Table 3.7: Time Spent In Level 3 or Till Level 4, Controlling for Frequency of Lower-level Transfers: Female vs Male Officers by Rank Quartile

Note: Female*QJ is a dummy which is 1 for females in Quartile J(1,...,4) of the Rank Distribution

	I	II
Dep Var, Column I: Time in Yrs to Level 4		
Dep Var, Column II: Time in Yrs in Level 3		
	I	II
Female*Q1	0.0780	0.0865
[SE]	-0.166	(0.204)
t-ratio	0.47	0.42
Female*Q2	-0.286*	-0.366*
[SE]	(-0.164)	(0.195)
t-ratio	-1.74	-1.88
Female*Q3	0.166	0.18
[SE]	(0.156)	(0.192)
t-ratio	1.06	0.94
Female*Q4	0.374*	0.289
[SE]	-0.197	(0.239)
t-ratio	1.9	1.22
Rank	-0.0003	-0.0006
[SE]	(0.0009)	(-0.001)
t-ratio	-0.31	-0.54
Jobs/Yr in Levels 1,2	0.256**	0.808***
[SE]	0.129	(0.159)
t-ratio	1.97	5.08
Cohort Fixed Effects	Yes	Yes
N	1403	1443

Table 3.8: Time Spent In Level 3 for Officers in Fourth Quartile, Controlling for SC/ST Entrants

Dependent Variable: Years Spent at Level 3		
	I	II
Female	0.571***	—
[SE]	(0.224)	—
t-ratio	2.55	—
Reserved Quota Proxy	0.111	0.064
[SE]	(0.149)	(0.149)
t-ratio	0.74	0.43
Quartile	4	4
Cohort Fixed Effects	Yes	Yes
N	364	364

Column I: Women vs Men, Controlling for those who are SC/ST proxied by age
 Column II: SC/ST Versus Non SC/ST