Gender and Social Norms in Economic Development

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Abstract

'Gender and social norms in economic development' analyses gender related issues throughout the development process from an economics point of view. Different issues are examined for countries at different stages of the development process. The issues examined here have a gender component and have to do with participation and social norms. In some cases, the motivation for this differential participation or inequality is the focus of the study; in others, we focus on the economic consequences of this differential participation. In the first chapter, we investigate participation in dowry in a very poor area, namely rural Bangladesh. In that chapter we explore the different possible economic motivations for dowries using household survey information from the Matlab area in rural Bangladesh spanning 1930-1996. We find that dowry participation in the area has increased in recent decades. We also find that religion, coupled with social norms, seems to be an important component in explaining the evolution of dowry. In the second chapter we examine the economic consequences of different participation by gender in the labour market in a poor country – India. We develop a model that suggests distortions in the allocation of talent which we then test with aggregate information by sector using panel data from India's states over 1961-1991. Results suggest that even though implications are different by sector, gender inequality

in labour participation in several categories hinders development. In the third chapter, we indirectly study participation of women in top level positions, by analising the different hiring by gender in Spanish public exams. The analysis constitutes a relevant randomised experiment with implications for gender parity rules, or gender quotas. We use information about 75,000 candidates to the judiciary over 1995-2004 who were randomly allocated to evaluating committees. Contrary to expectations behind gender parity rules, we find that recruitment committees with a higher share of women hire fewer women than committees with a higher share of men, suggesting that taste discrimination is not behind the low numbers of women in top level positions.

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Introduction

'Gender and social norms in economic development' attempts to provide some insights into the role of gender along the development process by using economics tools. By focusing on three different spheres and three diverse development stages, this thesis tries to analyse levels at which some sort of participation in the economy might be different by gender.

In the first chapter, 'Dowry in rural Bangladesh: participation as insurance against divorce', we examine a topic that has been subject to controversy in the economics literature: the role of dowry in current South Asia. Here, we particularly focus on Bangladesh. This chapter allows us to examine a potentially discriminatory custom within the household/marriage market sphere in a very poor country.

In the second chapter, 'Gender discrimination and growth: theory and evidence from India', we focus on the different participation in the labour market by men and women in a poor country, namely India. In this case, our goal is to investigate into the aggregate efficiency costs of women's limited access to the formal labour market.

In the third chapter, 'Will gender parity break the glass ceiling? Evidence from a randomised experiment', the issue at stake is participation in the top level positions in a richer country, Spain. For this we use evidence from public exams, and try to see if there is any difference in recruitment by gender according to the gender of candidates. In sum, we ask the question, does a female candidate have more chances to pass the exam if she is evaluated by a committee with a relatively high female share?

Bangladesh is a very poor country. According to the World Bank, Bangladesh's per capita gross national income in 2004 was of $1,980.[1] The corresponding income figure for India is $3,100, compared with $25,070 for Spain. There is a striking difference between both South Asian countries and Spain, but the difference between Bangladesh and India, neighbouring countries, is also substantial which, we think, makes the analysis in this thesis more interesting.

The topics examined in the chapters can be analysed from the point of view of social norms. A social scientist with a large body of work on the topic, Jon Elster defines social norms as injunctions to behaviour that (1) are non-outcome oriented, (2) apply to others as well as oneself, (3) are sustained by the sanctions of others, and (4) are sustained by internalised emotions (Elster 1989a,b). Social norms constitute guides to behaviour in everyday life, outside the formal legal system; as opposed to legal norms, they are enforced by members of the general community, and not always out of self-interest. Social norms are in contrast with economic incentives: when economic incentives exist, individuals do not need guides to behave in a particular way. However, as argued by Lindbeck (1997), both social norms and economic incentives can lead to rational behaviour, in the sense that individuals act in accordance with expected reward or punishment, even though the form these take differs substantially in the two cases.

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[1] Current international dollars, PPP adjusted (World Development Indicators 2005).

Indeed, that author addresses the interaction of both in the form of work social norms. This, as we shall see below, is relevant for all the chapters in this thesis, in chapter 1 in an indirect way, while in chapter 3—and especially chapter 2—in a more direct way.

In the first chapter, we investigate into the motives for dowry payments in the Matlab area in rural Bangladesh. We find that over the last decades participation in the dowry custom has dramatically increased within the Muslim community,[2] while participation was already high for the Hindu community. In investigating the motive for dowry payments, we are also in fact implicitly questioning whether the custom of dowry is a social norm, or it responds to economic incentives. In some literature, dowry has been described as a social norm. While two sets of economic incentives have been previously identified in the dowry economics literature, such as dowry as the price for a husband (Rao 1993, Anderson 2004) and dowry as pre-mortem inheritance to daughters (Edlund 2000, 2001, Botticini and Siow 2003), we identify a third economic incentive—dowry as device for reducing the daughter's probability of being divorced. This again has a social norm component, in that it is social norms impeding many sorts of female work (particularly those which involve contact with men) that generate the need for parental protection from divorce—as the woman's outside option in marriage is very low, parents want to ensure their daughters are not abandoned by providing large dowries that must be refunded by the divorcing husband. Thus, social norms

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[2] Muslims constitute 90% of the total population in Bangladesh.

are key to understanding a motive for dowry in rural Bangladesh. Even though social norms do not appear to cause dowry in a direct way,[3] our findings suggest that social norms that create highly unequal gender relations in both the social and legal spheres increase the need for dowry payments as insurance device. In that sense, it can be predicted that dowry in rural Bangladesh would naturally disappear with more equality in gender relations in the social and legal arenas—for, in that case, a woman's divorce will not have to be so closely associated with stigma and economic disgrace.[4]

Whereas some other studies in the literature, such as Anderson (2004), have emphasised the historical, long-term approach to dowry, chapter 1 provides an explanation that suggests the importance of local social norms, interacted with religion, in shaping gender relations—and in turn, welfare. It is worth mentioning that we do not find that religion plays a direct effect on dowry participation, in the sense that families of all creeds participate in dowry, but rather we find that religion plays an indirect effect on dowry participation: it is the possibility of men divorcing unilaterally under Islamic law that generates economic unsecurity and other unwanted consequences for wives.[5] An interesting question is why would this social norm find its operation enhanced in recent decades within Muslims in rural Bangladesh—since dowry disap-

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[3] The fact that dowry giving has been prohibited in various countries does not mean that dowry is not a social norm since, as Coleman (1990) argues, social norms not only can be outside the legal system but can also be in conflict with a law.

[4] This is the case in rural Bangladesh where it is unilateral divorce by husbands, *talaq*, is the most common type of divorce (Kamal). See more on this in the background appendix to chapter 1.

[5] For more on Islamic family law, see the background appendix to chapter 1.

peared in Europe a long time ago.[6] Indeed, if dowry plays a role as insurance device, its increasing importance would be linked to an increase in the risk associated with marriage—that is, the risk of the husband divorcing the wife. We hypothesise that this is related to two phenomena: (1) the decreasing importance of dower, a marital transfer which used to be provided in the past by the husband to provide for the wife in case of divorce or death of the husband (Hossain 2003, Amin and Cain 1995), and (2) the interaction between increasing marriage registration and informal enforcement of dowry refund. Since we do not have data on dower nor marriage registration, we cannot test these hypotheses. They are however discussed in section 5 in chapter 1. We believe it suggestive that some legislation for compulsory marriage registration affecting the Muslim community, the Muslim Marriage Act of 1974, was passed at the time that the practice of dowry became more widespread within that community.[7]

Is dowry good or bad in rural Bangladesh according to our findings? Dowry seems to be instrumental in bringing some protection for daughters in the context of unequal gender relations. However, there could be other instruments for this purpose. The payment of dower (which, according to research in rural Bangladesh) is less common in modern times, or alimony (seemingly also not usually complied with in many

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[6] For information on dowry disappearance in Europe, see Botticini and Siow (2002) and Anderson (2003). The former suggests disappearance would be related with the development of labour markets, while the latter suggests it would be related to the wealth-based nature of status in Europe (vs. caste-based in India).

[7] See the end of chapter 1 for a background appendix on Islamic family law detailing transfers and sacraments.

cases) can provide the divorced women with funds—and hence the insurance component of dowry would not be needed.

What are the links between development and dowry in rural Bangladesh?

On the one hand, there is the link from development to dowry. The evidence is that dowry has disappeared in rich countries, and still persists nowadays mostly in Asian and African societies. For our area of study, and based on the findings in chapter 1, we would expect that dowry becomes less important as gender relations become more equal. While this is usually associated with higher income, it is not always the case, as we shall see in chapter 2, that economic growth improves gender equality: in India it seems to be the case that as households get out of poverty, they are more able to afford following the social norm concerning women's limited access to work, which keeps gender relations unequal. Therefore, economic growth in itself might not be enough to equalise gender relations, and thus in turn, economic growth might not be enough for dowry to disappear. Indeed, this is also consistent with empirical evidence, as participation in dowry has increased over time in our data set just as the economy has been growing. Hence there seems to be a non-linear relationship on this side of the equation, being affected by diverse factors.

On the other hand, the effect of dowry on economic development is less clear. It has been argued that dowry, combined with the ideology of hypergamous marriage (where a woman marries "up" in the social scale) can turn female education into a lia-

bility. If an educated girl can only marry a more educated boy, and if dowry payments increase with the education of the groom—as it is found in chapter 1, as well as in other literature, such as Edlund (2001) and Anderson (2000, 2004)— then, anything else held constant, an educated girl is likely to be more expensive to marry off (Dreze and Sen 1995). Thus, one way in which dowry could affect growth is through lower female education. However, the bridegroom's possibility to fetch a higher dowry would analogously increase with education, and then dowry could analogously affect growth through male education.

A paper by Lindbeck *et al* (1999) has modeled the case of a social norm that is enforced by social stigma and the individual's preference for avoiding stigma or embarrassment. In particular, they assume that individuals who live off transfers, as opposed to live off one's own work, suffer from stigma. Although the type of stigma here is different, this feature is implicit in the model for gender discrimination in chapter 2. There is ample literature in various fields that suggests that working women in certain less developed areas, such as South Asia, are stigmatised. Hence, there seems to exist a social norm regulating women's access to the labour market. In chapter 2, we call the result of this social norm 'discrimination'. In fact, although we see the result of such social norm as discrimination, this concept does not conform with the term of discrimination that economists (in particular labour economists) commonly use: that of differential outcome (be it wages, health-related outcomes, or educational outcomes)

that cannot be explained after controlling for all potential important variables. However, to the extent that stigma is directed to women only, that can also be considered a discriminatory *practice*—one that has no visible actors, but which is nonetheless enforced at the social sphere. That is: we are viewing this social norm as discriminatory against women, in a broad sense of the term. Thus, we believe that calling this *inequality* would not be as appropriate, as inequality could be the result of women's own purposeful choices. This is an interesting feature, as indeed women might contribute to the differential labour force participation considered here, but the stigma, or cause of the differential outcome, would not originate within women's will. On a related note, it is interesting how the social norm could in this case be linked with emotions— for, the couple where the wife works would be ashamed: here, the emotion of shame sustains the social norm, even if the outcome of that particular behaviour—in this case, staying at home and hence only working from home—might conflict with economic incentives (Elster 1996). That is the case we pose in the model in chapter 2: a woman might earn some wage from working from home, but this is lower than what she could earn by working outside the house.[8]

Elster (1989a) argues that many social norms do not benefit anyone—this is not exactly the case in chapter 2, where we look at the relationship between women to men's participation in the labour force in the formal economy and output, but we can

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[8] Notice that this could be due to several reasons, like scale economies in production.

draw some parallelism. In India, it is not richer states that display greater female labour force participation, but states where generally women have relatively more freedom and a more prominent presence in society—suggesting the presence of social norms. As we argue in the background information section in chapter 2, female labour force participation in India is most likely the result of the interaction between social norms (enforced by social stigma that obliges men to provide for their families) and economic conditions. As mentioned by Goldin (1995), there is a neat intersection between social norms and economic development that hinges on gender—as it is on fairly early stages of the modernisation process that we see working women being stigmatised, while in more advanced stages of the development process, as experienced by the European and North American economies, more women join the formal labour market. Goldin (1995) pictures the relationship between development and female labour participation as U-shaped: in early stages of development, for very poor countries an increase in income reduces labour force participation, since men moving from agricultural to blue-collar jobs that increase family income exert income effects that reduce women's participation. Furthermore, as men move out of agriculture and into blue-collar jobs, there might be fewer family enterprises and family farms in which women can work, reinforcing the lower women's participation. Now, as economic development continues, the growth of white-collar jobs presents more opportunities for women's jobs, or more acceptable jobs for women. In addition, more education also

increased labour force participation. Mammen and Paxson (2000) look at the relation-ship between development and labour force participation for a set of 90 countries and find evidence for this U-shaped relationship: they find that countries that make up the downward-sloped part of the U tend to be African, followed by South Asian, while South and Central American economies are at the bottom of the U, followed by South European, East Asian, North European and finally North American countries going up the upward-sloped part. Goldin (1995) attributes these social norms to stigmatisation: societies stigmatise the husbands of women in blue-collar jobs. Mammen and Paxson (2000) provide another potential explanation for why social norms would dictate that white-collar jobs are more acceptable for married women, while blue-collar jobs are not (which would lead to a reduction in women's participation at early stages of de-velopment): that factory work does not pay wives enough to compensate for the fixed costs of working away from home.

Mammen and Paxson (2000) also examine survey data from Thailand (for 1981-1996) and India (for 1993-1994) in order to find more about development and women's work. Using non-parametric regressions, they find that the U-shaped pattern holds for these data sets: in the poorest households (as measured by household per capita expenditure), women are most likely to participate in the labour market. While this holds for both countries, there are differences in that Thai women participate more than Indian women, and in that the U-shape is more pronounced for India. The authors

also find that being a member of a scheduled caste or tribe is associated with greater participation. That is, all these results suggest that for poor or low-caste households, increases in household expenditure lead to lower participation of women in the labour market. In fact, in India, higher spousal education is negatively associated with work as an employee (as opposed to Thailand, where the relationship is positive), which the authors identify with greater social stigma attached to women working outside the home in India.

It is not only in work participation that we see the operation of social norms that determine standards in working patterns that sustain differences by gender. Indeed, there has long been a notion of what 'women's jobs' and 'men's jobs' are—sustaining stereotypes and in turn occupation segregation by gender. This is related to the model in chapter 2, as one type of discrimination we explore there is in fact occupational, where women only have access to unskilled positions, while they do not have access to managerial positions. Thus, managerial positions there are taken as 'men's jobs'.

In a seminal paper, Edward Gross (1968) introduced the concept of occupational gender segregation to social scientists. He showed how the degree of occupational segregation by gender could be quantified and how it could be traced over time by using an index of dissimilarity (the well-known Duncan and Duncan (1955) index, extensively used in the sociological literature since then) which can determine the percentage of women (or men) that would have to switch jobs for the distribution of women and men

to be the same. Using this method, Gross found that the index remained virtually the same for the United States from 1900 to 1960 at about 67 percent—remarkably, this was true despite continuous increases in women's labour force participation and the social and economic upheavals brought about by two world wars and the Great Depression. However, this figure declined to 53 percent from 1970 to 1990, although it is lower when considering less aggregate sectors.[9] The persistence of occupational segregation shows the persistence of social norms even in the presence of changing social conditions. As mentioned elsewhere, the patterns in employment by gender go beyond what can be explained by women's assumed lower labour force attachment (Mincer and Polachek 1974) where women work in occupations requiring lower firm-specific human capital investment. Therefore other explanations have been used in order to explain this differential labour market patterns: models of statistical discrimination, like Lazear and Rosen (1990) and Bulow and Summers (1986), or the identity model developed in Akerlof and Kranton (2000). Lazear and Rosen (1990) describe how statistical discrimination in the promotion process makes it difficult for women to progress up the job ladders—such discrimination would be rational and operates on the belief that women are more likely to withdraw from labour market activities than men. Hence, even women who e.g. do not have children and do not want to withdraw from the labour market might get lower wages than men.

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[9] See Goldin (1990) for more US historical measures.

In Akerlof and Kranton (2000) social norms play a big role by changing what would be consistent with standard utility maximisation. Identity, which includes for instance notions of what people are supposed to be and do, introduces an element that changes the individual's utility in such a way that utility maximisation becomes consistent with individuals' actions. In Akerlof's and Kranton's model, women would suffer a utility loss from performing what is considered to be a 'man's job'. Similary, we could instead define any job, or any formal market job, as a 'man's job', and thus get an identity foundation of the discrimination studied in chapter 2. In that paper, a model is developed displaying equilibrium outcomes according to several identity-related parameters that are linked with utility. The model assumes the existence of identitity-related utility externalities: the main idea in their basic model is that Person One could suffer an (identity-related) utility loss if Person Two does something that does not match Person One's taste, which provides Person One with an economic incentive to try and deter Person Two from doing the thing that does match Person Two's taste. Given these assumptions, the authors describe four possible equilibrium possibilities. In one of them, the outcome is consistent with the outcome situation considered in chapter 2. There, Person One (here, the man) deters Person Two (here, the woman) from engaging in labour force participation. This happens whenever two conditions are met: first, that the man's cost of deterrence is lower than the utility loss that

the man would experience from the woman's labour force participation.[10] Second, that

the utility the woman derives from working is on the one hand larger than her utility

loss from not working, while on the other hand it is smaller than the sum of her util-

ity loss from working[11] plus her utility loss from the man's action. In this situation,

men can take action against women coworkers, or women engaging in the labour force,

reducing everyone's productivity. In the former case, the firm might want to change

gender-job associations (at a cost): for instance, by describing, and hence turning, a

previously 'woman's job' into a 'man's job'. However, sometimes these gender-job as-

sociations do not have an origin in one firm, and hence cannot be changed by a firm's

policy. If these associations are sectorwide or economywide, as Akerlof and Kranton

(2000) explain, these gender-job associations might persist—which is consistent with

the empirical evidence of persistent occupational segregation—, as perfectly compet-

itive firms will underinvest in new job categories, so in the absence of market power

or technological change, a shift in social attitudes and legal intervention might be nec-

essary for changes in employment patterns (a major change of this sort happened for

instance in the United States during World War II, when the recruitment of women

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[10]   Akerlof and Kranton (2000) describe this utility loss as derived from anxiety.

[11]   This is again described as anxiety: the intuition is that the person would experience anxiety when not complying with the social norm; this would be due to her internalisation of prescriptions. Hence the person (in our case, the woman) might want to refrain from engaging in labour market activity to avoid this anxiety.

into 'men's jobs' was accompanied by official propaganda and popular literature that depicted women taking on factory work without loss of femininity (Milkman 1987)).

However, an identity foundation is not the only one consistent with the model in chapter 2. First, it could be women's lower confidence about their professional capabilites that accounts for a lower supply of formal labour market workers. This is consistent with the empirical evidence in Bengtsson *et al* (2004), where in an experiment female students decide to answer fewer questions in an exam than male students, even though there is no mark loss from getting those questions wrong. In the same way, one could think the lower supply of women for managerial jobs (in the model, none) could arise from women's underconfidence issues.

A second explanation could be found in women's lower ability in competitive environments, as found in a controlled experiment by Gneezy *et al* (2003), as well as in children's racing in Gneezy and Rustichini (2002). In the former, the authors run an experiment in which university students had to solve mazes. Students were both mixed by gender and separated by their gender. In the latter, the authors observed races of nine-year old children of both genders. This age was chosen so as to try and abstract from gender roles that can arise later in life. The results of both papers are somewhat different though, as women contesting against only other women in the former do better than when mixed with males, while in the latter girls running alongside with boys seem to perform better than when running only alongside other girls. From this com-

parison one could say that women's lower competitiveness when working with men is not a biological feature. Which would link this set of evidence with the confidence issues found in Bengtsson *et al* (2004), and possibly with the motives behind the low numbers of women in top level positions as discussed in chapter 3.

Indeed, the low numbers of women in science might have at least something to do with underconfidence. Goodman *et al* (2002) report that women are not dropping out of engineering programs because of poor performance—rather, many women who left mentioned negative aspects of the school's climate such as competition, lack of support, and discouraging faculty and peers. Similarly, positive perceptions of self-confidence seem to have been highly associated with staying in the program. Moreover, studies show that in male-dominated graduate programs, female students show lower feelings of competence than male students show (Ulku-Steiner *et al* 2000).

As mentioned in Akerlof and Kranton (2000), the identity model, and in turn the type of discrimination in chapter 2, can be related to the early theories of discrimination. Indeed, the 'distaste' of men for working with women, as in the crudest adaptations of racial discrimination models (the taste-based discrimination model, Becker 1971) could be understood as due to loss in male identity when women work in a man's job. In the same way women's assumed lower desire for labour force participation (Mincer and Polachek 1974, Bulow and Summers 1986, Lazear and Rosen 1990) could be understood as the result of their identity as homemakers. This, again, fits

nicely with the notion of discrimination in chapter 2. In this context then, and if the case of India is to follow the pattern of the United States in the future, we might expect to see changes in women's engagement in labour market activities whenever a women's movement is able to reshape societal notions of femininity and masculinity, removing, or at least somewhat eroding, gender associations from tasks. We discuss this issue further in the conclusions.

Here we have another example of how social norms can collide with economic incentives in some way. Although the comparative advantage theory as applied by Gary Becker (1965) to the household provides incentives for the person who works more hours outside the home to lead homework specialisation to the other person in the household, and hence productivity would be maximised and in turn efficiency would be achieved, empirically this is only the case from one side: Hochschild (1990) and Akerlof and Kranton (2000) find that whenever the wife works more hours outside the home, she is also the household member that works more hours at home. Here, the social norm according to which homework is to be performed by the woman hampers actual comparative advantage—and hence the social norm is at odds with economic efficiency. This is not to say though, again related to Jon Elster's work, that this asymmetric situation is in opposition with economic rationality, as it might in fact be utility

maximising (again, an identity approach in the manner described above would suffice to see this).[12]

How is this related with output? In the empirical analysis in chapter 2 we find that Indian states with lower ratios of female to male managers in the formal economy have lower per capita output in the non-agricultural sector. Therefore, the social norm considered there is detrimental in aggregate terms, as it causes output to decrease. However, it is not the case that the social norm does not benefit anybody: the theoretical section shows how some not-so-talented men benefit from the social norm: while they would become workers without the operation of the social norm, in the case that women cannot get into managerial positions they find it optimal to become managers. Thus, average talent of managers decreases, which would affect growth negatively, but at the same time some men derive greater income.

On another note, one of the implications of chapter 2's results is that gender discrimination of the type analysed will not disappear with only economic growth. This is bottomline that is also common in other literature, like Murthi et al (1995), who using district-level data for India find that indicators for levels of development had insignificant or even negative effects on gender variables, whereas variables directly related to women, such as female labour force participation rates and female literacy rates, had positive effects on gender ratios. This evidence is consistent with Boserup's

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[12] See Hochschild (1990) and Akerlof and Kranton (2000) for some examples.

(1970) theme that economies might grow without making women better off, and is again consistent with the social norms story in e.g. Goldin (1995).

The model in chapter 2 can also be related to the other major strand of discrimination theories. In models of statistical discrimination (Arrow 1972, 1973, Phelps 1972), uncertaninty in the labour market, coupled with some other force, generates discrimination in the labour market. In particular, the first case of discrimination explored, in which women cannot gain access to managerial or entrepreneurial positions, could arise from discrimination in the credit market. We could assume that setting a firm requires a fixed investment, such that the entrepreneur has to borrow some amount of money. Then discrimination could arise for instance from women facing higher interest rates in the credit market, when banks believe that women's productivity is lower than men's productivity. When women face interest rates high enough, no female would decide to be an entrepreneur. That is, this type of discrimination in the labour market could be the result of uncertainty in the credit market.

Statistical discrimination against female workers has been empirically found in the developing world context: in a study of an agricultural labour market in rural Philippines, Foster and Rosenzweig (1996) find that women can be found in weeding while men can be found in harvesting activities. Their results discard taste discrimination on the part of employers, but they do find that workers who are more productive have a comparative advantage in harvesting—since women are in average less produc-

tive, and because the employers cannot discern completely differences in individual worker productivity, given a man and a woman of equal productivity, the woman is more likely to be employed in weeding. As pointed out by the authors, given that informational asymmetries play no role in the allocation of workers to tasks in the piece-rate work sector, this also explains why occupational segmentation by gender is greater in time-wage employment than for piece-rate work or on-farm employment, a salient feature of Asian agriculture.

In chapter 3, we study how the gender of recruitment committees for public exams in Spain has an effect on the success of candidates by gender. The topic is interesting because of the current relevance of gender parity rules in Spain and other countries. Gender parity rules, or gender quotas, are becoming a policy area because of the low numbers of women in in the public and the private spheres. Women are a minority in Parliamentary seats across the globe, at top political or public positions, and at company boards: in political positions, only in 12 out of 179 countries women accounted for at least 30% of parliamentary seats in 2003.[13] In the private sector, in Italy and France, only 3% and 4% respectively of the 50 largest companies' board directors are women,[14] while in the US, women constituted only 3.4% of the top level management in a sample of firms in 1997.[15]

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[13] Sweden leads the list with 45% (UN Millennium indicators).

[14] According to a report from the Aspen Institute Italia (The Economist).

[15] Bertrand and Hallock (1999).

Gender quotas are often imposed on either of the following two stages of the selection process: the stage of finding aspirants, e.g. those willingly to be considered for nomination, or the stage of nominating the actual candidates (e.g. to be placed on the ballot by the party). In some cases, gender quotas are imposed on a third stage, the already selected or elected candidates. Here we implicitly consider gender quotas at a different stage, the *candidate evaluation* stage, but our evidence could also apply to the other quotas.

In the past, policy towards gender equality in the professional and public spheres seemed to focus on the so-called *equal opportunities* approach. Underlying this approach was the pipeline theory, according to which women are moving their way through the pipeline and into top level jobs. In that context, an increased ratio of female students would lead, more or less automatically, to an increase of women further up in the system. Accordingly, policy was designed to encourage women's higher education and skills on the understanding that providing women with the same human capital as men would enable them to reach the top positions they seemed unable to attain. The evidence for the pipeline theory is disappointing, as despite significant increases in the female ratio among students in higher education, a minority of e.g. academics, for instance, are women. This low participation at all high levels is summarised in the so-called glass ceiling: there is a prevailing view that women have started to move up into management and public positions, but once they reach a cer-

tain point, the so-called 'glass celing', they do not seem to go any further. Whatever the reason behind the existence of a glass ceiling, pessimism about the pipeline theory might explain the more recent approach, that of *equal results*: the imposition of gender parity in outcomes, such as cabinet, or board membership. The shift in policy is obvious in the Spanish case. In a recent governmental document on proposals towards gender equality, equality of opportunity is mentioned only once, while gender parity appears in the document six times.[16] Underlying this shift in policy lies the recognition that the equal opportunities approach has not created the desired move towards gender equality. Thus, the motivation for imposing gender parity seems to be the rationale that once more women are in top positions in the public sphere, it should be easier for other women to get to that level—in other words, gender parity in decision-making could break the glass ceiling.

Nevertheless, it is not clear that imposing gender parity in top positions is going to increase the numbers of women in other high positions. Although implicit in many discussions of gender parity policy, there is no clear evidence for the hypothesis that the lack of women in top positions is due to men discriminating against women. Indeed, the rationale seems to be that women do not get to top level positions because they are being discriminated against, in the sense of taste discrimination—if (male)

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[16]   ORDEN PRE/525/2005, March 7 (*BOE, March 8, 2005*).

employers have a taste for male employees, then more male employees are hired and later promoted.

However, there are several other potential reasons behind the low numbers of women in top positions: as mentioned before, it could be due to two sets of issues; first, identity issues, women's lower ability to compete in competitive environments, or lower confidence issues. All these explanations, consistent with social norms, and do not constitute discrimination in an economics sense. Second, it could be due to statistical discrimination originating for instance in women's higher likelihood to withdraw from the labour market than men's.

In chapter 3, we use data of about 75,000 candidates to public exams for accessing the judiciary in Spain over 1995-2004. This case is econometrically of interest because the process whereby candidates and recruitment committees are matched is random. Hence, we have access to a randomised experiment. We have information on evaluating committee characteristics, including the gender, age, experience, and rank of committee members. In chapter 3, we find that female candidates are more likely to succeed if evaluated by recruitment committees with fewer women. This is a somewhat surprising result, as in the discussions of low percentage of women in decision-making, it is usually assumed that the reason is men taste-discriminating against women.

Contrary to expectations then, the evidence in chapter 3 is consistent with either social norms or statistical discrimination as reasons for the low numbers of women in

top positions. This evidence suggests that gender parity laws or quotas that impose greater female shares in recruitment committees are not going to be associated with more successful women, but rather fewer. This is essentially telling us that women are, at least in that case, not taste-discriminated against for, if they were, an increase in the female share of committees would show more successful women.

In the case that the low numbers of women are due to social norms, gender parity could work only if in connection with a major cultural change as, for example, the women's liberation movement in the late 1960s and early 1970s in the United States.

Our findings also suggest that there are two reasons behind women's poorer perfomance when evaluated by women. On the one hand, it seems that male evaluators are more generous towards female candidates. On the other hand, it seems that female evaluators are more strict with female candidates. The latter is consistent with statistical discrimination, while the former is consistent with some sort of taste discrimination in favour of females.

The finding in chapter 3 hence suggests that gender parity laws, at least in that context, are not going to increase the percentage of women in top level positions, because they are not being taste-discriminated against. Rather, strategies meant towards that goal should focus on social norms or statistical discrimination explanations. This finding is important in light of the fact that the matching of candidates to evaluating committees is random. Furthermore, the relevance of public exams is great in Spain,

as (1) each year about 175,000 university educated individuals are preparing for the exams, (2) the exams determine the judiciary as well as the professional elite, and (3) successful candidates later on go to become decision-makers in society.

Chapter 1
Dowry in Rural Bangladesh: Participation as Insurance Against Divorce

Indian Government statistics show that husbands and in-laws killed nearly 7,000 women in 2001 over inadequate dowry payments (BBC News, July 2003)

Dowry can be seen as a form of pre-mortem inheritance to the bride (Goody, 1973)

Once the dowry has been paid, a woman's position may be strenghtened because the husband cannot drive her out of the house so easily. To do that he would have to pay back that money first (Simmons, 1996)

1.1 Introduction

While they have disappeared in Europe, dowry payments still exist in South Asia.[17]

Not only do they still exist but also it has been reported that these payments have

been increasing since the 1950s.[18] Moreover, although originally dowry was given

by the bride's family and remained in possession of the bride, it is reportedly now

received by the groom or the groom's family.

In this chapter, we examine dowries being paid in marriages held during 1931-

1996 in the Matlab region, a rural sub district in Bangladesh, using retrospective

marriage information from household survey data gathered in 1996. We find that the

incidence of dowry has substantially increased, especially since the 1970s. Nonethe-

less, we fail to find increasing dowry payments: in particular, the average dowry in

real terms has been decreasing since the 1950s.

We present evidence that the so-called rise in dowries is only an incidence rise,

and that this is mainly a Muslim phenomenon. In particular, while only 4% of the

Muslim couples in our sample who got married in the 1960s received a dowry, this

figure rose up to 60% in the 1980s. The hypothesis in this paper is, to our knowl-

edge, new in the literature, and it is that dowry (in particular for Muslims in rural

Bangladesh) functions as an insurance against divorce. We argue that the dramatic

increase in dowry participation in the Matlab region is due to the fact that, by giving

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[17] Despite being forbidden or limited by law: Dowry Prohibition Acts were passed in 1961 in India and 1980 in Bangladesh. In Pakistan the Dowry and Bridal Gifts Act of 1976 limits dowry payments.

[18] See e.g. Caldwell et al. (1983), Rao (1993), and Billig (1992) for India.

the groom a dowry, the bride's parents insure themselves and their daughter against their daughter's divorce, as the husband, who is nevertheless the dowry's recipient, would have to refund the dowry in order to exercise (unilateral) divorce.

In rural Bangladesh, marriage is the only true vocation for women. Women get married at an early age. After marriage, brides usually leave their parents' house for the groom's house, where they under the authority of the husband and in-laws. Once they are married, the possibility of divorce is different for Muslims and Hindus, as the concept of marriage itself is different. Marriage among Muslims is civil and contractual, whereas it is sacramental and eternal for Hindus, and therefore the are no provisions for divorce under Hindu law.

In this context, we argue that parents are increasingly providing their daughters' marriage with a dowry, in order to minimise the probability of their daughters' divorce and subsequent abandonment, whose return to the parental home would not only raise their living costs but also jeopardise their position in the community. The higher the dowry they give, the more difficult it would be for the husband to divorce, as a bigger amount has to be returned.[19]

We find support for the insurance hypothesis from a variety of sources. The identification strategy makes use of religious affiliation and geographical origin of

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[19] Dowry should not be confused with dower, which is a sum that under Islamic law a Bangladeshi woman can claim, to be given to her when she marries or in case of divorce (although usually not requested), see Kamal and Ahmer and Naher (1987). We believe that the rise of dowry is precisely related to the husband's failure to comply with dower obligations stipulated in the marriage contract, and the lack of judicial enforcement of this obligation (see the Background Appendix for a detailed analysis of Islamic law and women's rights in Bangladesh).

the spouse. First we run regressions revealing that *ceteris paribus* the probability of remaining married is higher, the higher the dowry that was paid by the bride's parents. This is statistically significant for Muslims, but it is not significant for Hindus. Second, we find additional support for the insurance hypothesis from the fact that a couple was more likely to receive a dowry if the spouse came from the same village, in which case an insurance against divorce would be less needed. Again, this holds for Muslims only. Third, we find that couples were likely to be given higher dowries in case the groom came from outside the village.

The timing of the start in the dramatic increase in dowry participation by Muslims coincides with the enactment of the Muslim Marriage (Registration) Act in 1974 (which made registration of marriages compulsory), as in being a proof of marriage, it may have served to enforce the dowry refund or at least to strenghten the woman's legal position.

Examination of the dowry amount in real terms provides some evidence that wealthier parents, either Muslims or Hindus, provide their daughters with higher dowries. Finally, we suggest that the observed average decrease in dowry in real terms may be related to the fact that poorer households are gradually joining the dowry system since the 1970s. In fact, we find that literate Muslim grooms and brides are less likely to participate in the dowry system. If dowry is functioning as an insurance against divorce, it makes sense that the dowry refund is not going to

be binding for more educated and wealthier grooms, who would have no economic difficulty in refunding the dowry.

Additionally, Muslim women are less likely to get a dowry if they had received inheritance. The correlation is significant for Muslims post-1975, but not for Hindus, and neither it is for Muslims before 1975. That is, Muslim parents who provide inheritance to their daughters do not endow them with dowries.

In recent times, incidents of dowry violence, or dowry deaths, have become well known whereby a husband keeps extracting resources from the wife's family and eventually hurts or kills her in case her family fails to comply with his demands. We do not undervalue this violence, but rather argue that the source of this violence or mistreatment of women is not dowry itself, but the vulnerability of rural women in a legal and social systems that favour the male and provide no outside option off marriage.

The organisation of the chapter is as follows. Section two describes some related literature. In section three we describe the household data and the region where these were gathered. In section four we turn to the empirical evidence. In section five we discuss enforcement issues. Finally, section six concludes and discusses some policy implications regarding dowry payments in rural Bangladesh.

1.2 Related literature

Even though the economic literature on dowry is not nearly as extensive as the socio-logical and anthropological literature, economists have previously tried and assessed (1) why dowries have arisen, (2) why dowries have increased in South Asia, and (3) what the relationship between dowry and the wife's welfare is. Thus we can distinguish three types of literature: the *existence*, the *increase*, and the *welfare* approaches.

In the *existence* approach there is the seminal work of Becker (1991), who argued that in the presence of indivisibilities marital transfers appear to clear the market. In this context, dowry would be the difference between the joint value of the marriage and the utility of the husband if he were to remain unmarried. We distinguish two main motives for dowries, the groomprice and the inheritance motives. The former motive is implicit in Rao (1993), who models dowry (using Rosen's (1974) implicit market model) as the price resulting from a nonlinear hedonic dowry function that maps differences in the traits of potential brides and grooms, and in Rajaraman (1983), who describes dowry as a compensatory payment for the groom's side. According to the latter motive, dowry serves as a pre-mortem bequest. On the one hand, Botticini and Siow (2003) argue that in virilocal or patrilocal residential settings, where brides typically go to live with the husband's household of origin, dowries are given to daughters at the time of marriage to discourage them from claiming a property share at the time of the father's death, a possibility that would lead the

son to exert too low an effort in the household property. Hence dowries would avoid free-riding among siblings by making the son the residual claimant of the property. Edlund (2001) in contrast argues that the need for a dowry arises due to sex asymmetries in fecundity: parents would like to bequeath on children at their offspring, but at that point daughters may no longer be fecund. Anderson (2004) uniquely models together both the groomprice and inheritance approach and finds that dowry is one or the other according to different stages of the development process: while dowry as inheritance only is consistent with low development stages, as the relative heterogeneity of men relative to women increases with development, in equilibrium a second price instrument (dowry as a groomprice) must arise. Finally, and related to the *welfare* approach, Zhang and Chan (1999) treat dowry as a pre-mortem bequest arguing that dowry would remain under the wife's property (and would be given back to the wife in case of divorce).[20] Using data from Taiwan, they find that a higher dowry would tend to increase the wife's welfare.[21] Brown (2002) also finds a positive relationship between dowry and several indicators of the wife's welfare in rural China.

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[20] There is evidence that this is the case for Nepal (Ekvall 1968). While the fact that dowry must be refunded in case of divorce is also true for rural Bangladesh, the evidence seems to be that dowry does not remain under the wife's property.

[21] The idea of dowry as female inheritance was first introduced by Goody (1973) in the context of Eurasia, and Tambiah (1973) for South Asia; it is also mentioned by Chen (1985) for China. Freedman (1970) and Chen (1985) argue that dowry in contemporary China remains under the control of the bride. However East Asia and South Asia would be different in that brideprice and dowry can be observed at the same time in the former, while in the latter, at least for India and Bangladesh, a reversal from brideprice to dowry has been observed in the twentieth century (Caldwell et al. 1983, Amin and Cain 1995, Zhang and Chan 1999). Also, there is no evidence of brideprice in Bangladesh since the 1940s (Amin and Cain 1995). Therefore the study of Zhang and Chan (1999), while sensible for East Asia would not apply to South Asia.

In the *increase* approach we distinguish two main hypotheses. First, some authors argue that the increase in dowry payments in modern India is due to increased competition for eligible males. Among this first argument, there is the *marriage squeeze* argument, which was first suggested by anthropologists.[22] Using ICRISAT data from six villages in South-Central India, Rao (1993) argues that dowries have risen due to an increase in the ratio of the number of females of marriageable age to the number of males of marriageable age: in the context of population growth, the age gap at marriage implies younger brides, that is, *higher quality* brides, so that increased competition would shift the price function upwards. According to this interpretation, families of older brides woud be willing to outbid the younger,[23] hence implying a reduction in the marriage age gap.[24] Second in this competition argument, Anderson (2003) argues with a theoretical model that the reported increase in dowries in India would be given by modernisation (understood as an increase in wealth and an increase in the dispersion of wealth) in the context of a rigid caste-based system with hypergamy.[25] In the second hypothesis, Edlund (2000, 2001) argues that dowries have increased in India due to economic growth.

In rural Bangladesh, participation in the dowry system was already substantial for Hindus in the 1950s, but it was not until the 1970s that participation by Muslims

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[22] See Caldwell et al. (1983).

[23] For more information on the topic of marriage squeeze in India, see Bhat and Halli (1999).

[24] Using the same data set, Edlund (2000) is unable to replicate Rao's findings; Rao (2000) argues that this disparity may be due to differences in the definitions of state boundaries. In summary, the empirical evidence on the marriage squeeze for India is sensitive to the econometric specification.

[25] In a society where an hypergamous marriage is allowed, the woman can marry up in status/caste but not down.

was sizeable. The process whereby the dowry custom has spread from higher to lower castes (in India) or classes (in Bangladesh) has been called *Sanskritization* meaning an imitation of the higher by the lower classes (Srinivas 1957).

Lindenbaum (1981) analyses the evolution of marriage transactions over time in an area in the Comilla district in Bangladesh. She describes the reversal from brideprice (whereby the transfer is from the groom's to the bride's side, also called bridewealth[26]) to dowry, which has occurred since the 1950s, as the consequence of social and economic changes. She claims that this reversal cannot be attributed to a particular religious group, as dowry has recently been practiced both by Muslims (who constitute a majority in Bangladesh), and Hindus. Regarding the amount of dowry that has been given, the author reports increasing nominal dowries, but unfortunately does not explain the evolution of dowry in real terms. To our knowledge the only quantitative study of dowry in Bangladesh, Amin and Cain (1995), examines payments in two villages in northern rural Bangladesh, and report an increasing incidence of dowry and a rise in the real amount of the dowry being paid. They mention that while the practice of dowry among Muslims in Bangladesh is recent, it was common among certain high-caste Hindus. While they do not run any econometric test, they claim that the increase is due to a rise in the eligible sex ratio (the number

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[26] Goody (1973).

of eligible females to the number of eligible males),[27]that is, the so-called marriage squeeze.[28]

The law on marriage in Bangladesh is governed by the personal laws applicable to each community – Buddhist, Christian, Hindu, Muslim, Parsi or Sikh – and relevant statutory modifications. Marriage registration is compulsory for Muslims under the Muslim Marriages and Divorces (Registration) Act, enacted in 1974 in order to strengthen the inducements for civil registration. Although there is no legislation to this effect, there is a customary trend in Bangladesh towards encouraging the insertion of stipulations relating to delegated divorce in the marriage contract. Registration of marriages was rare before this law was passed, but a majority of families is currently believed to register their daughters' marriages.[29] No similar registration law exists for Hindus in Bangladesh.

Consequently with the respective concepts of marriage, divorce for Hindus is extremely rare, while it is more feasible for Muslims (see details about Muslim family law and legal rights of women in Bangladesh in the Background Appendix). Under Islamic personal law there are several types of divorce, but it is unilateral irrevocable divorce by husbands (*talaq al-bidah*) which is allegedly the most common in rural areas. Even though Muslim marriage is not sacramental, divorced Bangladeshi

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[27] While the convention for the sex ratio is to divide the number of males by the number of females, in this paper we follow Rao (1993) and related literature in using females to males for the sake of comparison.

[28] Anderson (2000b) analyses current dowry payments in Pakistan, a country with a majority of Muslim population, and finds evidence consistent with the pre-mortem inheritance motive in rural areas.

[29] MHSS questionnaire (Rahman et al 1999b).

women are usually stigmatised: after marital disruption, return to the parental home is not respectable by the community, and may be especially difficult if parents are deceased or in poverty. As a result, divorced women are socially disgraced and hence all brides are expected to try their best to make their marriage a success (Bhuiya and Chowdhury 1997). Hence, although divorce rates in Bangladesh are typically low, the possibility of being divorced by the husband is feared. In fact, this explains institutional concerns with unilateral irrevocable divorce (see the Background Appendix for more details). Furthermore, as mentioned by Ahmed and Naher (1987), since marriage in Bangladesh is regarded as being the only true vocation for women in society, a single, or divorced, working woman is not accorded equal status to that given to a married woman.[30]

There are two traditional marital transfers in rural Bangladesh. The first of them, dower (*mehr*, or *mahr*), is Islamic in nature and constitutes a protection against utter destitution should she lose her husband through separation or death. The sum can be claimed by her either when she marries or in case of divorce. However, this payment is not usually given, and many women are unaware of this right. In sum, dower is, as Amin and Cain (1995) point out, seldom of any real significance. In contrast, dowry (*joutuk* or the English word *demand*), is a (customary) transfer from the bride's family to the groom and his family, and is not directly related to Islamic personal law. Even though brideprice (*pawn*) existed in Bangladesh during the first

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[30] This is the case in other South Asian countries as well, e.g. India (especially Northwestern India, see Drèze and Sen 1995) and Pakistan.

decades of the twentieth century, whereby the transfer was made from the groom's to the bride's side,[31] dowry payments have been reported since at least the 1940s. In this study we do not focus on the change from brideprice to dowry, which involved only the Hindu minority,[32] but on the evolution of dowry from approximately the 1940s on, especially focusing on payments made by the Muslim community, who constitute roughly 90% of the Bangladeshi population. The Dowry Prohibition Act of 1980 prohibits dowry payments in Bangladesh. Not only is this law often unknown and very frequently not observed, especially in rural areas, but also its usefulness is questionable, as the time it stipulates for dowry cases is only one year.[33]

Dowry violence has been modelled by Bloch and Rao (2003), who use data from rural India and find empirical support for the hypothesis that violence against wives is negatively related to dowry payments.[34]

What is dowry in rural Bangladesh? If dowry constitutes a mere groomprice, so that increased female competition for males due to either a marriage squeeze (Rao 1993) or higher male heterogeneity in the context of stratification (Anderson 2003, 2004, Gaulin and Boster 1990), which results in dowry inflation, then this infla-

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[31] The change from brideprice to dowry has been extensively studied for India (Caldwell et al. 1993).

[32] Jahan (1988).

[33] There is some confusion between dowry and dower in some sources. Dower is provided for under Muslim law (Muslim Family Laws Ordinance), and is supposed to protect the wife. Disputes over dower are brough to family courts. However as mentioned above especially in rural areas dower is reported not to be given. Dowry, as it is beyond the Islamic marriage contract, is mainly demanded through oral agreement.

[34] So-called dowry deaths have been reported by the media, first for India and also for Bangladesh. Dowry-related violence in Bangladesh in 1997 constituted, though, only 11% of total violent incidents against females, as reported by the police (Yasmin 2000). The number is similar in other studies, but of course there may misreporting of cases, by claiming fake suicides and mortal accidents.

tion can be seen as a welfare loss to the bride. However, if dowry is nevertheless a pre-mortem bequest, then dowry inflation could be due to wealth accumulation and hence, it may reflect an underlying welfare increase (Edlund 2000).

Interestingly, Simmons (1996) undertook interviews with women from rural Bangladesh who reported that a dowry makes it more difficult for husbands to make use of unilateral divorce: "once the dowry has been paid, a woman's position may be strengthened because *the husband cannot drive her out of the house so easily. To do that he would have to pay back that money first*", an argument that gives support to the inheritance hypothesis in this study.[35]

1.3 Description of the data

The data used in this study comes mainly from the Matlab Health and Socio Economic Survey (MHSS). The MHSS is a collaborative effort of RAND, the Harvard School of Public Health, the University of Pennsylvania, the University of Colorado at Boulder, Brown University, Mitra and Associates and the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).[36] The Main sample in this household survey, which is the sample that we use for our analysis, gathers information from interviews performed in 1996 to 27,009 individuals in about 4,364 households in 2,687 baris or residential compounds in Matlab, a rural subdistrict (*Thana*) in

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[35] Under customary law, dowry/brideprice is refundable upon divorce for Muslim communities in other countries too (e.g. Sierra Leone), and non-Muslim countries (e.g. Taiwan).

[36] For more details see Rahman et al (1999a).

the nowadays Chandpur Zila (Chittagong division) of Bangladesh. As Phillips et al.

(1988) point out, Matlab has remained predominantly traditional and religiously con-

servative even though some modernising influences have reached the area since the

1980s—through widespread access to radios, growing emphasis on education, and

increasing contact with urban areas. Like much of Bengal since the 1970s, economic

deterioration, famine, and political upheaval have profoundly affected the area, pre-

venting the development of towns, and slowing the introduction of modern amenities

and social services, which has perpetuated poverty. Subsistence agriculture and fish-

ing dominate the economy, with trade and commerce hampered by the absence of

roads, electrification, communication, or ready access to markets.

Information about the (nominal) amount of dowry is reported by more than

2,000 households, however some of these do not report the year of marriage and

hence these nominal observations cannot be deflated.[37] Dowry typically consisted of

one or more of the following items: cash, jewellery, furniture or household items,

land, bicycle, boat, rickshaw or van, TV, radio, cassette player, clock or watch, cow

or goat. The usable sample consists of 855 observations of female-reported dowry

and 340 of male-reported dowry, which gives us information on the amount of dowry

for 1,015 couples. Different parts of the questionnaire were given to different family

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[37] We use the price of rice as a deflator (Khan and Hossain 1989, Amin and Cain 1995). See the Data Appendix for details about the construction of the deflator.

members; in particular in the sample there are 171 cases of couples where the two spouses report the dowry amount.[38]
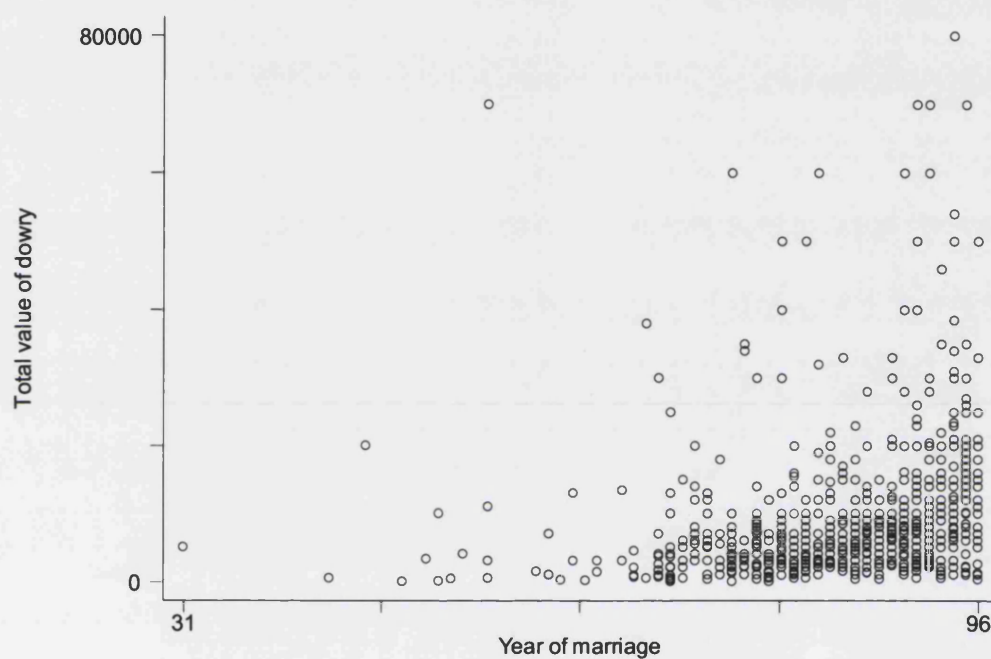
Figure 1.1 Evolution of dowry in nominal terms

The average dowry paid for marriages held in 1996 was 12,700 Taka, which corresponds to approximately 62% of the average annual gross income earned by a couple.[39] Figure 1.1 depicts the evolution of dowry in nominal terms over time, while Figure 1.2 depicts the evolution of dowry in real terms: although there is a

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[38] Since dowry is more often reported by women we use the female reported dowry when both ara available.

[39] The average annual gross income earned by females (males) in 1995 is 960 (19,700) Taka.

clear increasing pattern in nominal dowry, there is no clear pattern for dowry when increases in the price level are considered.
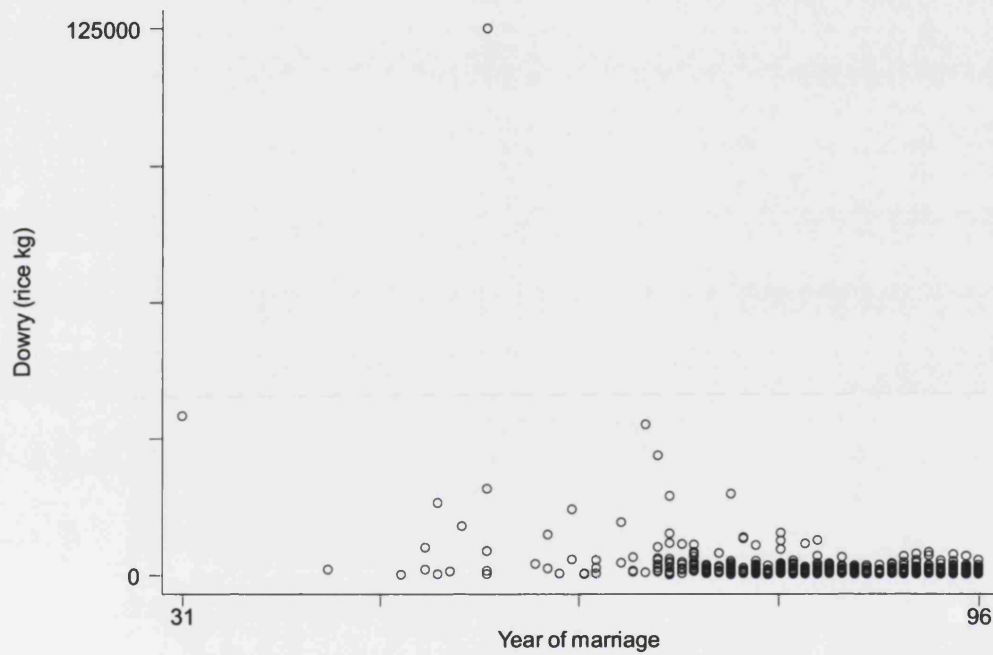
Figure 1.2 Evolution of dowry in real terms

There is as well information on whether a dowry was given or not in the marriage: this is available for 6,347 couples. Again, when we take into account the availability of the year of marriage the usable sample drops further, this time to 2,098 couples. When considering other variables in the picture, we are left with fewer observations.[40]

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[40] McCarthy et al. (1978) explains how individuals and especially women in rural Bangladesh only

Bangladeshi demographic and macroeconomic variables of interest such as the number of males and females by age are available from various census issues: Census of British India for 1931-48, Census of Pakistan for 1949-67, and Census of Bangladesh for 1968-96 (see the Data Appendix for details).

Table 1.1 provides decade-by-decade averages for some variables of interest. Every observation corresponds to a couple. The first interesting aspect is that, as opposed to the Indian case, dowry has not been steadily increasing; rather it has been recently decreasing. The dramatic increase in the incidence of dowry from the 1970s can be explained as a Muslim phenomenon as can be seen by splitting dowry incidence by religious group: over 40% of Hindu marriages in the 1950s were given a dowry, compared to approximately 2% of Muslim marriages (Table 1.1).

Table 1.2 provides descriptive statistics for several variables of interest. The average real dowry over the period is 1,392 rice kg, with a standard deviation of four times that figure. Literacy rates in our sample are 44% and 34% for men and women respectively. Divorce/separation rates, as expected from the nature of both concepts of marriage for Muslims and Hindus, are higher for Muslims (9% of males and 8% of females) than for Hindus (2% and 1% respectively). 8% of spouses belong to the same extended households (lived in the same *bari*, or compound), while in 13% of

have a rough idea of their actual year of birth—explaining the fact that the year of marriage is missing for many individuals.

couples, both spouses were from the the same village. About 4% of husbands report having more than one wife.[41]
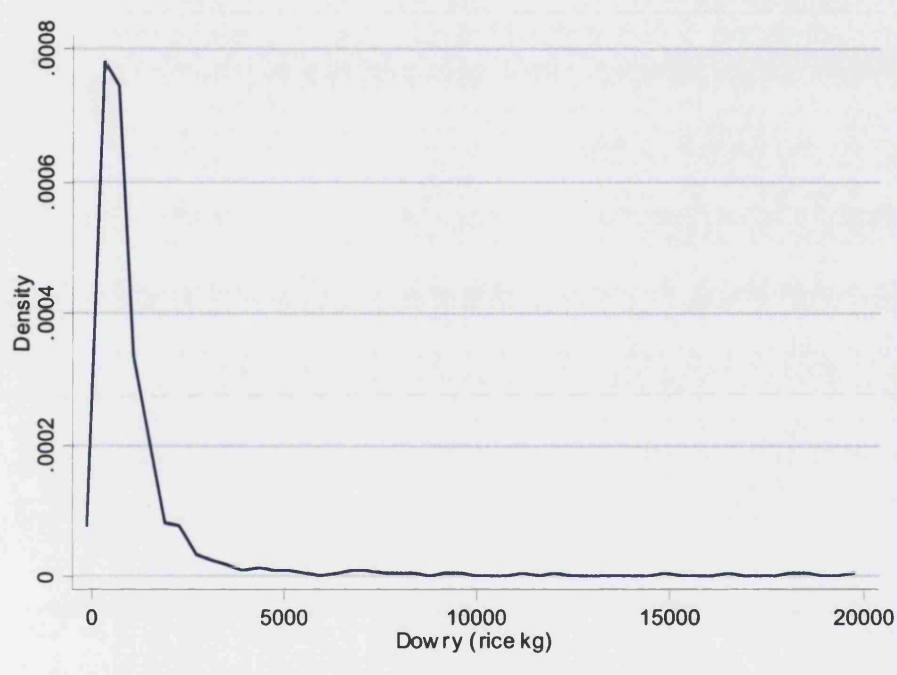
Figure 1.3 Kernel density estimate of real dowry payments 1931-1996

Figures 1.3 and 1.4 show the kernel density estimate of dowry payments. Figure 1.3 uses the real amount for the whole sample (but from a few observations where dowry is larger than 20,000 rice kg), while Figure 1.4 shows the nominal amount for the last five years in the sample, which is roughly comparable. It can be seen that most dowries are of relatively low value.

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[41] Islamic law allows for up to four wives, provided certain conditions are met.
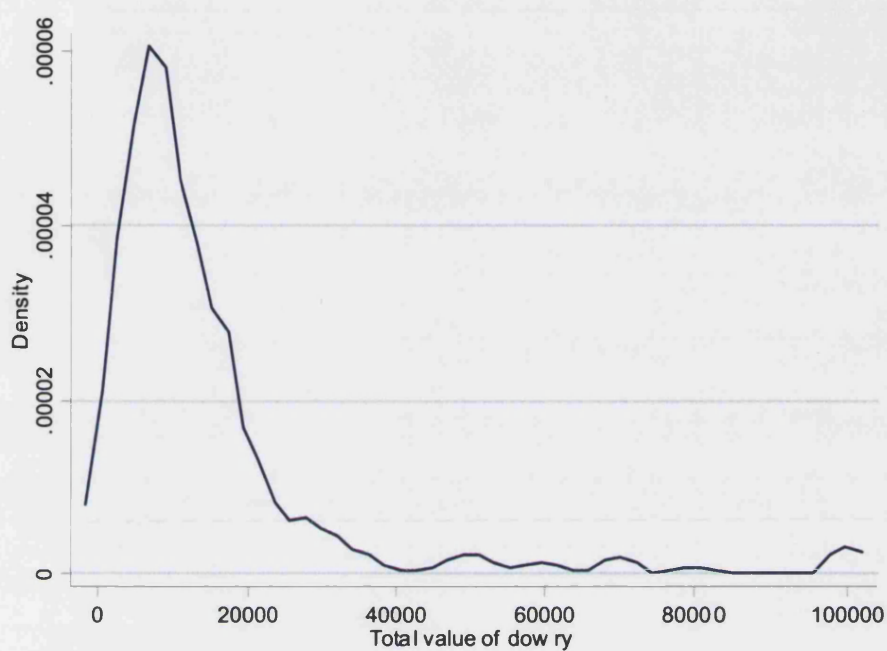
Figure 1.4 Kernel density estimate of nominal dowry payments in 1992-96

1.4 Empirical evidence

The empirical analysis consists of four parts. In the first section, we directly test our main hypothesis: that dowry is an insurance against divorce for Muslims in rural Bangladesh. For this, we explore the probability of remaining married of Muslims and Hindus. In the second part, we estimate dowry payments taking into account that there is a selection issue, namely that the decision of participating in the dowry system might be different from the decision about the amount of dowry given. We

then also test the insurance motive by analyzing effect of the geographical origin of the spouse (whether it is the same *bari*, village, or another village) on both the likelihood to participate in the dowry system and the amount paid. In particular, if a dowry is given in order to protect a daughter from abandonment by her husband later on, we expect that this insurance is more necessary in the case where the groom is from another village. In rural Bangladesh, where the bride moves to the groom's household at the time of marriage, her parents are less able to encourage any sort of social sanction against the groom if they live in another village. Therefore, it makes sense that the husband's social cost of abandoning his wife is greater if her family resides in the same village. Finally, in the fourth part we look at the substitutability between dowry and inheritance to daughters.

Throughout the entire section, standard errors are estimated with the robust option and are clustered at the extended household level.[42] This relaxes the independence assumption of the estimator to being just independent between clusters.

1.4.1 Probability of remaining married

Identification and estimation

The main hypothesis in this study is that dowry functions as an insurance against divorce for Muslims. The intuition is that a husband who has been given

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[42] For a few extended households we have more than one couple in the sample. We cannot cluster standard errors at the village level because the village code has been scrambled from the data for confidentiality reasons.

a dowry does not find it as easy to unilaterally divorce his wife because in that case he would have to refund the dowry he was given.[43] If this is true, then the larger the amount of the dowry payment the husband has received, the larger the probability that he remains married (that is, the more binding it is the refund constraint). The same should be true for wives, as their probability of being divorced/abandoned should be lower the larger the dowry their marriage was provided with. The identification strategy is based on two characteristics: religious affiliation and geographical origin of the spouse.

On the one hand, and as previously explained, marriage is sacramental for Hindus—unilateral divorce is not specified under Hindu law as it is for Muslims, and henceforth the dowry refund argument would not apply for this group. Therefore the first strategy lies in comparing both religious groups. On the other hand, if dowry is an insurance against wife abandonment, it makes sense that such an insurance is more needed when the spouse comes from further away. For instance, if the daughter is marrying someone belonging to the same extended household,[44] or if the groom is from the same village, a dowry may be less necessary than if the daughter is marrying a groom from outside the bride's village, because the husband's social cost of abandoning a wife is greater if her family resides in the same village.

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[43] One of the reasons may be imperfect credit markets in rural Bangladesh.

[44] Marriages among individuals belonging to the same extended household are not rare in the sample, e.g. uncle and niece. These individuals were usually residing within the same *bari* (Bangladeshi compound) before the wedding.

Hence we estimate:

$$M_i = \alpha D_i + \xi X_{M_I} + \varepsilon_{M_i}$$

where M is equal to one if the individual is still married and equal to zero if he or she is divorced or separated, D is the dowry amount in real terms (rice kg, see Data Appendix), the vector X_M contains other determinants, and i denotes couples. We estimate separate equations for males and females and present the results in Tables 1.3 and 1.4.

According to the insurance hypothesis we expect that $\alpha^{Muslim} > 0$, but $\alpha^{Hindu} = 0$. Also, we would expect divorce rates to have decreased since 1975.

Results

Table 1.3 presents probit estimations of the probability of remaining married for Muslims and Hindus separately. Notice that even though marriage is a sacramental concept for Hindus and there are no divorce stipulations, as opposed to Islamic law, there are some marriage breakups (in particular, divorce/separation rates in our sample are 1% for Hindu women and 2% for men). In fact, in the subsample of Hindu women for which we have data for dowry too, we cannot run a corresponding regression due to lack of separation observations, but we are able to do so for Hindu men.

Controlling for whether the marriage was arranged (we expect arranged marriages to be more successful as these do not encounter ostracism in the community)[45] and a year of marriage trend, we find that the probability of remaining married is statistically larger the larger the dowry, for both Muslim men and women, while it is not significant for Hindu men. As argued before, this is consistent with the insurance hypothesis. Regarding the size of the effect, we can interpret the coefficients by looking at the increase in the probability of remaining married as a result of being given the average dowry. The average dowry in real terms is equivalent to 1,392 rice kg. In that case, the probability that a husband does not divorce is 10% larger than without any dowry. If the dowry were say 2,500 rice kg, then this probability is increased by 18%. Regarding women, their probability of remaining married is also increased with a larger dowry: the average dowry increases their chances by 3.2%, while this figure is 6% for a 2,500 dowry. The figure is modest for the average dowry, but it can be impressive for larger values. There are a few observations for which dowry is larger than 20,000 rice kg. For women with these dowries, the probability of being divorced drops by more than 50%. All in all, Muslim men and women are more likely to remain married if they get a dowry, even if this is not large, and the effect can be very big for big dowries.[46]

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[45]   15.6% of males report having married someone of their own choice, while the corresponding figure is only 1.4% for females.

[46]   The estimation includes observations for which the dowry amount is known, but we do not include the zeros in case we know there was no dowry. The reason for this is that that would imply to assume that the participation decision and the amount decision are the same, while the evidence in the next section will prove that this is not the case.

In Table 1.4 we are able to use more controls and analyse the role of geographical origin of the spouse.[47] In columns (1) and (2) we regress the probability of remaining married on some traits of both husband and wife: literacy, age at marriage, whether the spouse was the parents' choice, a year of marriage trend and a dummy for whether the marriage was held after 1975. We also include dowry, and whether the spouse is from the same village (which includes the extended household level, and the village level itself). We find that, as in Table 1.3, the larger the dowry, the higher the probability of remaining married for both men and women. Other interesting effects are the fact that her literacy is not significant if we control for dowry, and the fact that brides who were older when they got married are more likely to remain married, while men are more likely to remain married to women who married at a younger age. The eligible sex ratio is negatively related to a wife's probability of remaining married, suggesting that increased competition for males is related to more marriage wives getting divorced. Finally, couples who got married more recently are more likely to remain together.[48]

Finally, if the insurance hypothesis is true, and if participation in the dowry system is indeed deterring divorces, we expect the percentage of divorced people to have been lower from the late 1970s on, when dowry participation across Muslims

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[47] Data availability for the Hindu minority prevents us from doing the same exercise for Hindus only.

[48] Incidentally, the evidence that couples that received a dowry are more likely to remain married could also be understood as evidence that dowry is a search device in as much as a dowry helps bringing better matches in a bargaining setting. However, the fact that the probability of remaining married increases with the amount of dowry controlling for arranged marriages, and especially that this relationship is only significant for Muslims, provides support to the insurance hypothesis.

escalated (and coinciding with the Muslim Marriage and Divorce (Registration) Act, introduced in 1975).
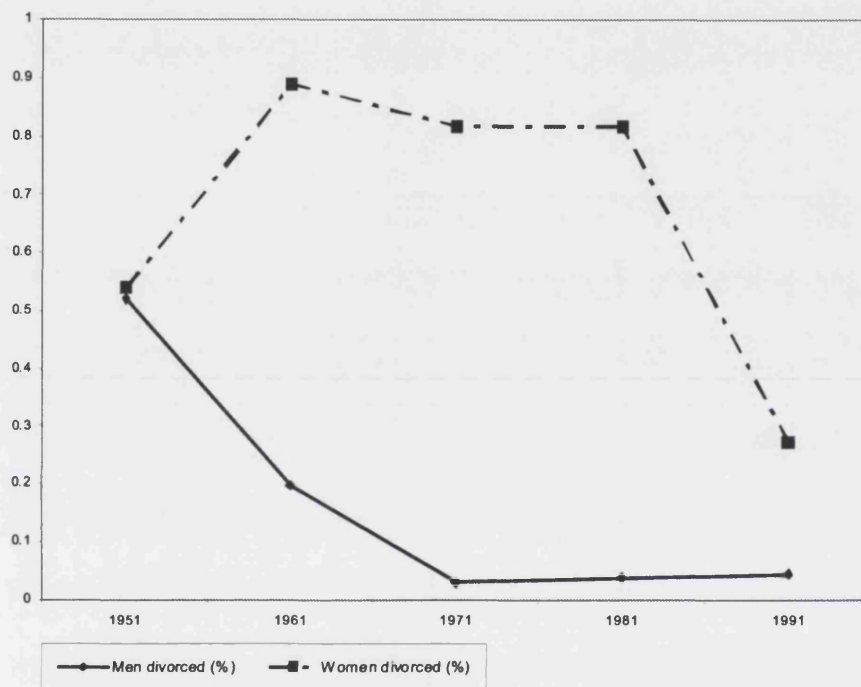
Figure 1.5 Female and male divorce rates, Comilla district, 1951-1991

Figure 1.5 shows the percentage of divorced women and men over 1951-1991 in the Comilla district, where Matlab Thana is. These numbers are calculated as the percentage of divorced women (men) out of the total population above 10 years of age. The percentage of divorced men has decreased since 1951, when this was similar to the percentage of divorced women, but the latter increased in the 1950s and remained high until 1981, and has impressively declined over the 1980s. This is

consistent with higher increased participation in dowry since the late 1970s, with an effect lagging a few years.[49] However, these numbers should be taken with caution, as official divorce rates are likely to be undermeasured (in our sample, there are about 7-8% of individuals divorced or separated; see Table 1.1), we would get rates closer to the real ones in this figure if we were to take 15 years of age as cut-off, but this is not possible. The decreasing trend is nevertheless of interest, because there is no obvious reason for which we would expect the undermeasurement problem to increase recently and only for women.

1.4.2 Dowry amount and dowry participation

Identification and estimation

In this part, we test our insurance hypothesis by taking advantage again of the geographical origin of the spouse. In particular, if a dowry is given in order to protect a daughter from abandonment by her husband later on, we expect that this insurance is more necessary in the case where the groom is from another village. In rural Bangladesh, where the bride moves to the groom's household at the time of marriage, her parents are less able to encourage any sort of social sanction against the groom if they live in another village. Therefore as previously mentioned it makes

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[49] Unfortunately we do not have marital status information by religious group, therefore the graph includes Muslims and Hindus. However, since Hindus represent just 10% of the population, this can be assumed to be a largely Muslim phenomenon.

sense that the husband's social cost of abandoning a wife is greater if her family resides in the same village.

We only observe the value of dowry in case that a person/household has decided to participate in the dowry system, so that it could be that the dowry amount is incidentally truncated. As long as the determinants of dowry participation and the dowry amount given might be different, we need to control for selection in the dowry amount equation. People who received dowry payment larger than zero are only a 31% of the sample and, as is well known, estimates from self-selected samples may be biased due to correlation between independent variables and stochastic disturbances induced by the sample selection rule. In this case the framework is Heckman's (1979) maximum likelihood estimation.[50] We can write the dowry amount equation as:

$$\log DA_i = \beta_{AB}Bari_i + \beta_{AV}Village_i + \phi_A X_{Ai} + \sigma_P \lambda_P + \varepsilon_{Ai} \qquad (1.1)$$

while the selection equation would be

$$Z_i\gamma + u_{Pi} > 0$$

where $\varepsilon_{Ai} \backsim N(0,\sigma)$ and $u_{Pi} \backsim N(0,1)$ and $Corr(\varepsilon_{Ai}, u_{Pi}) = \rho$ which in our case practically implies to estimate the following selection equation:

$$\beta_{PB}Bari_i + \beta_{PV}Village_i + \xi Post1975 + \phi_P X_{Pi} + \varepsilon_{Pi} > 0 \qquad (1.2)$$

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[50] This estimation strategy is preferred to a Tobit model with the dowry amount and zeros corresponding to couples not participating in the dowry system. The reason is that including both types of information convolutes the dowry amount decision and the dowry participation decision. For similar models (e.g. women's working hours and women's labor force participation decisions) the Tobit model has been rejected (Cogan 1980, Mroz 1987).

where DA denotes the dowry amount received by couple i, $Bari$ is a dummy variable equal to one if the spouse comes from the same *bari* or compound (in practice, extended family), and zero otherwise, $Village$ is a dummy variable equal to one if the spouse comes from the same village (but not the same *bari*), and zero otherwise, λ_P is the inverse Mills' ratio from the estimation of (1.2), X_A and X_P are other controls for the dowry amount and dowry participation respectively, and finally $Post1975$ is a dummy variable equal to one if the marriage was held since 1975 and equal to zero if it was held before.

In particular, we can test different dowry hypotheses with the estimation of (1.1) and (1.2):

Groomprice motive: if dowry is a groomprice, then we expect that $\beta_{kB} < 0$ for $k = \{A, P\}$, holding constant the quality of the groom and bride. The rationale is that groomprices are less commonly paid, or less paid, when the groom belongs to the same extended family (e.g. Cadwell et al. 1983).

Inheritance motive: if alternatively dowry constitutes a pre-mortem bequest, we expect that $\beta_{kB} > 0$ for $k = \{A, P\}$.

Insurance motive: if dowry is an insurance against divorce for Muslims, we expect that $\beta_{kB}^{\text{Muslim}} < 0, \beta_{kV}^{\text{Muslim}} < 0, \beta_{kB}^{\text{Hindu}} = 0, \beta_{kV}^{\text{Hindu}} = 0$ for $k = \{A, P\}$. That is, an insurance is more necessary when the groom is from outside the village, but this is only true for Muslims.[51] Furthermore, if the enactment of the Muslim Marriage

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[51] It could be argued that a higher dowry for grooms from outside the bridal village is also consistent with the groomprice model. This would be the case if by marrying outside the village a higher quality

(Registration) Act in 1975 has something to do with participation, we expect that $\xi^{Muslim} > 0$ but $\xi^{Hindu} = 0$.

Results

We estimate equations (1.1) and (1.2) clustering robust standard errors at the extended household level and present the results in Tables 1.5 and 1.6. Results are presented for all observations in the first column, while these are split by religion in columns (2) and (3) for Muslims and Hindus respectively.

In Table 1.6 we present the results of estimating the participation selection equation. First of all, while we cannot reject that $\rho = 0$ for the pooled estimation and for only Hindus, we can reject that $\rho = 0$ at the 1% significance level for Muslims. This means that, for Muslims, the participation decision and the dowry amount decision are different, while we cannot reject that these decisions are of the same nature for Hindus.

The estimation provides some support for the insurance hypothesis: we find $\beta_{kP}^{Muslim} < 0$, while we cannot reject that $\beta_{kB}^{Hindu} = 0, \beta_{kV}^{Hindu} = 0$ for $k = \{A, P\}$. Although some of the coefficients are not highly statistically significant, the Wald tests indicate that we can reject that the Muslim and Hindu coefficients are the same with 9% and 17% significance respectively. However, we fail to find that $\beta_{kB}^{Muslim} < 0$ for $k = \{A, P\}$. That is, although Muslim couples tend to both participate less and

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groom could be fetched. In order to rule out this interpretation, we control for the quality of the groom, that is, there is no apparent reason for which a groom from outside the village with the same quality as a groom from the bridal village should be more expensive. Second, whether this effect is stronger for Muslims should make less appropriate the quality explanation.

get less dowry if the spouse comes from the same village while Hindu couples do not, that is not true for Muslim couples whose spouse comes from the same *bari*. Since we also find no evidence for $\beta_{kB}^{\text{Muslim}} > 0$, one possibility is that both the inheritance and the insurance motives are playing a role: in that case, it could be that both effects cancel each other and hence we do not observe $\beta_{kB}^{\text{Muslim}}$ to be different from zero. In fact, these hypotheses do not exclude each other. However, we fail to find more support for the female inheritance motive in the sense that $\beta_{kB}^{\text{Hindu}}$ is not significantly different from zero either. Additionally, we find evidence consistent with the association of the Muslim Marriage Registration Act 1975 and dowry participation: the dummy for post-1975 is positively significant only for Muslims (in fact it is negatively significant for Hindus: *ceteris paribus*, participation has been lower after 1975).[52] This is consistent with the idea that parents of brides would provide a dowry in the context of increased registration, which would have been made more aware thanks to the act. We do know from the interviewed responses in the data set that interviewees are aware that registration makes it possible to have a proof of marriage, and that they see registration as useful for the refund of dowry by the husband in case or abandonment (i.e. unilateral divorce).[53] In sum, these estimates lend some support for the insurance motive. However, we find no support for the groomprice motive: al-

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[52] Ideally, we would use information about the registration status of the marriages in the sample. Unfortunately, marriage registration was not enquired into in the survey.

[53] The particular question in the MHSS questionnaire is: *In the past, most marriages were not registered. These days a majority of the people register their daughters' marriages. What is the benefit of registering a marriage?* (Rahman et al. 1999b). The most cited responses inolve legal benefits in general, impossibility for the husband to take a second wife, *dowry refund*, and finally being less beaten by the husband.

though literate Muslim grooms tend to get higher dowries, that is true for brides too, regardless of religion, which is at odds with the groomprice motive. Moreover, we find that literate grooms are less likely to participate in the dowry system, whether Muslims or Hindus.[54] This shows how different the participation and dowry amount decisions can be for Muslims: literate Muslim grooms participate less, however, if they participate, then they receive higher dowries.[55]

Other interesting results are as follows. Female literacy for Hindu women increases the probability of being given a dowry (this is consistent with the inheritance hypothesis, as a proxy for assets of the bride's family).[56] In contrast, Muslim literate women seem to be less likely to be given a dowry: this might be interpreted as consistent with the fact that basic education may be an asset in the marriage market (that would be the case if literate women are more likely to remain married). However, the fact that female literacy is not an important determinant of a woman's probabil-

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[54] Rao (1993) uses the eligible sex ratio as a proxy for the marriage squeeze argument: under that hypothesis, more eligible females per eligible man would imply higher dowry payments. However, in the presence of potential polygyny, it is not clear that the eligible sex ratio constitutes a proper test of the marriage squeeze hypothesis. For this reason and due to data availability we have not included it in this regression. However, if we include it we get an unsignificant coefficient.

[55] In the regressions in Tables 1.5 and 1.6 we have distinguished between spouse from same *bari* (extended family) and spouse from the same village (but not the same *bari*) in order to try and distinguish different dowry motives. If we instead use only spouse from the same village (incuding the same bari), we get the same results as without the same bari: negative significant results for Muslims, no effect for Hindus.

[56] Under a female inheritance hypothesis, we would expect wealthier brides to be given larger dowries, and possibly to be more likely to be given a dowry. Unfortunately our data set does not contain information about assets of the bride's family. Bride's wealth being omitted, we would generally expect, as Edlund (2000, 2001) notes, that bride literacy proxies for her family's wealth, and hence we should find a positive relationship between the bride's literacy and participation.

ity to remain married (Table 1.4) does not make this point clearer. Finally, younger brides are more likely to get a dowry and to get a larger dowry.

In much of the literature about dowry, increasing participation has been understood as *sanskritisation*, that is, lower classes or castes imitating the upper ones.[57] Interestingly, in the case of Muslims of Bangladesh, it is also likely that compulsory marriage registration law made the community more aware of the benefits of registration in case a dowry was given, providing incentives for both marriage registration and dowry participation to minimise the probability of divorce and provide the bride with funds in the event of divorce.[58]

1.4.3 Dowry vs. inheritance

In this last empirical part we try to know a bit more about the relationship between dowry and inheritance. In the last section we have found some slight evidence on the pre-mortem bequest hypothesis. Is it possible that dowry is a pre-mortem bequest to Hindu daughters? And, even though dowry incidence for Muslims seems to have increased due to the fact that it is minimising the probability of divorce, is it possible that this is somewhat connected with inheritance?

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[57] Srinivas (1957) created the concept of *sanskritization* to denote the process by which patriarchal norms and lifestyle of higher castes in India have been gradually spreading to other castes, patriarchal norms including wives not participating in the labour market.

[58] The model might in fact be estimated with either of two estimators: Heckman maximum likelihood estimator (Heckman 1979), or Heckman two-step estimator (Heckman 1976). We have chosen to provide estimates under the former because it is superior—even though the latter is consistent, it is inefficient. In contrast, maximum likelihood is efficient under the assumption of joint normality of ε_{Ai} and ε_{Pi} (Wooldridge 2001). A practical advantage of using maximum likelihood is that we can cluster standard errors with a simple STATA command. We have nevertheless estimated the model with the two-step estimator, and our results do not basically change.

We now take advantage of the information in the data set regarding assets received via inheritance. We cannot undertake a formal regression analysis because although we have information regarding whether an individual has inherited any assets, we do not know when the individual's parents passed away. We do know, though, whether the bride's father was alive at the time of her marriage. Therefore if we restrict the sample to that of women whose father was dead at the time of their marriage, we know whether a dowry and/or inheritance have been given.

For the sample of 1,200 women whose father had already passed away when they got married, we look at the correlation between a dummy variable for dowry participation and a dummy variable equal to one in the case that the woman inherited. Table 1.7 shows these correlations, by religious affiliation and period.

Looking at both religious groups together, we can see that women who got married from 1975 onwards have been less likely to get a dowry if they had already received inheritance. Although the correlation index is low (-0.06), this is significant at the 5% level. However, no significant correlation exists before 1975: the fact that a woman received inheritance does not seem to have any relationship with whether she got a dowry or not. Table 1.7 also shows that this negative relationship between dowry and inheritance only exists for Muslims. For Hindus, whether marriage was held before or after 1975, the correlation is not significant.

These correlations constitute just a very simple descriptive statistical analysis. It is nevertheless suggestive of the idea that there exists some degree of substitutabil-

ity between dowry and inheritance to daughters for Muslims since 1975. Before 1975, a few Muslim families may have been giving both inheritance and dowry to daughters, while others gave just one of the two, or neither. However, after 1975, brides who have already received a share of inheritance at their fathers' death were not given a dowry at the time of marriage.

Which of the dowry hypotheses in this study are these correlations consistent with? Under the groomprice hypothesis, there could exist a positive relationship: *ceteris paribus* we might expect wealthier parents to give dowry as well as inheritance to their daughters at the time of their death. However, under that hypothesis it could also be the case that women who have received inheritance are better endowed later in the marriage market so that their equilibrium dowry may be zero. Under the inheritance hypothesis, if the woman's father has died before her marriage, and she got an inheritance, the incentive problem in Botticini and Siow (2003) disappears, therefore a dowry would not be needed. Finally, under the insurance hypothesis, if a woman's got inheritance, and therefore has assets of her own, it makes also sense that an insurance is less needed for her protection against divorce – as both her husband's incentive to divorce and her post-divorce economic disgrace would be lower. Hence the three hypotheses seem to be consistent with a negative relationship – however, there is no reason for which the former two would only hold for Muslims, which again lends some support to the insurance hypothesis.

1.5 Discussion

The empirical evidence in the previous section is consistent with dowry functioning as insurance for Muslim families in rural Bangladesh. The timing of the dramatic increase in dowry participation coincided with the Muslim Marriage Registration Act 1974, that made marriage registration compulsory for Muslims (there is no such analogous legislation for Hindus). One possibility that is mentioned in this study is that greater awareness of marriage registration benefits may have facilitated dowry refund. However, the link between these two is not clear: dowry, as opposed to dower, is not stipulated in the marriage contract, but rather contracted orally between the parts. How then, is the dowry refund upon divorce enforced? Due to the illegal status of dowry, the refund is likely to be informal. In fact, there is a stark contrast between dowry and dower enforcement, in that dower does enjoy a legal status and it is therefore possible to follow a legal process to claim dower. However, it is reported that the legal process is so cumbersome, long and expensive, that getting the dower is not feasible. This would explain why many husbands do not pay dower to their divorced wives (Hossain 2003, Menski 2000, Kamal): if wives are not going to engage in costly and long claims for dower, divorced husbands have little economic incentive to provide the dower. Hence, rather paradoxically, it may be that a dowry's informal contracting, which is not subject to a long and costly claim process, but more likely to operate through a rather informal way, may be more successful in providing wives with funds in the event of divorce. In fact, we do know from interviewees responses

that dowry may be refunded: when respondents are asked about why they think that a majority of the people register their daughters' marriages now (as opposed to as in the past), their most cited responses are: legal benefits in general, impossibility for the husband to take a second wife, dowry refund, and being less beaten up by the husband.

Dowry makes sense as insurance instrument if remarriage of husbands is *punished* with a lower dowry. Otherwise, a husband who got a dowry of say 1000 Taka could divorce his wife by repaying the 1000 Taka from a 1000 Taka dowry from a later marriage, and therefore dowry would not serve as deterrement to divorce. It is difficult to test this argument rigorously with this data set because although there are records of men with multiple marriages, not all dowries are reported. But in five out of the six cases we have identified in the data, the dowry from the later marriage is lower.[59] In a groomprice context, this would also be consistent with later marriages involving higher quality brides, or simply lower quality of these men due to having previously been married.

The previous discussion opens the question of why dowry is being used as insurance against divorce while this was not the case before the 1970s. Indeed, there must have been some element that has made either divorce more possible, or rather the consequences of divorce upon women more terrible, that has prompted this need for more insurance against divorce. There is no evidence for the former, as divorce

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[59] For instance, a man reports a dowry of 6,000 Taka for a marriage in 1983, and a dowry of 3,000 Taka for a marriage in 1985. Another one got married twice in 1991. In the first marriage he got 13,000 Taka, while in the second one he got 3,000 Taka.

rates are low. Regarding the latter, though, it is worth noting that authors argue that there has been a substitution between dower and dowry since the early 1970s (Rozario 1992). Therefore, dowry might have started being used now as insurance to fulfill the role that was once played by dower. Indeed, it is argued that even though dower may still be stipulated in the marriage contract, the stipulated dower is very little, making it impossible to contribute sufficient funds to solve an abandoned wife's economic distress. Why has there been a shift from dower to dowry? As argued before, it is possible that dowry enforcement is cheaper than dower enforcement. In that sense, dowry might constitute a cheaper insurance instrument than dower, and its adoption as insurance instrument in rural Bangladesh may have simply followed an imitation process. Finally, it could be theoretically possible to enforce tougher post-divorce maintenance laws so as to provide wives with insurance against divorce, but maintenance seems to share the institutional characteristics of dower (long, expensive legal process subject to Islamic law), so in effect maintenance is often not provided by husbands (Menski 2000) (see the Background Appendix for more information on Islamic family law and its application in Bangladesh).

Finally, it is also not very clear how legislation to strenghten women's rights in marriage/divorce may affect an informal, not legal, insurance instrument. One possibility is that a proof of marriage readily provides a wife with rights that would otherwise not have. Low literacy in the area may contribute to ignorance about which sort of rights these are—indeed, many women in the area are not aware of their rights,

regarding e.g. dower, and many respondents are unable to report some basic data such as the year they got married.[60] This would also explain why women respondents also connect marriage registration with less beating from the husband, even though there is no legislation against beatings relying upon a proof of marriage: it could be seen as a sort of *framing* effect, that a better general legal position of women in marriage has made enforcement of an informal instrument a feasible cheaper option that dower enforcement.

1.6 Conclusion

This study examines dowry payments in the Matlab region of rural Bangladesh by using data about couples that married over the 1931-1996 period. We present evidence that the so-called rise in dowries in Bangladesh is only an incidence rise, that this is mainly a Muslim phenomenon, and that this can be explained by understanding dowry as an insurance against divorce. We argue that the dramatic increase in dowry participation in the region is explained by greater awareness about the fact that by giving the groom a dowry, the bride's parents insure themselves and their daughter against her divorce or abandonment (which would imply her return to the parental home, which is considered a social disgrace) as a husband who wants to exercise unilateral divorce has to refund the dowry. This hypothesis for dowry, which constitutes a novelty in the economics literature of dowry, is tested in a variety of ways.

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[60] More generally respondents to other surveys in rural Bangladesh have been unable to report their year of birth (McCarthy et al 1978).

The identification strategy makes use of religious affiliation of the couple and geographical origin of the spouse. First, we find that the higher the dowry that a couple gets, the greater the probability that an individual remains married. This is statistically significant for Muslims, but it is not significant for Hindus—this is related to the Muslim personal law, under which divorce for Muslims is contractual. We argue that the dramatic increase in dowry participation by Muslims coincides with the enactment of the Muslim Marriage (Registration) Act in 1974, which made registration of marriages compulsory, and may have created awareness of the benefits of giving a dowry in the case of Muslims.

Second, we find that, consistent with the insurance hypothesis, couples where the groom is from outside the village (1) are more likely to get a dowry and (2) get a higher dowry. Again, and consistent with the hypothesis in this study, this is only true for Muslims. In the last piece of evidence for the insurance hypothesis, we do find that female divorce rates have dropped since 1981 (Figure 1.5).

We also find some evidence for the bequest motive. We find that wealthier Hindu parents provide their daughters with higher dowries. We also find that from 1975 onwards, both Muslim and Hindu parents seem to be substituting between inheritance to daughters and dowries. We do not find evidence consistent with the marriage squeeze hypothesis: the eligible sex ratio is not significantly related to either the probability of getting a dowry or the dowry amount.

All in all we claim that dowry in rural Bangladesh is not a groomprice and that dowry prohibition may not be a useful policy for rural Bangladeshi women. Regarding the Muslim community, dowry does seem to be useful in protecting females against unilateral divorce, which would imply their abandonment and disgrace. The root of the problem is then the social disgrace that accompanies divorce in rural Bangladesh. While dowry is usually thought of as a bad custom, it seems that the root of the problem for women is the highly unequal gender relations in rural Bangladesh. In this same line, enforcing compulsory substantial (dower) payments to wives to be made by husbands who want to divorce would provide the same deterrent effects that dowry is currently providing. However, since that may be a difficult policy to enforce (as is currently happening with dowry prohibition), what seems the most urgent policy is to further spread awareness of the benefits of marriage registration among the Muslim community, and provide dowry with a legal framework that can prevent violence and extortion through further payments.

1.7 Data appendix

Most of the data comes from the Matlab Health and Socio Economic Survey (MHSS) household survey that is explained in section four. The survey gathers data from households in Matlab, a region northeast of Dhaka, Bangladesh.

While information about nominal dowry is provided in the data set, a deflator is needed to trace the evolution of real dowry over time. As a consumers price series

for Bangladesh is not available for the period of study, we follow Khan and Hossain

(1989) and Amina and Cain (1995) and use rice as a deflator. Since rice is both the

main product and the main article of consumption, it is fairly representative of aver-

age prices. Getting any time series for Bangladesh is a real challenge: Bangladesh

was part of the British Indian provinces of Bengal and Assam during 1757-1947,

then it became part of Pakistan in 1947 (and was known as East Pakistan) until 1971,

when it became independent.

We use a measure of **retail prices of medium rice** in Bangladesh. Ideally it

would be best to use a regional measure (from the Comilla region)[61] , but this is

not available, the most disaggregated level that is available is the *division* level, but

this is only available in a consistent way for 1978 onwards. Our rice price series

draws from several publications. For 1931 to 1946, information was taken from the

Statistical Abstract for British India [HMSO, London] about the whole British India.

For 1947 to 1949, it comes from the *Statistical Abstract: India* [Central Statistical

Organisation, India]. For 1949 to 1968, information for Bangladesh is taken from the

Pakistan Statistical Yearbook [Federal Bureau of Statistics, Karachi]. For 1968 on,

we have used the data in the *Bangladesh Statistical Yearbook* [Bureau of Statistics,

Bangladesh]. Since the Indian data is not only for Bangladesh but for the whole

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[61]   Called *Tripura* or *T-para* before the mid 1950s. Jaffor Ullah (2000) explains the reason for the name change: "The name of present-day Comilla district in Bangladesh was Tripura or T-para before mid 1950s. Comilla was the name of one of the major towns in Tripura. However, when East Pakistan was formed in 1947 a part of Tripura was given to East Pakistan. The Pakistani officials could not handle the name Tripura. It sounded almost like a Sanskrit name, which it was. Nevertheless, in the early fifties the district was called Tripura. Later, they named the entire administrative district as Comilla. They must have heaved a great sigh of relief to get rid off that Sanskrit name as quickly as possible."

British India section, we believe that the series is consistent for the 1949-97 period. There are only 80 observations of dowry before 1950, the bulk of the data lying on 1970-96, where only the data from the same publication has been used.

Information about **population**, in particular about the number of females and males in the 'area' and their marital status comes from the respective censuses (*Census of India* 1931 and 1941 [India], *Census of Pakistan – East Pakistan* 1951 and 1961 [Census Comissioner, Pakistan], *Population Census of Bangladesh 1974*, and *Bangladesh Population Census* 1981 and 1991 [Bureau of Statistics, Bangladesh]).

To calculate the sex ratio we use the number of females to males in the Tippera/Comilla district for 1941 to 1981, and in the Chandpur Zila for 1991 (Matlab belonged to Comilla until the geographical reorganisation of 1984). In particular we use the *eligible* sex ratio, that is we take into account that marriageable age is different by gender: following Rao (1993a) and related literature we take the ratio of girls aged between 10 and 19 years to the number of boys aged between 20 and 29 years.

To calculate female and male **divorce rates** in the area we take the percentage of the population of age 10 years and above who are divorced.

1.8 Background appendix: Marriage, divorce and marital transfers in rural Bangladesh

1.8.1 Introduction

In rural Bangladesh, marriage is the only true vocation for women. The Child Marriage Restraint Act 1929 has been amended by Ordinance in 1984 so that the minimum ages are 21 for men and 18 for women, but even recently it is not rare for women to get married being younger than ten years old. In Bangladesh, parents ordinarily select spouses for their children, although men frequently exercise some influence over the choice of their spouses. After marriage, brides usually leave their parents' house for the groom's house, where they are under the authority of the husband and in-laws. Once they are married, the possibility of divorce is different for Muslims and Hindus,[62] as the concept of marriage itself is different. Marriage among Muslims is civil and contractual, whereas it is sacramental and eternal for Hindus.

The law on marriage in Bangladesh is governed by the personal laws applicable to each community – Buddhist, Christian, Hindu, Muslim, Parsi or Sikh – and relevant statutory modifications.[63]Bangladeshi Muslims are followers of the Hanafi Islamic law school which, although originated in Iraq, extended early to the Indian subcontinent. Of the four schools of classical Islamic law, the Hanafi school is allegedly the one that is more favourable to the male.

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[62] In Bangladesh there are also smaller Christian and Buddhists communities. Since in our sample there are only Muslims (90%) and Hindus (10%), henceforth we only refer to these two religious groups.

[63] Shaikh (1998).

1.8.2 Marriage

Islam considers marriage to be incumbent on every Muslim man and woman unless they are physically or financially unable to pursue conjugal life. Marriage though is not religious in the sense of a sacrament, but rather in the sense of realizing the essence of Islam. In Islamic law, marriage is a civil contract legalizing intercourse and procreation. The law does not require the contract to be made in writing, and the custom of oral contracts seems to have prevailed in the past.

However, marriage written registration is compulsory for Muslims under the Muslim Marriages and Divorces (Registration) Act, enacted in 1974 in order to strengthen the inducements for civil registration. This act states that "every marriage solemnised under the Muslim law shall be registered in accordance with the provisions of this Act" and establishes the licensing of Nikah Registrars. The punishment for not registering a marriage is a prison sentence (three months in jail) and/or a fine (500 Taka). Failure to register does not invalidate a marriage, but it fails to provide the bride with a proof of marriage. It should be noted that, although there is no legislation to this effect,[64] nowadays it is customary for a bride to introduce conditions that are favourable to her directly into the marriage contract (for instance, a woman may want to eliminate the husband's right to take a second wife, or may want to demand more freedom of mobility, or to allow for delegated divorce). Registration of marriages was rare before this law was passed, but a majority of families is currently

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[64] Inserting stipulations in the marriage contract is allowed for in the Hanbali school of law, but not in the Hanafi (Esposito 2002).

believed to register their daughters' marriages.[65] No similar registration law exists

for Hindus in Bangladesh.

1.8.3 Divorce

Consequently with the respective concepts of marriage, divorce is extremely rare for

Hindus,[66] while it is more feasible for Muslims. However, although certain types of

divorce are approved by Muslim law, divorce is still considered undesirable.[67] Is-

lamic personal law establishes five types of divorce (*talaq*). The first of them, and

by far the most common in rural areas (Kamal), is unilateral. *Talaq* can be revoca-

ble (*talaq al-sunnah*, which comprises the forms *talaq al-ahsan* and *talaq hasan*), in

which case it lies within the Prophet's teachings and is therefore approved, or the in-

novation, unapproved, irrevocable divorce (*talaq al-bidah*), which basically consists

of the husband verbally stating three times that he divorces his wife, and the triple

talaq becomes irrevocable. Under Islamic law, unilateral divorce is reserved to men

only.[68] The triple *talaq* has favour with men, especially in South Asia, and there has

been widespread abuse of this male discretion to divorce (Menski 2000, Kamal). The

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[65] MHSS questionnaire (Rahman et al 1999b).

[66] The Hindu community finds provision for divorce under the Hindu Married Women's Right to Separate Residence and Maintenance Act of 1946.

[67] Many Quranic verses make clear the undesirability of divorce and the punishments awaiting those who exceed the limits set by God. However, the law did not translate these teachings and values of the *Quran* into specific legal restrictions on the husband's right to divorce to guard against abuses (Esposito 2001).

[68] Rahman (1989) argues against the possibility of unilateral divorce by women as follows: "A woman's psychological and physiological make-up is such that every month for a period of five to seven days she is in a state of pathological change (...) If women were given the power of unilateral divorce, it is probable that millions of them would divorce their husbands and it is probable that millions of divorces would have ensued and there would be chaos in society."

instant effects of the triple talaq leave Muslim wives totally powerless and, in the harsh realities of South Asian life, husbands may not even honor their obligations in terms of paying maintenance and paying dower (explained below).

There have been some modern attempts at redressing this blatant abuse of patriarchal power in the name of religion. British colonial legislators chose not to get involved in legal regulation of talaq al-bidah. Instead, they focused on assisting Muslim wives in obtaining a divorce through court procedures: they did extend the grounds for the wife's requirement of divorce under the Dissolution of Muslim Marriages Act (1939), improving the legal position of Muslim wives (Menski 2000). For instance, while divorce on the grounds of husband desertion was still only available in the case that the husband had gone missing, the waiting period ceased to be ninety years since the husband's birth to four years without knowing the whereabouts of the husband (Esposito 2001). Pakistan enacted the Muslim Family Laws Ordinance (1961) as a state attempt to control the sphere of family law. The statute preserves the man's right for unilateral divorce, but in that case he "shall, as soon as may be after the pronouncement of talaq in any form whatsoever, give the Chairman notice in writing of his having done so, and shall supply a copy thereof to his wife" (Menski 2000). That is, with the reform, although the triple *talaq* was still valid, it needed written confirmation. Later, the written requirement has been considered anti-Islamic and in

practice Muslim law in both Pakistan and Bangladesh has taken the view that notice

of divorce is not essential.[69]

In the second type of divorce, delegated divorce (*talaq al-tafwid*), the wife

has some power to divorce, but this is controlled by the husband. The third type is

mutual divorce, either *khul*, where it is the wife who has the desire to separate; the

divorce consists of an agreement between the husband and the wife upon the sum

that the wife has to pay the husband for that effect, or *mubaraah*, where the desire

for separation is mutual. The fourth type of divorce is by judicial process, lian, when

the husband accuses the wife of adultery without legal proof, and, faskh, in which

case it is the wife who seeks the judicial authority to dissolve the marriage – which

she can only require on very narrow grounds in the Hanafi school.[70]Finally, classical

Hanafi law allowed for apostasy divorce: by renouncing Islam, the marital tie would

be dissolved *ipso facto* (in light of the evidence that some women were using this

option to divorce unilaterally, though, this type was ruled out by the Dissolution of

Muslim Marriages Act 1939).

Even though Muslim marriage is not sacramental, divorced Bangladeshi women

are usually stigmatised: after marital disruption, return to the parental home is not re-

spectable by the community, and may be especially difficult if parents are deceased

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[69]   Direct regulation of *talaq al-bidah* has not been attempted in India. Instead, India has tried to ex-
ercise some control on the Muslim husband's absolute discretion to divorce through enforcing tougher
post-divorce maintenance laws, that is, to at least seek to regulate the socio-economic consequences
of marital breakdown (Menski 2000).

[70]   Although they did not regulate irrevocable divorce, British colonial legislators did extend the
grounds for the wife's requirement of divorce under the Dissolution of Muslim Marriages Act (1939).

or in poverty. As a result, divorced women are socially disgraced and hence all brides are expected to try their best to make their marriage a success (Bhuiya and Chowdhury 1997). Furthermore, as mentioned by Ahmed and Naher (1987), since marriage in Bangladesh is regarded as the only true vocation for women in society, a single, working woman is not accorded equal status to that given to a married woman.[71]

1.8.4 Marital transfers

Dower

There are two traditional marital transfers in rural Bangladesh. The first of them, dower (*mahr*, or *mehr*), is Islamic in nature (and it is accordingly regulated by Islamic personal law) and constitutes a protection against utter destitution should she lose her husband through separation or death. The sum can be claimed by her either when she marries or in case of divorce. Dower already existed in pre-Islamic Arabia, where it was a payment to the bride's father. Islamic law made dower payable not to the bride's father, but only to the bride herself, so the marriage could not be considered a sale (Esposito 2001). In Hanafi school it is universal to divide the dower into portions, prompt dower (*muqqadam*), payable upon conclusion of the marriage contract, and deferred dower (*muakhkhar*) paid only on termination of the marriage. However, most husbands do not pay the dower to their divorced wives (Hossain 2003). In fact, not only this payment is not usually given, but also many

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[71] This is the case in other South Asian countries as well, e.g. India (especially Northwestern India, see Drèze and Sen 1995) and Pakistan.

women are unaware of this right.[72] In sum, dower is, as Amin and Cain (1995) point out, seldom of any real significance.

Reportedly, since the early 1970s, the dower system has been replaced by a dowry system (Rozario 1992).

Dowry

Dowry (*joutuk* or the English word *demand*), is a (customary) transfer from the bride's family to the groom and his family, and is not directly related to Islamic personal law. Even though brideprice (*pawn*) existed in Bangladesh during the first decades of the twentieth century, whereby the transfer was made from the groom's to the bride's side,[73] dowry payments have been reported since at least the 1940s.[74] In this study we do not focus on the change from brideprice to dowry, which involved only the Hindu minority,[75] but on the evolution of dowry from approximately the 1940s on, especially focusing on payments done by the Muslim community, who constitute roughly 90% of the Bangladeshi population. The Dowry Prohibition Act of 1980 prohibits dowry payments in Bangladesh. Not only is this law often unknown and very frequently not observed, especially in rural areas, but also its usefulness is questionable, as the time it stipulates for dowry cases is only one year. Moreover, the

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[72] The women who are aware of this right in our region of study also call dower *legal dowry*.

[73] The change from brideprice to dowry has been extensively studied for India (Caldwell et al. 1993).

[74] Actually the first observation in our sample of study in Matlab corresponds to a marriage that took place in 1931. It is not until the 1940s that we find more observations though. An interesting explanation may lie in Anderson's (2003) study about India.

[75] Jahan (1988).

settlement of litigation related to dowry, like other cases, takes a long time and poor

women cannot afford the cost of such long process.

	1931-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1996
Female age at marriage	12	13.9	14.7	15	17.6	15.4
Male age at marriage	21	24.5	25.1	24.7	25.2	25.1
Age gap at marriage	9	10.9	10.7	9.7	7.6	9.5
Spouse from same bari (%)	6.6	10.3	7.3	8.1	9.6	8.4
Spouse from same village (%)	17.6	19.2	23.3	21.4	22.5	22.1
Husbands with more than one wife (%)	2.2	3.2	2	1	1.5	1.5
Dowry value (in rice kg)	12458	18559	4747	2332	865	884
Couples with dowry (%) - Muslim	3	2.3	4	28	60	27
Couples with dowry (%) - Hindu	0	45	36	54	73	51

Notes: bari is a compound where an extended family lives in Bangladesh.

Dowry value is in rice kg (see data appendix at the end of Chapter 1).

Table 1.1: Evolution of main variables

Variable	Number of observations	Mean	Standard deviation	Min	Max
Dowry amount	972	1392	4840	0	125000
Dowry participation	6317	0.31	0.46	0	1
Husband can read	4396	0.44	0.50	0	1
Wife can read	6959	0.34	0.47	0	1
Bride's father richer than father-in-law	6249	0.39	0.49	0	1
Husband's assets	4059	144715	197094	0	1826000
Husband age at first marriage	3873	24.6	4.87	12	40
Wife age at first marriage	6256	15.4	4.68	6	28
Husband separated or divorced - Muslim	3725	0.09	0.28	0	1
Husband separated or divorced - Hindu	403	0.02	0.13	0	1
Wife separated or divorced - Muslim	4724	0.08	0.27	0	1
Wife separated or divorced - Hindu	504	0.01	0.09	0	1
Spouse from same bari	6205	0.13	0.34	0	1
Spouse from same village	6217	0.80	0.40	0	1
Spouse was parents' choice	13031	0.90	0.30	0	1
Husbands with more than one wife	4395	0.04	0.20	0	1
Land owned by husband	12826	21.8	71.5	0	1575

Notes: bari is a compound where an extended family lives in Bangladesh.

Dowry amount is in rice kg (see data appendix at the end of Chapter 1).

Table 1.2: Descriptive statistics of main variables

Dependent variable=1 if still married, =0 if divorced or separated		
Muslim		
	Male	Female
Dowry amount	0.00005***	0.00002**
	(2.74)	(2.11)
Parents chose spouse (=1 if yes, =0 if not)	0.02	0.02
	(0.74)	(1.14)
Year of marriage	0.003**	0.003***
	(1.99)	(3.33)
Number of observations	538	558
Hindu		
	Male	Female
Dowry amount	0.00001	-
	(1.48)	
Parents chose spouse (=1 if yes, =0 if not)	0.00001	-
	(0.73)	
Year of marriage	-0.00001	-
	(1.54)	
Number of observations	119	-

Notes: absolute t-statistics calculated using robust standard errors
clustered at the extended household level in parentheses.
*significant at 10%; **significant at 5%; ***significant at 1%.
Coefficients denote the increase in the probability for a one unit
increase in the independent variable. There are no separated female
Hindus in this small sample (there are cases of separation in the
broader female Hindu sample). Observations are for marriages.
Dowry amount is in rice kg.

Table 1.3: Probit estimation of the probability of remaining married

Dependent variable=1 if still married, =0 if divorced or separated		
	Male	Female
Dowry amount in real terms	0.00005***	0.00001*
	(2.82)	(1.88)
Wife can read (=1 if yes, =0 if not)	0.014	0.006
	(0.46)	(1.07)
Husband can read (=1 if yes, =0 if not)	0.03	0.007
	(1.05)	(1.33)
Husband's total assets	-0.001	-0.001
	(0.18)	(1.08)
Groom's age of marriage	-0.001	-0.001***
	(0.18)	(4.28)
Bride's age of marriage	-0.01**	0.002***
	(2.37)	(4.81)
Parents chose spouse (=1 if yes, =0 if not)	0.01	0.02**
	(0.38)	(2.06)
Spouse from same village (=1 if same HH, bari or village, =0 if not)	0.04	-0.0001
	(1.34)	(0.09)
Dummy post1975	0.13	-0.003
	(1.28)	(0.46)
Eligible sex ratio	-0.52	-0.10**
	(2.21)	(2.10)
Year of marriage	0.01***	0.002**
	(2.87)	(2.19)
Number of observations	336	355

Notes: absolute t-statistics calculated using robust standard errors clustered at the extended
household level in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%.
Coefficients denote the increase in the probability for a one unit increase in the independent
variable. Observations are for marriages. Dowry amount is in rice kg.

Table 1.4: Probit estimation of the probability of remaining married, only Muslims

Dependent variable: log of dowry in rice kg.			
	All	Muslim	Hindu
Wife can read (=1 if yes, =0 if not)	0.40***	0.37***	0.36*
	(5.23)	(4.62)	(1.78)
Husband can read (=1 if yes, =0 if not)	0.29***	0.34***	-0.03
	(3.37)	(3.93)	(0.17)
Bride's father was richer than father-in-law (=1 if yes, =0 if not)	0.14**	0.10	0.51**
	(1.94)	(1.33)	2.36
Bride's age of marriage	-0.03**	-0.03**	-0.004
	(1.99)	(2.22)	(0.14)
Groom's age of marriage	-0.01*	-0.01	-0.01
	(1.85)	(1.45)	(1.10)
Parents chose spouse (=1 if yes, =0 if not)	0.17*	0.20*	0.03
	(1.72)	(1.87)	(0.13)
Spouse from same bari (=1 if same HH or bari, =0 if not)	-0.06	-0.15	0.22
	(0.36)	(0.93)	(0.50)
Spouse from same village (=1 if same village, =0 if outside village)	-0.20	-0.23*	0.04
	(1.58)	(1.68)	(0.09)
Muslim (=1 if yes, =0 if not)	-0.65***		
	(6.13)		
Year of marriage	-0.04***	-0.02**	-0.06***
	(2.21)	(2.10)	(3.79)
Mills inverse ratio	0.11	0.23***	-0.18
	(0.85)	(2.19)	(0.53)
Wald test for dowry payments (p-value)		0.09	

Notes: absolute z-statistics calculated using robust standard errors clustered at the extended household level in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%.

The Wald tests for dowry payments and participation test the null hypothesis that the Muslim and Hindu coefficients for whether the spouse comes from the same village are equal.

Table 1.5: Heckman Maximum Likelihood estimation of dowry payments with dowry participation selection

Selection equation			
Wife can read (=1 if yes, =0 if not)	-0.13	-0.22**	0.43*
	(1.45)	(2.25)	(1.65)
Husband can read (=1 if yes, =0 if not)	-0.32***	-0.31***	-0.46*
	(3.62)	(3.31)	(1.55)
Bride's father was richer than father-in-law (=1 if yes, =0 if not)	0.47***	0.47***	0.36
	(5.61)	(5.37)	(1.35)
Bride's age of marriage	-0.05***	-0.05***	-0.05
	(3.99)	(3.78)	(1.48)
Groom's age of marriage	-0.01*	-0.01*	-0.01
	(1.91)	(1.77)	(0.52)
Parents chose spouse (=1 if yes, =0 if not)	0.16	0.17	0.15
	(1.57)	(1.48)	(0.50)
Spouse from same bari (=1 if same HH or bari, =0 if not)	-0.05	-0.10	0.22
	(0.30)	(0.59)	(0.61)
Spouse from same village (=1 if same village, =0 if outside village)	-0.34***	-0.32***	-0.56
	(2.57)	(2.32)	(1.48)
Muslim (=1 if yes, =0 if not)	-1.61***		
	(7.30)		
Dummy post1975 (=1 if marriage after 1975, =0 if not)	-0.57**	0.55***	-0.66
	(1.96)	(3.14)	(1.54)
Muslim*Dummy post1975	1.10***		
	(4.13)		
Year of marriage	0.07***	0.07***	0.07***
	(8.46)	(7.73)	(3.98)
(1) Wald test for dowry payments and participation independent (p-value)	0.40	0.002	0.60
(2) Wald test for dowry participation (p-value)	0.17		
Number of observations	1582	1397	185

Notes: absolute z-statistics calculated using robust standard errors clustered at the extended household level in parentheses.

Null hypothesis for test 2 is that the Muslim and Hindu coefficients for spouse from same village are equal.

Table 1.6: Heckman Maximum Likelihood estimation of dowry payments with dowry participation selection (continued)

All	1931-1974	1975-1996
Correlation between inheritance and dowry	0.03	-0.06
p-value	0.76	0.03
Number of observations	121	1074
Muslims	1931-1974	1975-1996
Correlation between inheritance and dowry	0.08	-0.07
p-value	0.38	0.02
Number of observations	114	969
Hindus	1931-1974	1975-1996
Correlation between inheritance and dowry	-0.18	0.02
p-value	0.48	0.85
Number of observations	17	105

Note: the sample is the number of women whose father was dead
at the time of marriage.

Table 1.7: Correlation between inheritance and dowry

Chapter 2
Gender Discrimination and Growth:
Theory and Evidence from India

Woman's participation in employment outside the home is viewed as inappropriate, subtly wrong, and definitely dangerous to their chastity and womanly virtue. When a family recovers from an economic crisis or attempts to improve its status, women may be kept at home as a demonstration of the family's morality and as a symbol of its financial security. (...) Well-off and better-educated families may send their daughters to school, but are able to afford the cultural practice of keeping women at home after schooling is complete (Women and the Economy in India)

In terms of skill development, women are impeded by their lack of mobility, low literacy levels and prejudiced attitudes toward women. When women negotiate with banks and government officials, they are often ostracized by other men and women in their community (...). Government and bank officials have preconceived ideas of what women are capable of, and stereotypes of what is considered women's work (Chronic Hunger and the Status of Women in India)

There is a popular notion among many employers who feel that the men have a greater responsibility in supporting the family than the women and therefore have a greater right to the job (Report of the Survey of Women Workers' Working Conditions in Industry)

2.1 Introduction

Gender discrimination against women in the market place reduces the available talent in an economy, which has negative economic consequences. Gender discrimination takes many forms. Many social practices seen as normal from a religious or cultural point of view (which may have deep historical roots) leave women out of the economic mainstream. These social practices may have profound economic consequences because they do not allow society to take advantage of the talent inherent in women. This study investigates these economic consequences. Although gender discrimination may have a myriad of other important consequences, including psychological, sociological, and religious, these are not discussed in this study.

We develop a theoretical model that allows us to explore the economic implications of gender discrimination in the labour market. In the model, individuals are born with a given endowment of entrepreneurial talent and decide how much human capital to acquire, and whether to become managers or workers. Individuals can also engage in home production. Their choices depend on what everyone else is doing, because other people's decisions affect the returns to investment in human capital and the relative returns to becoming a manager or a worker. We study three possible scenarios. First, we analyse the labour market equilibrium without discrimination. Second, we model gender discrimination as an exogenous exclusion of females from managerial positions. Our model shows how this discriminatory practice affects the labour market, the equilibrium wage rate, the allocation of talent across working and

managerial positions, the investment in education by individuals (males and females), and economic growth. We show that discrimination tends to lower equilibrium wages for female and male workers, and to reduce investment in human capital by all females and by male workers. We also show that the average talent of managers is smaller in case of discrimination, which accounts for reduced innovation in the economy, and that the average productivity of workers, which accounts for technology adoption in the economy, is reduced too. Both factors lower economic growth. The fact that the relative average earnings of females relative to males are lower due to occupational segregation matches empirical evidence about the gender wage gap.[76]

Third, we model gender discrimination as a complete exclusion of females from the labour market. That is, women can only engage in home production. In this case, the equilibrium wage rate—and, hence, the average talent and productivity—is the same as in the case of no discrimination. Nevertheless, this type of discrimination is inefficient, because per capita GDP is lower than without discrimination, as home production productivity is lower than that of production outside the home. Economic growth is also lower because, even if the innovation and adoption dimensions are not affected, females optimally decide not to invest in human capital. Finally, we discuss why discrimination in the labour market of either type can be sustainable. In particular, the reason that gender discrimination in either managerial positions only or the overall labour market persists may be the existence of substantial transaction

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[76] Treiman and Hartman (1981) for instance using U.S. Census data estimated that as much as 35% of the pay gap was explained by occupational segregation. For more on occupational gender segregation, see Preston (1999), Reskin and Roos (1990), and Strober (1984).

costs in marital bargaining, as is argued in the context of noncooperative (separate spheres) bargaining in the marriage market.

While gender discrimination against women in the labour market in developed countries is usually identified with differential wage rates, it is in developing countries that this discrimination appears to take the form of differential access to wage employment (Collier 1994). To test the implications of the model we take the particular case of India. This is a relevant case for the current study since cultural reasons are there (as in many other countries) known to restrict women's access to work (Kumar *et al* 1999). The existence of a great variability in gender sensitivity and customs among Indian states makes it suitable for the sort of econometric analysis that we pursue. Regions in northern India (which tends to be more patriarchal and feudal) have lower female labour force participation rates than southern regions (where generally women have relatively more freedom and a more prominent presence in society). Although the cultural restrictions women face are changing, women are still not as free as men to participate in the formal economy (Drèze and Sen 1995, Dunlop and Velkoff 1999, Nihila 1999).

In order to make use of the variability over time among states, we then use panel data from sixteen Indian states over 1961-1991. We find that, as predicted by the model, the ratio of female-to-male managers and the ratio of female-to-male total workers are positively and statistically significantly related to output per capita. Specifically, an increase of 10 percent in the female-to-male ratio of managers would

increase per capita non-agricultural output by 2 percent, while an increase of 10 percent in the female-to-male ratio of (non-agricultural) workers of all classes would increase per capita non-agricultural output by 12 percent. Our regressions control for female and male literacy rates, socioeconomic controls, political controls, and state and year fixed effects. Robustness is checked controlling for potential endogeneity of the gender composition of the labour force by using the ratio of prosecutions launched to the number of complaints received under the Maternity Benefits Act (1961) as instrumental variable.

This chapter is organized as follows. In the next section we discuss some background information. Section 3 presents some related literature. Section 4 contains the model. Section 5 turns to the empirical evidence, and Section 6 concludes and discusses some policy implications.

2.2 Background information: women and the labour market in India

Female labour participation in India figures are still low: 22 percent according to the Census of India of 1991, and 28 percent according to the National Sample Survey (Kundu 1999). The definition of economic activity used by both the Census and the National Sample Survey is somewhat restrictive, even though it takes into account involvement in some household enterprises such as farm activities or small-scale artisan production or transacted service provision.

The evolution of female labour force participation rates in modern India has differed by state. Furthermore, female labour participation in India was lower in 1991 than in 1901-1951, when the participation rate ranged between 28 and 34 percent. While women in the middle classes do not tend to participate in the labour force, women from poorer households cannot afford to not engage in productive activity outside the home (Mammen and Paxson 2000). However, women in the upper classes are increasingly free to participate in the labour force, especially in the cities.[77] This suggests the existence of a U-shaped relationship between female labour participation and development as documented in Goldin (1995) and Mammen and Paxson (2000). Goldin (1995) argues that the initial decline in female participation is because of an income effect—due to the change from home production to manual work market production, against which a social stigma (what in this study we identify as social norm) exists—while, as economies develop, women enter the labour force through white-collar work, against which no social stigma exists.[78] Therefore female labour force participation in India is most likely the result of the interaction between social norms (enforced by social stigma that obliges men to provide for their families) and economic conditions: as Goldin (1995) shows with a simple model, the probability that the stigma will be binding will be greater the larger the family income. In this

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[77] In India, not until women receive specialised post-secondary education do they see significant improvements in their employment rates (Dunlop and Velkoff 1999).

[78] "The social stigma against wives working in paid manual labor outside the home is apparently widespread and strong (...). The prohibition is so ubiquitous that it seems likely to be connected with many of the most basic norms in society—those which bind the family together as a productive unit." (Goldin 1995).

study we identify the aggregate consequences of this so-called social stigma (or the social norm that it enforces), in not allowing women to participate in the labour market at certain stages of the development process.

Figure 2.1 displays the female labour participation rate as a function of logged per capita output, by Indian state (see Figure A1 for a map of India's states, and Table 2.1 for a list of the states used in this chapter).[79] Northwestern states (Bihar, Haryana, Jammu & Kashmir, Punjab, and Uttar Pradesh, with the possible exception of Rajasthan, which shows a slightly increasing pattern) plus Assam, in the North as well, not only have lower female labour participation rates for a given level of development but also are the only states which do not display the increasing part of the U-shape relationship. That is, in these states, development is not easing female access to the labour market—these states are characterized by highly unequal gender relations (large literacy gap by gender, strictly restricted female property rights, strong boy preference, and neglect of female children). In contrast, in South India, where gender relations are less patriarchal and for instance female education has extended relatively rapidly (Drèze and Sen 1995), states are in the increasing part of the U-shape relationship. This chapter addresses the consequences of social norms

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[79] The female labour force participation rate used here contains female employers, employees, single workers, and family workers (see the data appendix for more details and definitions). This figure excludes agricultural labourers and household workers, which belong to the informal labour market. Examined by group, the proportions of females as both employees and employers have been increasing with respect to development (only slightly for Northwestern states), while the proportion of women as single workers has decreased. The proportion of women as family workers has changed little for most states.

or stigma that do not allow women to have access to the same labour market oppor-

tunities as men which, in India, seem to be stronger in Northwestern states.
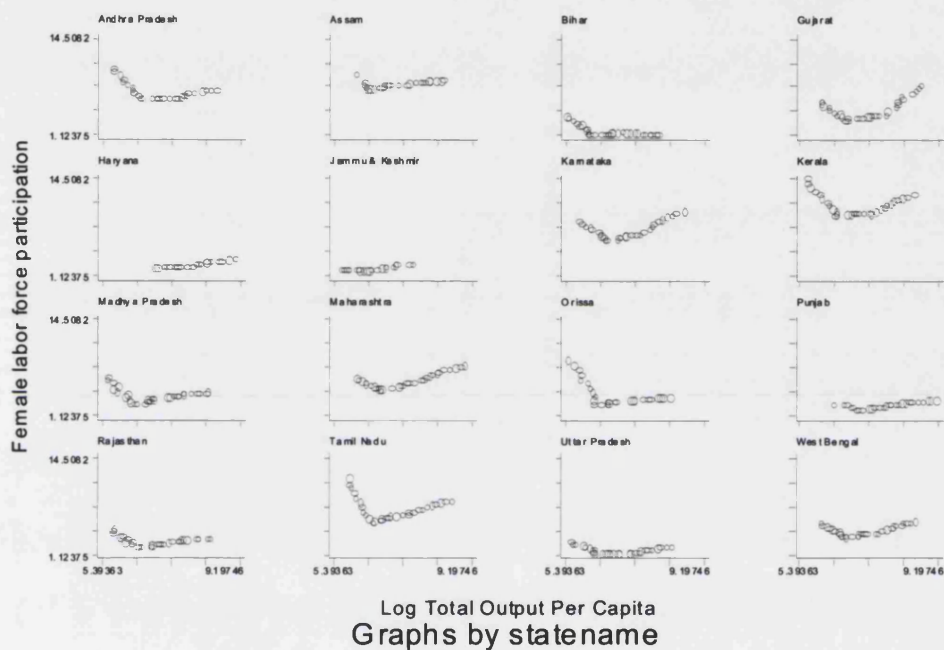
Figure 2.1 Female labour force participation as a function of development

The Government of India has tried to improve the status of women workers

through legislation directly targeting women (Maternity Benefits Act (1961), Equal

Remuneration Act (1976)), or indirectly (Plantations Labour Act (1951), Contract

Labour (1970), Inter-State Migrant Workers Act (1979), Factories Act (1948), and

Mines Act (1952)).

Despite the Government's attempts at improving women's working conditions,

inequalities remain. Men are more likely to get promotions than women—besides,

for men the nature of their jobs often changed with these promotions, unlike women, who usually only got increased responsibility and higher workload. Promotion policies are better in the public sector and unionised companies (Kumar *et al* 1999). However, the provision for facilities at the workplace is inadequate, regardless of whether the company is unionised.

2.3 Related literature

Even though an extensive literature tries and assesses the equity implications of gender inequality (e.g. the existence of unexplained inequality in wages,[80] potential gender gaps in the intra-household allocation of goods through demand analysis[81]) not much has been said about the efficiency costs of this inequality. It is sometimes said that discrimination hinders economic development, but how does this happen? Some studies explore the empirical relationship between different forms of gender inequality and growth. Most of them consist of cross-country analyses that measure gender inequality in terms of schooling, life expectancy,[82] or the gender wage gap, so that the usual problems arise (e.g. unobserved heterogeneity across countries). Therefore the

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[80] Instances are Blau (1996), Blau and Kahn (1994, 1999), Horrace and Oaxaca (2001), and Tam (1996). For the case of India, see Madheswaran and Lakshmanasamy (1996), who also consider how much of the gender gap among female and male science graduates is due to occupational segregation, and Duraisamy and Duraisamy (1996, 1999a, 1999b).

[81] Deaton (1989, 1997), Burgess and Zhang (2001).

[82] See Dollar and Gatti (1999), Klasen (1999), Esteve-Volart (2000), Knowles et al. (2002), Seguino (2000), or World Bank (2001a) for a survey. Tzannatos (1992) uses simulation and occupational data from a few Latin American countries to assess what would be the change in the gender composition of the labor force and in output were there wage equality across genders.

use of panel data from Indian states constitutes an alternative empirical analysis that might manage to overcome these shortcomings—in fact, to our knowledge this is the first study that quantifies the aggregate effects of gender discrimination that does not consist of a cross-country analysis.

The type of discrimination used in this chapter is related to the concept of discrimination on grounds of employers' tastes, which was first used by Becker (1971), and may be rational in the context of religious or traditional beliefs that might operate as social norms in many countries.[83] The concept of social norm that we use as to explain what we call total discrimination is related to the concept of social stigma in Goldin (1995) as explained in the introduction to this thesis, and it is consistent with Akerlof and Kranton (2000) . We consider discrimination as exogenous while there may certainly be a bunch of factors that can account for discrimination up to some degree. However, we do explore the sustainability of the operating social norm. We argue that inefficiencies arise due to distortions in the allocation of talent. The idea that distortions in the allocation of talent across occupations or sectors have negative growth implications is not new (Murphy *et al* 1991, Fershtman *et al* 1996), but to our knowledge this is the first study to use it in order to analyse the consequences of discrimination.

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[83] Nirmala and Parthasarthy (1999) find that marginalisation of women workers in India has been more in low growth states like Bihar and Orissa than in technology-intensive areas such as Punjab. According to the authors, cultural factors, more than technology, lead to women's marginalisation in the Indian labour market.

We adopt a broad concept of discrimination in understanding that inequality or differences in the access to resources (here, the labour market) by gender are in part due to underlying discrimination against women. Several studies report that in many countries it is more difficult for females to have access to human capital, land, and financial or other assets that allow them to be entrepreneurs (Blackden and Bhanu 1999, International Labour Organization 1995). Even in the 30 most developed countries in the world, the average incidence of females among managers is less than 30 percent. For Africa and Asia (including Pacific countries), according to the International Labour Organization (1995), the rates are lower than 15 percent (data refer to 1985-95), while female labour activity rates figures for 1999 are as low as 9.3 percent for Oman, 10.8 percent for Iraq, 14.5 percent for Jordan, 23.1 percent for Egypt, and 29.4 percent for India (World Bank 2001b).

There also exists an extensive literature that investigates a reverse relationship, i.e. how gender inequality changes along the development process. Some studies find the linear negative relationship that would be predicted by the neoclassical model, a second array of papers seem to find the U-shaped relationship described by Boserup (1970), in the same way as Kuznets (1955) established for income inequality, while finally another set of papers finds either no robust relationship or mixed results.[84]

This paper can also be related to some studies that explore other types of discrimination or discrimination in a broad sense. Coate and Tennyson (1992) explore

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[84] See Forsythe *et al* (2000) for a complete literature review and description of the different approaches.

what happens when individuals belonging to a group that is discriminated against face higher interest rates in borrowing to enter self-employment. This statistical discrimination is not derived from credit market discrimination, but from labour market discrimination, which spills over to the credit market in the context of asymmetric information regarding borrowers. A related hypothesis could be used to explain the form of partial discrimination that we use in this paper, as we explain later.

Our model is based on a model by Rosen (1982), who analysed the individual's decision between becoming a manager or a worker in order to match the empirical observation that managers' earnings at the highest hierarchies in large organizations are skewed to the right. As in that paper, we assume that (1) there are multiplicative productivity interactions and (2) the quality of supervision gets congested. Models where the decision between being a manager or a worker is given by latent talent (or alternatively, risk aversion) can also be found in Lucas (1978), Kanbur (1979), and Kihlstrom and Laffont (1979).

2.4 Model

2.4.1 The division between managers and workers in the labour market

Following Rosen (1982), we consider an economy where each firm is run by one manager, who employs workers. Workers, in turn, follow the directions that are given

by the manager. In our model, however, individuals can also not participate in the labour market as either workers or managers but rather work in home production.[85]

Individuals are born with a given endowment of underlying managerial talent, denoted by T.[86] Each individual can optimally choose whether she wants to become a manager or a worker. Each person is described by a vector of skills (r, q, q_H), where r denotes managerial skills, q denotes productivity as a (market) worker, and q_H denotes productivity as a home worker. The type of skill she actually utilises is determined by her decision to be either a manager, a worker, or a home worker, while the other skills remains latent. In our model, we also introduce the possibility of investing in human capital to increase the amount of skills. Also differently from Rosen (1982), talent is only useful for managers.[87] In particular, individuals can acquire higher education and/or primary education. We assume that those who want to become workers acquire only primary education, while those who want to be managers can acquire both primary and higher education. An individual cannot acquire higher education without first having completed primary schooling. No education is assumed to be necessary for the home production sector. Productivity of home workers is then constant and equal to one. That is, individuals can decide whether to become managers, workers, or home production workers. If they are workers, they can study and improve their productivity over one by acquiring primary education;

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[85] Home production here refers to productive activity that could be done outside the home (at firms).

[86] This concept is similar to the notion of *energy* used in Becker (1985).

[87] In contrast, Rosen (1982) uses a broader concept of talent, ξ, and assumes that skills are given and equal to $q = a_q + b_q \xi$ and $r = a_r + b_r \xi$, for some constants $a_k, b_k, k = \{q, r\}$.

however, if they are engaged in the home production sector then their productivity is equal to one. We assume that skills are given by the following:

$$r = cT\overline{H}_p + (1-c)T^\beta H_h^{1-\beta}$$

$$q = 1 + H_p^\sigma$$

$$q_H = 1 \tag{2.1}$$

with $0 < \beta < 1$ and $0 < \sigma < 1$, for some constant $0 < c < 1$. If a (market) worker does not invest in human capital, he has a skill equal to 1. H_j,for $j = \{p, h\}$ denotes the level of primary and higher schooling acquired by individuals. Complete primary schooling is denoted by $\overline{H}_p$.

Notice that productivity of staying-at-home workers is lower than productivity of outside-home workers for any positive amount of education, implying higher earnings for the latter. Hence, we are in fact assuming that workers outside home will have greater earnings than home workers. We make this assumption for several reasons. First of all, here we want to analyse a social norm that would conflict with economic incentive – in that sense, for the problem to be interesting it has to be true that women can earn more working outside the home – otherwise there is no conflict (Elster 1989a). Secondly, this seems empirically plausible for developing countries, where home workers usually earn lower wages than workers in factories.

We assume that entrepreneurial talent at birth is distributed uniformly for males and females. The total population is P, one-half of which is female. The product attributable to a manager with r skills supervising a total quantity of labour skills

$$Q = \sum_{i=1}^{N_j} q_i \text{ is,}$$

$$Y_r = sg(r)f(Q) \tag{2.2}$$

where $f\prime \geq 0$, $f''< 0$ (diminishing returns), $g\prime > 0$, s is the current state of technology, which is a nonrival, nonexcludable good, and N_j denotes the number of workers hired by firm j's entrepreneur.[88]

The form $g(r)$ can be thought of as the analytical representation of the quality of management decisions, so that greater r implies greater $g(r)$. In other words, higher-quality managers make better management decisions. In particular, the term $g(r)$ gives a representation of the quality of the entrepreneur who is running the firm, so that there are multiplicative productivity interactions.[89] It also captures the idea that the quality of managers is embodied. This formulation implies scale economies since the marginal product of the additional quality of workers is increasing in $g(r)$. However, the diminishing returns to Q imply that this scale economy is congested so that the best manager does not take all the workers.

We assume that Y_r exhibits constant returns to scale and that f and $g(\cdot)$ are a Cobb-Douglas function; therefore we can rewrite (2.2) as

$$Y_r = sr^\alpha Q^{1-\alpha} \tag{2.3}$$

with $0 < \alpha < 1$.

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[88] We therefore add technology to the original specification in Rosen (1982).

[89] This is related to the production function used in Kremer (1993), where the author considers multiple tasks, and explains how failure of one task can have a knock-on effect on other tasks.

Next we study the occupational decision of individuals. An individual can decide between a managerial position, a working position, and production at home. We assume that an individual who engages in home production does not get any salary—therefore, whatever their level of underlying managerial talent, individuals will prefer being managers or workers in the labour market rather than engaging in the home production sector.[90]

The decision between becoming a manager or a worker does depend on the endowment of managerial talent and is analysed next.

The managers' problem

A manager with r skills faces a two-stage decision. First, how much education (primary and higher) does she want to acquire as a manager? Second, how many workers is she going to hire? She takes wages (w) as given. We solve the problem by working backward.

Stage 2:

Given skills r, the manager's problem is to choose the size of her company (or the size of her labour force, Q_r) that maximizes gross income:[91]

$$\max_Q \pi_r = sr^\alpha Q_r^{1-\alpha} - wQ_r$$

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[90] This assumption is not necessary—it is only necessary that the wage received for home production is lower than the wage from market production (which is true in this model, as market workers invest in human capital and hence they are rewarded by their higher productivity), which is necessary to have a conflict with economic incentive (Elster 1989a).

[91] The manager's gross income is profits, while net income corresponds to profits minus total cost of education; net income is ignored here because it plays a role only in stage 1.

where the price of output is normalized to one and w is the market efficiency price for Q_r (which we call the wage), so that the amount Q_r of worker skills that maximizes profits is given by the first-order condition:

$$Q_r = \left[\frac{s(1-\alpha)r^\alpha}{w}\right]^{\frac{1}{\alpha}} \tag{2.4}$$

Equation (2.4) is the demand function for worker skills for the firm, which determines the size of the firm. The greater the manager's skills (r), the larger is her firm; the higher the wage, the lower the hiring; and the better the technology (s), the more workers are hired by r. We can rewrite managers' gross income as:

$$\pi_r = \left[s^{\frac{1}{\alpha}}w^{\frac{-(1-\alpha)}{\alpha}}\alpha(1-\alpha)^{\frac{1-\alpha}{\alpha}}\right]r \tag{2.5}$$

That is, the profit is a linear function of skills, where the factor of proportionality is a combination of wages and technology.

Stage 1:

Given that she knows that she will be rewarded according to (2.5), the manager chooses a level of human capital that maximizes her net income. We distinguish between primary and higher education, and the manager can only choose her investment in higher education because she needs to acquire $\overline{H}_p$ units of primary education in order to get to higher schooling. Therefore, we can write the manager's problem as:

$$\max_{H_{h,r}}\pi_h^{net} = \pi_r - a_p\overline{H}_p - a_hH_{h,r} \tag{2.6}$$

where a_j, $j = \{p, h\}$ denotes the cost of each unit of education of primary and higher schooling, respectively.

It makes sense to think that the opportunity cost of education is given by human time and also other inputs, which are combined in the same proportions as in the production of GDP. In particular, it makes sense that a_j and s grow at the same rate. For this reason, we assume that the cost of education evolves according to changes in GDP. That is, $a_j = \lambda_j s$ for positive constants λ_j. The first-order condition for problem (2.6) implies

$$H_h = \left[(1-c)^{\frac{1}{\beta}} \widetilde{\alpha} s^{\frac{1}{\alpha\beta}} w^{-\frac{(1-\alpha)}{\alpha\beta}} a_h^{-\frac{1}{\beta}} \right] T \tag{2.7}$$

where $\widetilde{\alpha} \equiv \alpha^{\frac{1}{\beta}} (1-\alpha)^{\frac{1-\alpha}{\alpha\beta}} (1-\beta)^{\frac{1}{\beta}}$.

That is, since $a_p \overline{H}_p$ is a fixed cost to entrepreneurs, it enters their net income function (2.6) but does not affect their marginal decisions.

Using (2.1) and (2.7), we see that a manager's skill is optimally determined as a function of entrepreneurial talent at birth:

$$r = \left[c\overline{H}_p + (1-c)^{\frac{1}{\beta}} s^{\frac{1-\beta}{\alpha\beta}} w^{-\frac{(1-\alpha)(1-\beta)}{\alpha\beta}} a_h^{-\frac{1-\beta}{\beta}} \widehat{\alpha} \right] T \tag{2.8}$$

where $\widehat{\alpha} \equiv \widetilde{\alpha}^{\frac{1}{\beta}}$.

Notice that there is a linear relationship between the person's underlying entrepreneurial talent, T, and her managerial skills, r. Substituting (2.7) and (2.8) into (2.6) and (2.5) allows us to write managers' net income as a linear function of talent

at birth:

$$\pi_T^{net} = \left[c\bar{\alpha}\overline{H}_p s^{\frac{1}{\alpha}} w^{-\frac{1-\alpha}{\alpha}} + (1-c)^{\frac{1}{\beta}} s^{\frac{1}{\alpha\beta}} w^{-\frac{1-\alpha}{\alpha\beta}} a_h^{-\frac{1-\beta}{\beta}} \right] T - a_p \overline{H}_p \qquad (2.9)$$

where $\bar{\alpha} \equiv \alpha(1-\alpha)^{\frac{1-\alpha}{\alpha}}$. That is,

$$\pi_T^{net} = \Psi(\underset{(-)}{w}, \underset{(+)}{s}, \underset{(-)}{a_h}) \cdot T - a_p \overline{H}_p$$

Managers' net income is depicted as in the profit line in Figure 2.2.

Since s and a_h are proportional, then Ψ is homogeneous of degree one in s (because the wage rate will also grow at the same rate as s). That is, since s and a_j grow at the same rate, in the steady state profits, wages and, therefore, GDP all grow at the same rate. However, H_h will remain constant over time.

The workers' problem

(Market) workers earn qw as gross income. They can increase their productivity (q) by studying. Education for workers is primary education, with unit cost equal to a_p. Since the maximum amount of primary schooling is $\overline{H}_p$, more schooling does not benefit workers. Using (2.1), we can write the problem of workers as

$$\max_{H_p} I_w^{net} = wq - a_p H_p$$

$$s.t.\ H_p \leq \overline{H}_p$$

$$q = 1 + H_p^{\sigma}$$

The optimal investment in primary education by workers is given by the first-order condition

$$H_{p,w} = \left[\frac{w\sigma}{a_p}\right]^{\frac{1}{1-\sigma}} \tag{2.10}$$

The optimal decision in (2.10) is smaller than $\overline{H}_p$ as long as the wage rate is relatively low, in particular, as long as

$$w \leq \frac{a_p \overline{H}_p^{1-\sigma}}{\sigma}. \tag{2.11}$$
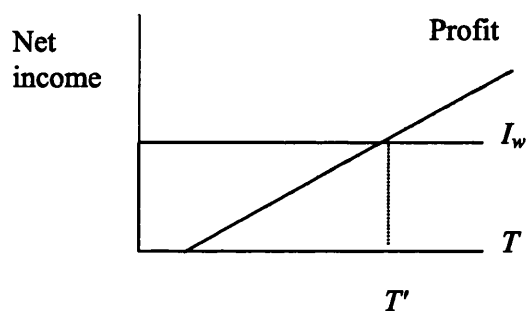
Figure 2.2 Net income schedules for workers and managers

Also, according to (2.10), the human capital investment for all workers is the same, regardless of underlying entrepreneurial talent. As long as the cost of schooling is the same, we can write

$$I_w^{net} = w + w^{\frac{1}{1-\sigma}} a_p^{-\frac{\sigma}{1-\sigma}} \hat{\sigma},$$

where $\hat{\sigma} \equiv (1 - \sigma)\sigma^{\frac{\sigma}{1-\sigma}}$. That is, the workers' net income is increasing in the wage rate and decreasing in the cost of schooling. The net income schedule for workers

as a function of T is drawn in Figure 2.2. It is a horizontal line in T because the underlying managerial talent is only useful for managers.

The determination of workers and managers

In Figure 2.2, we see that individuals with underlying entrepreneurial talent less than $T\prime$ optimally decide to be workers, while those with more underlying entrepreneurial talent than $T\prime$ optimally decide to be managers. We call $T\prime$ the cutoff level of talent since this is the level of underlying talent of the least-talented manager in the economy.[92]

Proposition 1 *A decrease in wages decreases the cutoff level of talent in the economy.*

Proof. see appendix. ∎

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[92] The single-crossing property in the model, which determines who will be a manager and who will be a worker according to latent talent, is a simple feature in Rosen (1982) that we get with only assuming that net income schedules have different slopes (see footnote 88). Here we endogenise income schedules for two reasons: first, in order to see how a change in the labour market equilibrium affects occupational decisions of individuals and hence potential distortions, and second, to study the role of human capital.
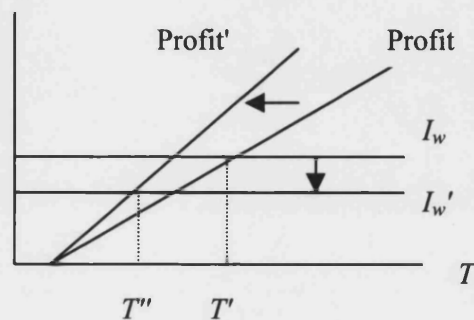
Figure 2.3 Effects of a decrease in wage rates

The intuition of Proposition 1 is that, when wages fall, the incentive to be a manager increases. Since talent is uniformly distributed, some of those who were previously workers now decide to be managers, so that the least-talented manager is less talented than was the case at the higher level of wages.

As shown in Figure 2.3, a decline in wages, which entails a decline in workers' net income from I_w to I'_w and hence an increase in profits, from $Profit$ to $Profit\prime$, unambiguously results in a decline in $T\prime$, the cutoff level of talent of managers, to $T_{\rfloor}$.

2.4.2 Labour market equilibrium without gender discrimination

In order to solve for the equilibrium wage rate w, we need to compute the aggregate supply and demand for worker skills. Notice that in this scenario, no individual engages in home production, because they get higher income from working as either workers or managers.

Aggregate supply of workers' skills without gender discrimination

We assume that the distribution of initial talent is uniform between 0 and 1 (Figure 2.4).
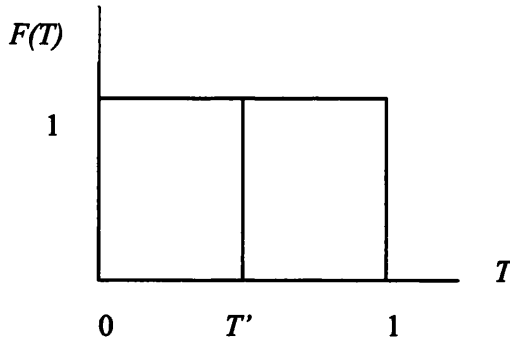
Figure 2.4 Distribution of underlying managerial talent in population

The fraction of the entire population that becomes workers is the integral between 0 and $T\prime$. From (2.9) we know that each of them will acquire the same amount of education, so that the skill of each worker is

$$q = 1 + \left[\frac{w\sigma}{a_p}\right]^{\frac{\sigma}{1-\sigma}}.$$

The aggregate supply of worker skills (Q) is, hence, given by

$$Q_S^{ND} = \int^{T(w^{ND})} P\left[1 + \left[\frac{w^{ND}\sigma}{a_p}\right]^{\frac{\sigma}{1-\sigma}}\right] dT = P \cdot T\prime(w^{ND}) \left[1 + \left[\frac{w^{ND}\sigma}{a_p}\right]^{\frac{\sigma}{1-\sigma}}\right],$$

$$(2.12)$$

where ND stands for nondiscrimination. As we showed in Proposition 1, the cutoff level of talent is an increasing function of the wage rate. Hence, the supply of workers is an increasing function of the wage rate for two reasons. First, higher wages lead to

more workers and fewer managers (this is represented by the $T\prime(w)$ term). Second, higher wages increase the incentive to acquire worker skills. Note than even if we do not allow workers to acquire skills, the labour supply is still upward sloping.

Aggregate demand for worker skills without gender discrimination

Each firm's demand for worker skills is given by (2.4). There is a one-to-one relationship between managerial skills (r) and underlying entrepreneurial talent (T), given by (2.8), so that we can write the demand for labour of one firm in terms of T:

$$Q_T = s^{\frac{1}{\alpha}}(1-\alpha)^{\frac{1}{\alpha}}w^{ND\frac{1}{\alpha}}\left[c\overline{H}_p + (1-c)^{\frac{1}{\beta}}s^{\frac{1-\beta}{\alpha\beta}}w^{ND^{-\frac{(1-\alpha)(1-\beta)}{\alpha\beta}}}a_h^{-\frac{1-\beta}{\beta}}\widehat{\alpha}\right]T \equiv \mu(\underset{(-)}{w^{ND}}, \underset{(+)}{s}, \underset{(-)}{a_h})T$$

The aggregate demand for worker skills is the sum of individual demands across all entrepreneurs; this demand can be represented as the individuals from the cutoff level of talent ($T\prime$) to talent equal to 1 (Figure 2.3), multiplied by P, the total population:

$$Q_D^{ND} = \int_{T\prime(w^{ND})}^{1} \mu(w^{ND}, s, a_h)T \cdot P \cdot dT = P\mu(w^{ND}, s, a_h)\left[\frac{1}{2} - \frac{T\prime^2(w^{ND})}{2}\right].$$

$$(2.13)$$

Holding constant $T\prime$, the aggregate demand for worker skills is decreasing in wages, increasing in technology, and decreasing in the unit cost of higher education. Holding these three constant, aggregate demand for worker skills is decreasing in $T\prime$. Since we showed that $T\prime$ is increasing in wages, it follows that the aggregate demand function depends negatively on wages for two reasons. First, as wages increase, each firm will demand fewer workers. Second, when wages rise, the cutoff level of talent

increases, that is, fewer people want to be managers and the number of firms demanding workers declines. Hence, the overall effect of wages on labour demand is negative.

The equilibrium wage rate is given by the equalization of (2.12) and (2.13), as seen in Figure 2.5.
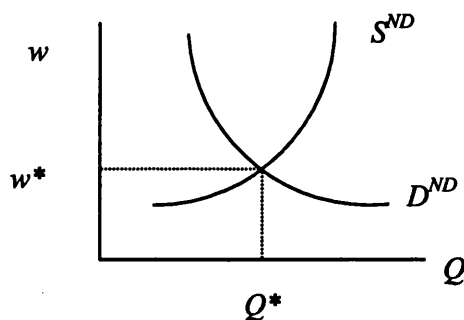
Figure 2.5 Labour market equilibrium

The number of entrepreneurs

Let the total number of managers be M, which is the sum of male and female entrepreneurs, $M = M_f + M_m$. Since males and females are each one-half of the total population, and both genders are assumed to have the same underlying entrepreneurial talent, the total number of entrepreneurs without discrimination is

$$M^{ND} = M^{f,ND} + M^{m,ND} = \frac{P}{2} \int_{T'(w^{ND})}^{1} 1 dT + \frac{P}{2} \int_{T'(w^{ND})}^{1} 1 dT = \left[1 - T'(w^{ND})\right] P.$$

(2.14)

Economic growth

How does the allocation of talent determine the growth rate of the economy? We assume that the increase in technology is determined by three factors.

First, we consider that one determinant of growth is the average quality of ideas in the economy, where the quality of ideas can be represented by the underlying entrepreneurial talent of managers (this is the *innovation* aspect of growth).[93] The reason is that managers are heterogeneous, implying that the average quality of ideas will be a combination of good and bad ideas. Whether an idea is good or bad is apparent only after it has been tried out. If the idea turns out to be good, then it is adopted and the level of technology increases. If it is bad, time and effort are wasted without any benefit. If more talented people tend to have good ideas and less talented people tend to have bad ideas, then people with smaller-than-average talent will tend to hurt the economy. Hence, one important factor is the average talent of managers.

Second, we assume that economic growth also depends positively on the average workers' productivity (*adoption* aspect of growth).[94] The intuition is that more productive workers will be more able to follow the manager's instructions and hence will adopt innovation better.

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[93] This is related to Murphy *et al* (1991), where it is assumed that technology is determined by the underlying entrepreneurial talent of the most talented of the entrepreneurs.

[94] These two factors are related to Acemoglu *et al* (2002), who assume that there is an innovation and adoption or investment dimensions to growth; however in their setting there is a trade-off between the two dimensions.

Finally, we assume that there is a residual dimension to growth that is related to health issues and is basically determined by the education of individuals who engage in home production. The intuition is that, even if some people in the economy may not work in the labour market, increasing their education increases growth because they become more aware of e.g. health issues (this is empirically plausible especially in developing countries).[95]

In particular,

$$s(t) = s(t-1)\left[1 + f\left(AT(T'(w)), AP(H_p(w)), NE\right)\right],$$

where $f\prime$ is positive in all of its arguments and AT denotes average talent of managers, AP denotes average workers' productivity, and NE denotes average education of individuals who engage in home production.

Then it follows that the rate at which technology, costs of education, wages, and profits grow in this economy is some combination of AT, AP, and NE (in case there are home workers). Therefore, the growth rate of the economy is given by some

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[95]   Pritchett and Summers (1996) and Martin *et al* (1983) provide empirical evidence for less developed countries that higher levels of education (controlling for income) are associated with lower levels of infant and child mortality. Rajna *et al* (1998) estimate that, even controlling for socioeconomic factors, illiterate women in Uttar Pradesh (India) face a 1.6 times higher risk of later childhood deaths of their children compared with women educated to at least the middle school level. More generally, recent evidence (Topel 1999, Krueger and Lindahl 2001) suggests there is a positive correlation between education and economic growth (using both the change and initial level of education).

combination of

$$AT = \frac{1}{2}[1 + T'(w)]$$

$$AP = 1 + H_p(w)$$

$$NE = H_p(0). \tag{2.15}$$

2.4.3 Labour market equilibrium with gender discrimination in managerial positions

We now consider the implications of gender discrimination. We analyse two cases. First, gender discrimination can occur in managerial positions (that is, the case in which women are not allowed to be entrepreneurs). In the next section, we look at the stronger case of discrimination in which women cannot take part in the labour force either as managers or as workers. We refer to the former as partial discrimination (PD), and the latter, as total discrimination (TD). Instead, we could model partial discrimination assuming that setting a firm requires a fixed investment, such that the entrepreneur has to borrow some amount of money. Then partial discrimination would for instance consist of women facing higher interest rates in the credit market. For interest rates high enough, no female would decide to be an entrepreneur. That is, this type of discrimination in the labour market could be the result of discrimination in the credit market.[96] A more subtle way to think about this is in the context of a low

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[96] In what would be the opposite case, Coate and Tennyson (1992) show that, under some condition, individuals who are discriminated against in the labour market will face higher interest rates and will hence have less incentive to enter self-employment than those who are not discriminated against, even after allowing for investments in human capital. In both cases though, discrimination in one market spills over to another market.

self-esteem hypothesis: suppose that individuals cannot observe their endowment of T, the underlying managerial talent, and that women are told (e.g. by society in general) that they are not talented enough to be managers—this would become self-fulfilling in the sense that women will not invest into higher education and will then disproportionately fill working positions (Akerlof and Kranton 2000).

Aggregate supply of worker skills with partial gender discrimination

Suppose gender discrimination consists of not allowing women to have access to managerial positions. Women, however, may still have access to schooling and worker positions. Notice that since earnings as home worker are zero, women who would be managers without discrimination will still prefer to work in the labour market (even as workers) and earn wages than to engage in home production. Therefore, in this scenario no individuals become home workers. For every wage, partial discrimination affects the demand and supply of worker skills. The supply of workers will tend to increase because all women are now workers:

$$Q_S^{PD} = \frac{P}{2}T'(w^{PD})\left[1 + \left[\frac{w^{PD}\sigma}{a_p}\right]^{\frac{\sigma}{1-\sigma}}\right] + \frac{P}{2}q(w^{PD}) = P\left[1 + \left[\frac{w^{PD}\sigma}{a_p}\right]^{\frac{\sigma}{1-\sigma}}\right]\left(\frac{T'(w^{PD}) + 1}{2}\right).$$

$$(2.16)$$

Since $T'(w) < 1$, the rightmost term is larger than $T'(w)$. Hence, for every wage, the supply curve with partial discrimination is to the right of the curve without discrimination.

Aggregate demand for worker skills with partial gender discrimination

Demand for worker skills will tend to fall because there are no female managers:

$$Q_D^{PD} = \int\limits_{T'(w^{PD})}^{1} \mu(w^{PD}, s, a_h) T \frac{P}{2} dT = \frac{P}{2} \mu(w^{PD}, s, a_h) \left[\frac{1}{2} - \frac{T'^2(w^{PD})}{2} \right].$$

For every wage, demand for worker skills is one-half of what it was without discrimination. In other words, the demand curve with partial discrimination is to the left of the curve without discrimination. Hence, the equilibrium wage unambiguously declines (see Figure 2.6). The change in the total quantity of worker skills that is hired in equilibrium is ambiguous because, with discrimination, we have higher supply and lower demand.

The intuition is that, for a given wage rate, the human capital investment decisions of men and the cutoff level of talent for men remain unchanged. Hence, discrimination against women in managerial positions has two consequences. First, it increases the supply of workers, as all women become workers. Second, it decreases the demand for workers, as all firms that would have been headed by women

no longer exist. Both factors work to lower the wages of workers.
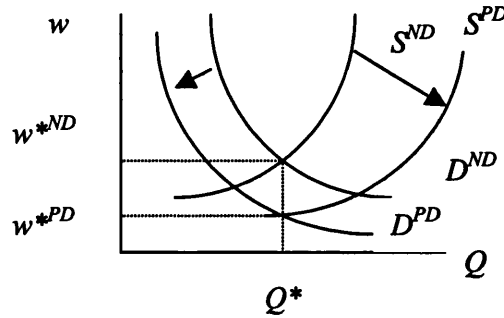
Figure 2.6 Labour market equilibrium, partial discrimination

The number of enterpreneurs with partial gender discrimination

In this case, the total number of female managers is zero (by definition); at a given wage, therefore, the total number of entrepreneurs will decline. Since the equilibrium wage is lower, the cutoff level of talent for the remaining male managers is lower, so more males are going to become entrepreneurs. Hence, the total number of managers is

$$M^{PD} = M^{m,PD} + M^{f,PD} = \frac{P}{2} \int_{T'(w^{PD})}^{1} 1 dT + 0 = \left[1 - T'(w^{PD})\right] \frac{P}{2}.$$

Since $T\prime(w^{PD}) < T\prime(w^{ND})$ while $\frac{P}{2} < P$ (that is, the number of male managers is larger because of lower wages while the number of female managers drops to zero), the overall effect of this type of discrimination on the number of entrepreneurs is ambiguous. Since the fraction of the population who are managers $(1 - T\prime)$ is very small, it is possible that we end up with more managers when there is partial gender

discrimination, because a higher proportion of men will decide to become managers; it depends on the sensitivity to wages of the cutoff level of talent for males and the sensitivity of the wage rate to the requirement that all women work as workers. In sum, the change in the number of entrepreneurs is ambiguous, but it is likely that the decrease in the number of managers due to the prohibition of female managers is larger than the increase of male managers due to the lower equilibrium wage.

Proposition 2 *For wages high enough, workers complete primary school even in the case of partial discrimination (which implies a wage cut). In that case, the ratio of female-to-male primary education is the same as without discrimination, that is, equal to one. However, for wages low enough, the ratio of female-to-male primary education is lower in the case of partial discrimination than in the absence of discrimination.*

Proof. see appendix. ■

Corollary 3 *For developed countries, where wages tend to be high, there is no gender inequality in primary education even in the case of partial discrimination. In contrast, for developing countries, where wage rates tend to be low, partial discrimination implies gender inequality in primary education.*

Propositions 3 and 4 establish the implications of the effects of partial discrimination from the first case (developing countries), which is empirically the most plausible:

Proposition 4 *Discrimination against females in managerial positions implies (i) lower female education than without discrimination, (ii) more education for male managers and less education for male workers, and (iii) lower average education for females than for males in both primary and higher education.*

Proof. On the one hand, by (2.10) lower equilibrium wages imply that workers will optimally invest less in education. Therefore it follows that females (who cannot become managers by definition) will all invest less in education. The same applies for male workers. By (2.7), lower wages on the other hand imply that male managers will increase their investment in higher education (primary education for managers is fixed). Finally, females have lower average education than males in both primary and higher education, since (1) females who were managers without discrimination will, with partial discrimination, reduce their investment in primary education as workers because the returns are lower, and (2) women who were workers without discrimination reduce their acquirement of primary studies. ∎

The change in average male education is however ambiguous because the change in the number of managers is ambiguous.

Proposition 5 *Discrimination against females in managerial positions implies lower economic growth.*

Proof. Lower equilibrium wages in the case of partial discrimination implies, according to Proposition 1, a lower cutoff level of talent. On the one hand, according

to (2.15), the latter in turn implies that the average talent of entrepreneurs is smaller (which leads to less innovation). On the other hand, workers' productivity depends on their primary education, which in turn depends on wages. By Proposition 3 we know that male workers optimally decide to study less than without discrimination, so average workers' productivity is lower (leading to less adoption). Both factors imply a lower rate of economic growth. ∎

Therefore discrimination in the form of a social norm that does not allow women to be managers has negative implications for growth.

Discrimination in higher education

A similar conclusion might be reached through an alternative type of discrimination. Suppose that girls face a larger cost of higher schooling than boys, that is, $a_{h,f} > a_{h,m}$. This could be the result of a social norm according to which women are not expected to enter the labour force in the future. In that case parents pay for their daughter's primary education if they have the means but not the extra amount needed for higher education, because there are no private gains from girls' higher education. Then it can be shown that since women face lower incentives to be managers, in equilibrium wages are lower than without discrimination, and a larger proportion of men than of women become managers—nevertheless those women who become managers are on average more talented than male managers, even though their average education will be lower than their male counterpart. Furthermore, under a certain

condition it can be shown that this situation lowers the average cutoff level of talent and hence economic growth.

2.4.4 Labour market equilibrium with total gender discrimination in the labour market

Aggregate supply of worker skills with total gender discrimination

Suppose gender discrimination consists of not allowing women to have access to managerial positions or to become workers. We interpret this as a social norm that is enforced by the existence of social stigma, in the same spirit as Goldin (1995) and Mammen and Paxson (2000) describe social stigma as a deterrent to women's participation in the labour market.[97] In particular, Goldin (1995) models this social stigma as a cost to the household: each family has a value S giving the utility that would be lost from the social stigma of having a wife work for wages ("only a husband who is lazy, indolent, and entirely negligent of his family would allow his wife to do such labour"). This cost is not a function of the number of hours at work but is "all or none". In this study, in order to see the aggregate costs of such social stigma, we assume that the cost that this social norm or stigma represents is large enough for women to turn to the home production sector. This could be modeled in an intra-household context, as in Goldin (1995), and the result would be the same.

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[97] More precisely she associates social stigma to having a wife work as a manufacturing operative or manual labourer.

In this case, females' human capital is zero because, in this model, education is only useful to individuals who take part in the labour market. For every wage, this affects the demand and supply of worker skills. Supply in this case is

$$Q_S^{TD} = \frac{P}{2}T'(w^{TD})\left[1 + \left[\frac{w^{TD}\sigma}{a_p}\right]^{\frac{\sigma}{1-\sigma}}\right]. \tag{2.17}$$

Hence, for a given wage, the supply of worker skills is one-half of the supply without gender discrimination.

Aggregate demand for worker skills with total gender discrimination

As in the case of gender discrimination in managerial positions, demand for worker skills is simply one-half of what it was without discrimination:

$$Q_D^{TD} = \int_{T'(w^{TD})}^{1} \mu(w^{TD}, s, a_h)T\frac{P}{2}dT = \frac{P}{2}\mu(w^{TD}, s, a_h)\left[\frac{1}{2} - \frac{T'^2(w^{TD})}{2}\right].$$

Hence, relative to the situation of discrimination in managerial positions, the equilibrium wage unambiguously increases, while the amount of worker skills hired in equilibrium decreases (see Figure 2.7). Unlike in the nondiscrimination case, since both aggregate supply of, and demand for, worker skills change in the same proportion, the wage rate is the same, although in the total discrimination equilibrium less

worker skills are hired.
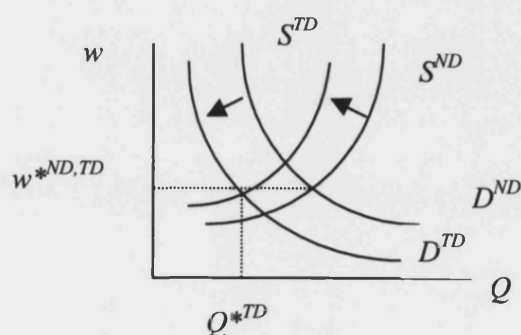
Figure 2.7 Labour market equilibrium, total discrimination

The number of managers with total gender discrimination

The total number of managers is

$$M^{TD} = M^{m,TD} + M^{f,TD} = \frac{P}{2} \int_{T'(w^{TD})}^{1} 1dT + 0 = \left[1 - T'(w^{TD})\right] \frac{P}{2}. \qquad (2.18)$$

Since the equilibrium wage rate increases, the number of managers is unambiguously smaller than in the case of discrimination in managerial positions. By (2.14) and (2.18), and given that the cutoff level of talent with total discrimination is the same as without discrimination, the number of managers with total discrimination is one-half of the number without discrimination. Propositions 6 and 7 summarise the effects of total gender discrimination.

Proposition 6 *Gender discrimination in the overall labour market implies that (i) average female education is lower, for both primary and higher education, (ii) male*

education is the same as without discrimination, and (iii) average female education is lower than male education.

Proof. (i) follows from the fact that in the model, education is only useful if in the labour market, while (ii) follows from (2.7) and (2.10). Finally, (iii) follows from (i) and (ii). ■

Proposition 7 *Gender discrimination in the overall labour market implies (i) lower economic growth, and (ii) lower per capita GDP.*[98],[99]

Proof. (i) follows from the residual determinant of economic growth, as some individuals (half the population—all females in the economy) who were previously working outside the home and hence investing in some positive level of education in the existence of discrimination optimally decide not to get any education. Part (ii) follows from the fact that population is the same as without discrimination while women who were managers or workers without discrimination have to engage in home production with discrimination, which is less productive than production outside the home; hence per capita GDP decreases. ■

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[98] Hence this prediction of total gender discrimination is similar to the one from the model in Galor and Weil (1996) where, taking into account fertility and assuming two different types of skills among individuals, as long as women do not participate in the labour force the rate of economic growth declines over time.

[99] This is consistent with no scale effects in the sense that the average talent of managers and the average productivity of (market) workers are the same as without discrimination.

2.4.5 Discussion: sustainability of gender discrimination

After analysing the negative consequences of discrimination we must explore the reasons why discrimination can persist. This may be particularly unclear in the case that the total household income, i.e. of husband and wife, is lower as a consequence of discrimination. In the context of a unitary model of the household, discrimination could not persist. A bargaining approach is needed to understand sustainability.[100]

For instance, a man who is married to a woman who is a manager in a situation of no discrimination may be worse off by the introduction of partial discrimination (where she can only be a worker) or total discrimination (where she cannot participate in the labour market), due to the fact that her income decreases. However, in the case of partial discrimination, this also depends on whether the husband's own working status (and hence his income) change due to discrimination.

Since our aim is to address the sustainability of discrimination, we use nondiscrimination as a benchmark and compare it to either partial discrimination or total discrimination.

How is this relevant for the cases of discrimination explored in this paper? From the point of view of a cooperative bargaining framework, where the threat point is divorce, the individuals' bargaining strength depends positively on their own outside option, while depends negatively on their partners' outside option. That is, in general, if the woman's earnings increase with the suppression of discrimination,

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[100] Additionally, empirical evidence seems to reject the unitary model, in particular, income pooling is rejected (Mansen 1993, Thomas 1993).

her outside option is stronger (as she would still be able to earn a wage in the case of divorce), which would decrease the husband's utility.[101] Generally, however, to the extent that the woman's participation in the labour market increases the size of the cake, this would increase the husband's utility (note that this is not always true, as in the case of males that are workers with the suppression of partial discrimination but are managers under partial discrimination).[102]

Nevertheless, the type of discrimination in this chapter is more consistent with the predictions of a model of (noncooperative) separate spheres bargaining, as introduced by Lundberg and Pollak (1993), for several reasons. A perhaps subtle reason is that cooperative bargaining requires the threat point to depend on divorce, while in developing countries with very unequal gender relations, such as India and other countries relevant for this analysis, divorce either involves substantial transaction costs or can be dominated by sharing public goods within an intact but noncooperative marriage, where a division of labour based on socially recognized and sanctioned gender roles emerges without explicit bargaining. In this case, the relevant threat point is not divorce but the noncooperative, voluntary equilibrium within marriage. Cooperative bargaining is distinguished by the ability of players to make binding agreements within marriage. Then, as shown by Lundberg and Pollak (1993), it will

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[101] In the cooperative bargaining model the increase in the wife's earnings can be either represented by an increase in her outside option or an increase in her weight in the maximisation problem.

[102] In the case of men who are workers even without discrimination, if their wife's outside option increases in the same proportion as the total cake, then they are not better off by the removal of discrimination. Notice that this is the relevant comparison if there is assortative matching. The analysis is the same in the case of the suppression of total discrimination.

be optimal for couples with high transaction costs (which arise because of the negotiation, monitoring, and enforcement of such agreements) or low expected gains from cooperation to remain at the stereotypical noncooperative solution, where the division of labour is based on socially recognised gender roles. More importantly, the argument that cooperation does break down seems especially appropriate in the case of India, where borrowing constraints are severe and therefore agents have low discount rates.

Let us use an example as illustration. Think of couple A, where Mr A is not very talented in terms of managerial ability (T) and therefore would naturally choose to be a worker, while Mrs A is relatively more endowed with managerial talent and therefore she optimally is a manager (under no discrimination). Would cooperation work? We can think of the surplus from cooperation as being positively given by total income and negatively given by the male disutility from her wife's higher occupation (this could be some sort of stigma or simply the fact that he is teased by colleagues) or the fact that she is working. We can think of some sort of distribution of this disutility among males—for some males it may be equal to zero, for others, infinite—so as long as the disutility is larger than income, cooperation can break down.

The type of discrimination here is also consistent with Akerlof's and Kranton's model of identity. As they explain in their paper, if there are gender-jobs associations (that is, some jobs perceived as 'man's jobs' and some other jobs perceived as 'woman's jobs') that are sectorwide or economywide, these might persist—which is

consistent with the empirical evidence of persistent occupational segregation—, as perfectly competitive firms will underinvest in new job categories. Hence in the absence of market power or technological change, a shift in social attitudes and legal intervention might be necessary for changes in employment patterns.[103]

Finally, there could be an issue regarding the existence of assortative matching across households. In particular, if the most talented man marries the most talented woman, it is efficient for women to work at home (or hold unskilled—less demanding— positions) as long as there is some comparative advantage of men over women in working outside home, and the cost of providing household goods and services is lower than the external market rate (Becker 1965).[104] This would undermine the misallocation of talent explored in this chapter—unless, as argued before, there are transaction costs that lead to the dominated equilibrium. We will come back to this issue after the empirical analysis.

2.5 Empirical evidence

The theoretical section provides motivation for the hypothesis that a lower number of females relative to males in (1) managerial positions and (2) worker positions as a whole has negative implications for development. In particular, the theoretical section argues that gender discrimination in managerial positions implies a misal-

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[103] For more on this and its link to social norms, see the introduction to this thesis.

[104] The model is in this feature similar to the one in Francois (1998), where gender discrimination is inefficient (in particular, there are gains from trading occupations within the household) only when members in the household differ.

location of talent that leads to lower economic growth through the innovation and adoption dimensions of economic growth, while gender discrimination in the overall labour market has negative economic consequences through the education dimension of growth. We test the implications of the theoretical section using data from sixteen Indian states that cover 95% of India's population over 1961-1991. The output measure we use is the log of per capita real output.[105]

We do not expect that the argument in the previous sections can apply to agricultural workers: in the case of agricultural jobs, it makes sense to think that there exist comparative advantage reasons favouring men, who have physical advantages in carryint out many agricultural tasks. For that reason, the measure of workers that we use does not include agricultural workers. However, we do use agricultural workers for robustness checks.

The gender discrimination measures that we use are based on the number of female and male (1) managers and (2) workers.[106],[107] We expect the ratio of female-to-male managers or workers to partly reflect gender inequality that is driven by gender discrimination, as of the types described in the theoretical section.[108] In constructing the ratios, we divide by the respective populations.

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[105] Therefore differences in prices across states are controlled for. The deflator that we use takes into account rural and urban prices (Besley and Burgess 2002, 2004).

[106] The variable we call *managers* corresponds to the variable that is called *employers* in the Census of India and is described as "a person who had necessarily to employ other persons in order to carry on the business from which he served his likelihood." See the data appendix for definitions.

[107] 'Workers' includes 'managers' and other kinds of workers as described in the data appendix.

[108] Indeed, even in states where agriculture is the predominant activity, there is no reason for female-to-male ratios to be biased. Moreover, the fact that agriculture-related jobs are usually more unsecure and lower paid points towards a situation which could be discriminatory in origin.

Figures 2.8 and 2.9 show the evolution of these variables over time. They are basically U-shaped but in some states, notably Punjab, Haryana and West Bengal.

Graphs by statename
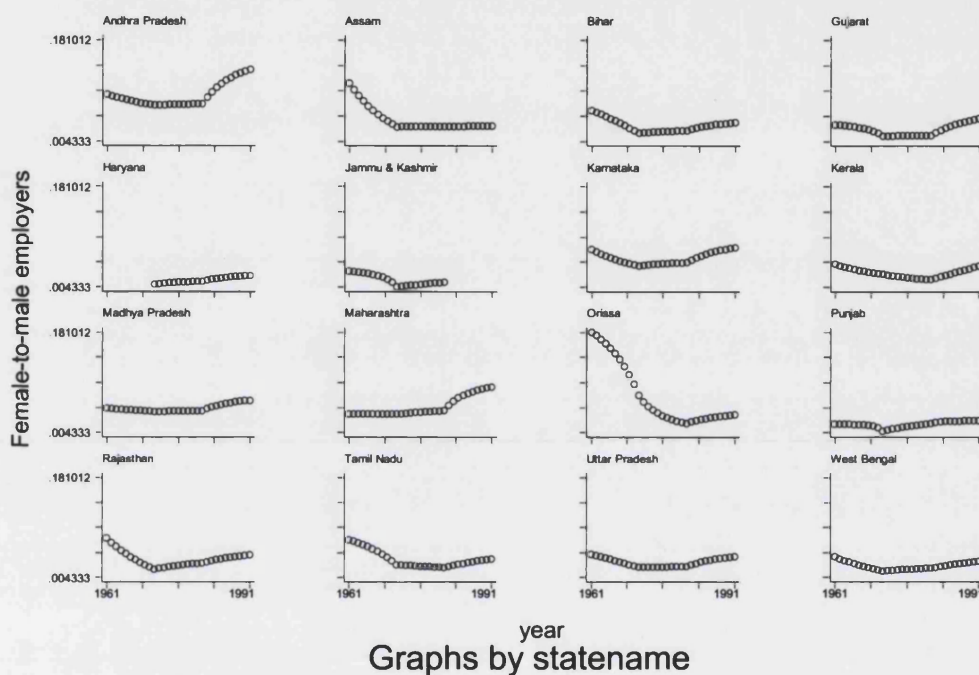
Figure 2.8 Ratio of female-to-male managers, 1961-1991

In Table 2.1 we present means and standard deviations of the main variables used in the empirical analysis, by state, averaged for the period 1961-1991. Typically, states with the highest ratios of female-to-male managers and workers are southern states (Karnataka, Kerala, Andhra Pradesh) while states with the lowest ratios are usually in North India (Haryana, Jammu and Kashmir, Punjab). Interestingly, there is no strong direct relationship between these variables and income. For instance, Haryana and Punjab are relatively rich, while Jammu and Kashmir is at about the

all-India average income. There is also diversity among states with higher female-to-male worker ratios: Kerala and Orissa have lower-than-average income, while Andhra Pradesh and Karnataka have approximately average income. In fact, it seems that as explained in the background section, these statistics would in fact tend to suggest that female labour participation relative to male in the non-agricultural sector is higher in poorer states.
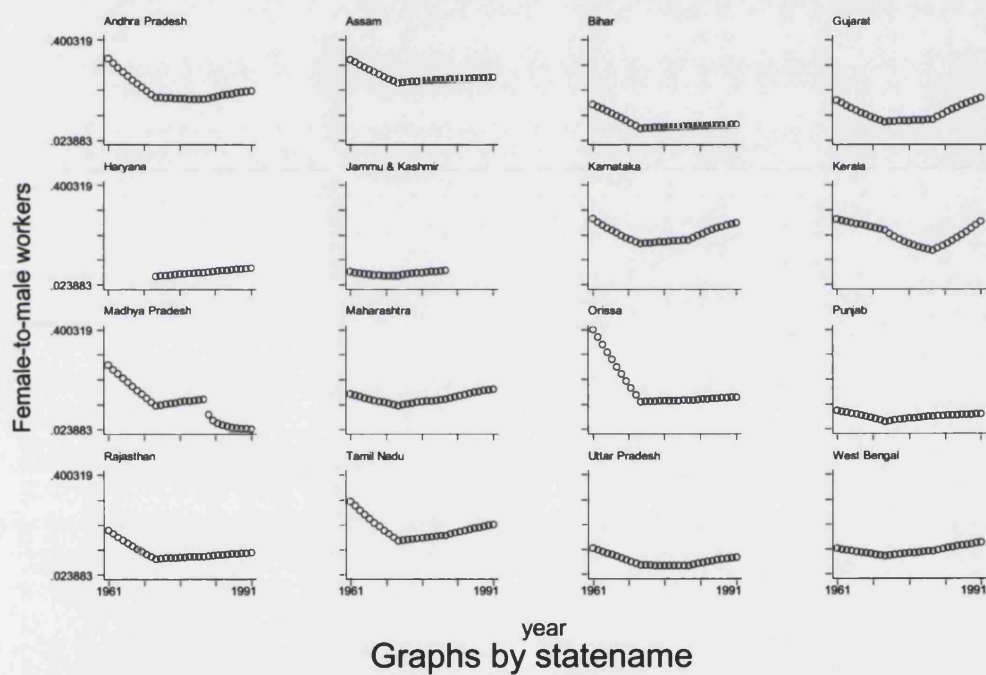
Figure 2.9 Ratio of female-to-male workers, 1961-1991

If we look at the shares of workers by sector (Table 2.2), a majority of women works in agriculture in every state. However, there is not a strong correlation between the share of female workers in agriculture and its male counterpart: for instance in

Maharashtra 86% of women workers work in agriculture, while 55% of men do the same. For Kerala numbers are more similar: the female share is 58% while the male share is 42%. Consequently, the correlation coefficient between those two variables is positive but below 15%.

We take advantage of the panel nature of the data and run regressions of the type:

$$y_{st} = \alpha_s + \gamma_t + \delta r_{st} + X_{st}\xi + \varepsilon_{it} \tag{2.19}$$

where y is the logarithm of per capita real net state domestic product, r denotes the ratio of the number of females to males in a certain class of the labour force (namely managers and workers), X denotes controls (human capital, and other socioeconomic controls such as population growth, the ratio of urban to total population, and the ratio of capital to labour), α is a state effect, and γ is a year fixed-effect. State effects pick up effects that vary among states but are constant over time, as well as heterogeneous initial conditions; year effects pick up shocks that are common to all states but differ over time.

In light of recent research about fixed-effects panel models estimation (Bertrand *et al* 2003, Kézdi 2002) showing that the cluster estimator behaves well with finite samples, we cluster our standard errors by state to deal with concerns with serial correlation.

In Tables 2.3 and 2.4 we present the results of estimating (2.19) for the ratio of female-to-male managers and workers respectively. Columns (1) in both tables

represent the basic results in the paper: in line with the theory, the estimates show that gender discrimination acts as a brake on economic development. As argued before we use non-agriculture worker ratios therefore the dependent variable we use here is the log of non-agricultural per capita ouptut in real terms.[109] In column (1) in Table 2.3, the ratio of female-to-male managers is positively related to output, and this relationship is significant at the 1 percent level, controlling for female and male literacy rates, population growth, the ratio of urban to total population, and the ratio of capital to labour (the latter is introduced as a proxy for technology). In column (2) we add some controls for policy/institutional quality. There exists the possibility that our variable of interest might be capturing some other sort of policy that is undertaken at the state level, hence being significant due to omitted policy bias. Even though gender sensitive legislation and policy-making exist only at the national level, some other type of policy at the state level might happen to be related to gender-wise work participation. We cannot possibly control for any state-level policy but we can follow the strategy in Besley and Burgess (2002) and control for government responsiveness using the following political controls: electoral turnout lagged one period, a measure of political competition (the absolute difference in the share of seats occupied by the main political party and its main competitor), and a dummy for election years. Results, in column (2), are unchanged. Therefore our results are robust to the inclusion of proxies for government and institutional quality.

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[109] Deflated using the consumer price index for industrial workers (CPIIW). The agricultural output measures are deflated using the consumer price index for agricultural labourers (CPIAL).

In column (3), we additionally control for caste (introducing the percentage of the population that belongs to scheduled castes or scheduled tribes) and the size of the (non-agricultural) labour force, logged. The estimated coefficients for our variables of interest are similar and still significant at the one percent. Finally in column (4) we introduce religious affiliation controls, in particular the percentage of the population who is Muslim and the percentage who is Hindu, to discard the possibility that our variables are picking up any omitted religion bias. Results remain basically the same.

Results for the ratio of female-to-male workers, in Table 2.4, are similar. The estimated coefficient is larger and also positive and statistically significant.

There is a remark to be made regarding home production. In particular, if women's participation in the labour force relative to men's has been increasing (which may have therefore decreased their—officially not accounted for—home production) along with per capita GDP, as predicted by the model, the positive effect that we find might appear because of this accounting fact rather than because of discrimination itself. However, a quick look at Figures 2.8 and 2.9 above suggests that this cannot be the case, as female-to-male ratios of managers and workers have evolved differently by state over time.

In Table 2.5 we look at effects by sector, controlling for political and socioeconomic controls, and state and year fixed-effects. In column (1), we regress agricultural output on the ratio of female-to-male agricultural labourers: indeed, we find no effect. This makes sense from a point of view of male physical comparative advan-

tage as explained above. However, in column (2), we do find that more female-to-male household workers are positively associated with greater non-agriculture output. This suggests that even as household workers, women contribute to the economy. In columns (3) and (4) we look at secondary and tertiary sectors respectively. The secondary sector includes manufacturing, while the tertiary sector includes banking, public administration, trade, construction, electricity, transport, and storage. We find no relationship with regards to the secondary sector, which again could be explained due to physical ability more important than talent in that sector, but we do find a strong effect regarding the tertiary sector. This makes sense, as it is in this sector that we expect talent, or non-physical ability, to be more important than physical ability. This result is especially interesting in light of recent evidence that the tertiary sector is the economic sector that contributes the most to poverty reduction in India (Besley *et al* 2005). If this is the case, gender discrimination that translates into low ratios of female-to-male workers in the tertiary sector not only creates an output loss but also hinders poverty reduction.

In Table 2.6 we look at the effect of female-to-male managers and workers on tertiary sector output. We find a positive significant effect of both (columns (1) and (2)). This is consistent with the results in Tables 2.3 and 2.4 with non-agricultural output: in fact, the effects in Table 2.6 are stronger, which makes sense from the point of view that it is in the tertiary sector that managerial talent plays a more important role (as opposed to physical ability, of substantial importance in manufacturing).

An obvious concern is causality. In particular, we might worry that the statistical positive relationship we are estimating is arising due to the possibility that richer states have higher female-to-male employment ratios. We try and control for potential endogeneity using the ratio of prosecutions launched to the number of complaints received under the Maternity Benefits Act (1961). According to India's First Report for the Convention on the Elimination of all forms of Discrimination against Women (CEDAW),

> *the Government of India recognizes that provision of maternity benefit is the most crucial element which affects women workers, therefore it is doing its utmost to extend maternity benefits to all women.*[110]

The administration of the Act in States is the responsibility of the Factory Inspectorates. Inspectors are appointed by the corresponding State Governments. This is a proper instrument as long as the determinants of the launch of a prosecution are not a direct determinant of per capita output. The state with largest values is the one furthest south—Tamil Nadu—with approximately average per capita income relative to other states during the period.

In order to further study the exogeneity of the instrument, we take a look at the correlation between this variable and some variables—first, log of per capita real income, but also other variables that could proxy for the level of development. In Table 2.7 we provide the estimates of regressing the ratio of prosecutions launched under the Maternity Benefit Act to the number of complaints received, controlling

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[110] For more details regarding the Maternity Benefits Act (1961) see the data appendix.

for state and year fixed effects. The number of prosecutions to complaints received is not significantly correlated with income (column (1) for total output, column (2) for the tertiary sector only), the quality of the judiciary as measured by the annual pendency rates at high courts (column (3)), and two proxies for the size of the state level budget (expenditure on the organs of the state and on administration services, in columns (4) and (5) respectively).[111] Given these results we expect differences in number of prosecutions to proxy for variation in cultural values that promote female labour force participation, hence being fairly exogenous. Therefore our prior that this variable is capturing cultural values seems validated.

We present the instrumented results in Table 2.8 and 2.9. In Table 2.8 (column (1) and (2)) we present the instrumented version of columns (4) in Tables 2.3 and 2.4 respectively. The estimated coefficients for the female-to-male ratios of managers and workers (columns (1) and (2)) are positively significant at the one and five percent level respectively.[112] Interestingly, estimated coefficients for these two variables are higher than without being instrumented, suggesting that the relationship from income to female labour participation is actually negative. This is consistent with the hypothesis that it is poorer women who engage in working activity, and that the social norm is binding. That is, if anything, endogeneity was biasing our coefficients

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[111] The quality of the judiciary is measured by annual pendency rates, where the pendency rate is constructed by Besley and Burgess (2003) by adding the number of cases pending at the beginning of the year to cases filed in the year and dividing this by cases resolved during the year.

[112] Other potential instrumental variables have been tried (e.g. the percentage of women elected for seats at state-level legislative assemblies, gender-wise turnout) and discarded because they have turned out being bad instruments at standard significance levels, in the sense that they are not correlated to female-to-male ratios of managers or workers.

downwards. Taking the results from the non-instrumented regressions, we find that an increase of 10 percent in the female-to-male ratio of managers would increase per capita net domestic product in the non-agricultural sector by 15 percent, while an increase of 10 percent in the female-to-male ratio of total workers would increase non-agricultural per capita net domestic product by 32 percent. These results suggest that gender inequality in the access to working positions is a bigger brake on growth than gender inequality in the access to managerial positions.

Results from the first-stage regressions are also presented in Table 2.8 (columns (3) and (4)). As suspected, the ratio of prosecutions launched to the number of complaints received under the Maternity Benefits Act is positively correlated with female-to-male managers and total workers, suggesting that states where more prosecutions are started have better conditions for female labour force participation (p-values for the instrument are five and eight percent respectively).

In Table 2.9 (columns (1) and (2)), we present the instrumented versions for columns (1) and (2) in Table 2.6. Again, we find that our variables of interest are positive and significant, and of greater magnitude than their non-instrumented counterparts.

The bottom line is that our main result, that gender discrimination hinders development, goes through in the instrumented regressions.

In the theoretical section we have raised the issue of how the existence of assortative matching and comparative advantage might prove discrimination efficient,

since the person (usually the husband) who works more hours outside the home is also the person who works less hours at home (Becker 1965). Although this is theoretically plausible, in light of the empirical evidence that we have just examined—whereby ceteris paribus states that have larger numbers of women at work have experienced larger per capita GDP—we conclude that this theoretical possibility is not empirically relevant, but rather, that there exist substantial transaction costs in intrahousehold bargaining so that the suboptimal, nooncoperative equilibrium can be sustained. Moreover, the efficiency costs of gender discrimination are big. This evidence can also be added to previous evidence that the comparative advantage theory of labour division in the household does not work (Akerlof and Kranton 2000 find that women who work more hours outside the home than their husbands also work more hours at home than their husbands).

2.6 Conclusion

This paper provides theoretical and empirical support for the view that gender discrimination acts as a brake on economic development. We find that a 10 percent increase in the female-to-male managers ratio in India would increase non-agricultural output per capita by 15 percent, while a 10 percent increase in the female-to-male workers ratio would increase non-agricultural output per capita by 32 percent. This is in accord with the theoretical predictions of our model, according to which gender discrimination in either managerial positions or the labour market has negative

economic consequences. The intuition is as follows. If women cannot gain access to managerial positions, the equilibrium wage rate declines, and the cutoff level of talent of managers declines as well, so that the average talent of entrepreneurs and economic growth both decline. If females cannot participate in the labour market, but have to engage in home production, the wage rate is the same as without discrimination, so that the cutoff level of talent is the same and, therefore, there are no innovation or adoption implications. Nevertheless, growth decreases due to the fact that half the population acquires zero education. Moreover, the theory predicts that per capita output is lower than it is without discrimination.

We find that the effects of gender discrimination are more serious in particular sectors of the economy, as we find the effects to be stronger if we only consider the tertiary sector. However, we do not find that higher ratios of female-to-male agricultural workers are related to higher agricultural per capita ouptut. This is in line with the model in this chapter in that distortions in the allocation of managerial talent play a larger role in sectors where higher skills are needed—as opposed to sectors that require more physical abilities, as agriculture. Therefore, these results can be matched to the model's predictions in the sense that while gender discrimination in the form of restricting women's access to work lowers output in all sectors, gender discrimination in managerial positions that distorts the allocation of talent between managerial and unskilled positions lowers output in sectors where managerial talent is relatively more important than physical comparative advantages.

The fact that we find a close matching of the empirical results to the theoretical predictions and that our results are robust to the inclusion of various controls for omitted variables and to potential endogeneity make us more confident that gender discrimination has a detrimental effect on economic development, and that this effect is large.

Moreover, our results also suggest that female labour participation will not necessarily increase with economic growth. In fact, it seems that richer states tend to have lower ratios of female-to-male labour participation, suggesting indeed the existence of a discriminatory social norm that is binding. This is also related to the theoretical section, where we also discuss how it is possible that gender discrimination, despite its harmful economic consequences, is a sustainable social norm. Therefore for economic development it is crucial to try and erode this discriminatory social norm by encouraging policies and education that underline the value of women in society and in particular in the labour market. We need to think about targeted policies that change social norms and society's perceptions of what women are capable of. In that sense, our understanding of what policies are effective in shifting deeply embedded cultural norms like gender discrimination is extremely limited. Nevertheless, there is a role for the government in financing projects like Mahila Samakhya, a women's empowerment project launched in 1986 by the Ministry of Human Resource Development which, through the building of village level collectives, seeks

to bring about a change in women's perception about themselves and that of society regarding women's traditional roles.

2.7 Appendix: Proofs of some results

Proof. [Proof of Proposition 1] The particular function for the cutoff level of talent is as follows:

$$T'(w) = \frac{w + w^{\frac{1}{1-\sigma}} a_p^{-\frac{1}{1-\sigma}} \hat{\sigma} + a_p \overline{H}_p}{c \overline{\alpha} \overline{H}_p s^{\frac{1}{\alpha}} w^{-\frac{1-\alpha}{\alpha}} + (1-c)^{\frac{1}{\beta}} s^{\frac{1}{\alpha\beta}} w^{-\frac{1-\alpha}{\alpha\beta}} a_h^{-\frac{1-\beta}{\beta}} \overline{\alpha}\beta(1-\beta)^{\frac{1-\beta}{\beta}}}.$$

All the important endogenous variables depend on the wage rate, w. After solving for the equilibrium wage rate, the remaining variables are endogenously determined. In particular, it can be checked that $\frac{\partial T'(w)}{\partial w} > 0$. ∎

Proof. [Proof of Proposition 2] Recall by (2.10) that $H_{p,w} \leq \overline{H}_p$, as long as $w \leq \frac{a_p \overline{H}_p^{1-\sigma}}{\sigma}$, because higher wages mean incentives for the worker to invest more in primary education. There are two possibilities:

In the first case, workers are in the range where $H_{p,w} < \overline{H}_p$. In this case, discrimination lowers the primary human capital of workers. Since some males are entrepreneurs, they will still go through the whole primary schooling process; as a result, the average primary education for males compared to females is

$$AH_p^{males} = \frac{NH_{p,w} + M\overline{H}_p}{P} > H_{p,w} = AH_p^{females},$$

where AH denotes average human capital and N denotes the number of workers. In this case, therefore, the ratio of female-to-male primary education decreases with partial discrimination.

The second possibility is that $H_{p,w} = \overline{H}_p$, which was also true before discrimination because wages were higher. In this case, gender discrimination does not reduce the human capital of workers. Moreover, workers and entrepreneurs, males and females, all go to primary school, so discrimination does not show up in the female-to-male ratio of primary education, but only in the ratio of higher education.

■

2.8 Data appendix

We use data from sixteen Indian states over the period 1961-1991. Our data base builds on Özler *et al* (1996) and Besley and Burgess (2002, 2004). In particular, state per capita **net domestic product** at current prices comes from *Estimates of State Domestic Product* [Department of Statistics, Department of Statistics, Ministry of Planning, Government of India]. **Education** (female and male literacy rates) and **population** (population growth, and the percentage of urban population to total population) measures come from *Education in India* [Ministry of Education, Government of India] and *Selected educational statistics* [Ministry of Education, Government of India] and from the *Census of India* (*General Economic Tables*, *Socio-Cultural Tables*). Both education and population measures correspond to census issues for 1961,

1971, 1981 and 1991, and have been interpolated between census years. Data on **capital** stock (productive capital) come from the *Annual Survey of Industries* [Central Statistical Office, Industrial Planning Wing, Department of Statistics, Ministry of Planning and Programme Implementation, Government of India]. Data on **politics**— political competition (the absolute difference between the percentage of seats occupied by the Congress party and its main competitor), election turnout (percentage of electors who voted), and information on election years, are calculated from figures in Butler *et al* (1995).

The quality of the judiciary (in particular high courts) is measured by **annual pendency rates**, where the pendency rate is constructed by Besley and Burgess (2004) by adding the number of cases pending at the beginning of the year to cases filed in the year and dividing this by cases resolved during the year.

The gender composition of the **labour force** figures come from the *Census of India* 1961, 1971, 1981 and 1991 (*General Economic Tables*), where we find data on four classes of worker: *employers*, *employees*, *single workers*, and *family workers*, which we interpolate between census years. We use the first category as it is and then define *total workers* as the sum of the four. There are however some changes of definitions in the census over the years, which are explained next. Also from the Census are the variables of employment by sector.

In the census issues of 1961 and 1971, the population was divided into either *workers* or *non-workers*. A *worker* is defined as "a person whose main activity was

participation in any economically productive work by his physical or mental activity". In the case of regular employment in any trade, profession, service, business or commerce, the criterion of work was satisfied if the person had been employed during any 15 days preceding the day on which he was enumerated. This is somewhat different in the census of 1971 since the reference period is a week.

In the census issues of 1981 and 1991, population is instead divided into *main workers*, *marginal workers*, *and non-workers*. A *main* (*marginal*) *worker* is defined as "a person whose main activity was participation in any economically productive work by his physical or mental activities and who had worked for 183 days or more (less than 183 days)". For the 1991 issue, we then use the sum of main and marginal workers, so that the same information as in census 1961 and 1971 is used. However, information on the class of worker is only available in the 1981 issue for main workers. Marginal workers typically reflect a very small percentage of total workers, so we do not expect this to affect results in a significant way.

Definitions of every class of worker are as follows. An *employer* is "a person who had necessarily to employ other persons in order to carry on the business from which he served his likelihood." In that sense, "if a person employed a cook or other person for domestic service, he was not to be recorded as employer merely for that reason." An *employee* is "a person who ordinarily worked under some other person for a salary or a wage in cash or in kind as a means of earning a likelihood." A *single worker* is "a person who is doing her/his job without employing others except

casually, and without the help of other members of the family except casually and a participant in work as member of co-operative." Finally, a *family worker* is "a person who is doing her/his work in a family enterprise along with the other members of the family without wages or salary in cash or kind."

To make sure it is not the interpolated data that generates our results, we run two respective basic regressions with only the non-interpolated employment data (see Tables 2.10 and 2.11).

Annual data on **maternity benefits,** in particular the number of complaints received under the Maternity Benefits Act (1961) and the respective number of prosecutions launched are taken from the *Indian Labour Year Book* [Labour Bureau, Ministry of Labour], years 1962-1992. Due to data availability, the data used in this study refer to women employees in factories only.

Women who work in factories, mines, plantations, performance establishments and shops with more than 10 employees and who have worked in an establishment for 80 days in the 12 months immediately preceding the day of her delivery are entitled to receiving maternity benefit. The Act establishes that payment consists of 12 weeks paid maternity leave, and 6 weeks paid leave in relation to miscarriage or termination of pregnancy. The maternity benefit consists of payment at the rate of average daily wage for the period of actual absence. In addition, a woman is entitled to prescribed medical bonus if no free-natal/post-natal care is provided by the employer.[113] The Act

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[113] India's First Report, Convention on the Elimination of all forms of Discrimination against Women (CEDAW).

does not apply to employees covered by the Employees' State Insurance Act (1948).

The administration of the Maternity Benefits Act in States is the responsibility of

the Factory Inspectorates, who are constituted by the appropriate State Governments

and are in charge of administering the Factories Act (1948). Factory Inspectorates

then appoint inspectors, who possess wide powers such as entry into the factory,

inspection of premises, plant and machinery, making on-the-spot enquiries, requiring

production of documents, etc., for effective enforcement of the acts (Indian Labour

Year Book 1963, Chapter 9, Labour Legislation).

The Maternity Benefits Act specifies the power of inspectors regarding direct

payments and complaints and prosecutions in section 17 (Government of India, Min-

istry of Law and Justice):

17. Power of Inspector to direct payments to be made:
(1) Any woman claiming that
(a) maternity benefit or any other amount to which she is entitled under this Act and any person claiming that payment due under section 7 has been improperly withheld;
(b) her employer has discharged or dismissed her during or on account of her absence from work in accordance with the provisions of this Act, may make a complaint to the Inspector.
(2) The Inspector may, of his own motion or on receipt of a complaint referred to in sub-section (1), make an inquiry or cause an inquiry to be made and if satisfied that
      (a) payment has been wrongfully withheld, may direct the payment to be made in accordance with his orders;
(b) she has been discharged or dismissed during or on account of her absence from work in accordance with the provisions of this Act, may pass such orders

as are just and proper according to the circumstances of the case.

Figure A1 Map of India's states

State	Female-to-male agricultural workers	Female-to-male other workers	Female-to-male managers	Female literacy rate	Male literacy rate	Net per capita real income
Andhra Pradesh	0.69	0.21	0.082	0.19	0.43	1004
	(0.09)	(0.04)	(0.02)	(0.04)	(0.04)	(260)
Assam	0.29	0.28	0.037	0.20	0.60	903
	(0.13)	(0.03)	(0.02)	(0.06)	(0.08)	(196)
Bihar	0.31	0.09	0.09	0.12	0.42	633
	(0.09)	(0.03)	(0.03)	(0.04)	(0.05)	(110)
Gujarat	0.49	0.13	0.023	0.30	0.60	1176
	(0.14)	(0.03)	(0.01)	(0.07)	(0.06)	(272)
Haryana	0.21	0.07	0.014	0.22	0.54	1444
	(0.08)	(0.01)	(0.01)	(0.05)	(0.07)	(357)
Jammu & Kashmir	0.35	0.06	0.016	0.10	0.31	1021
	(0.19)	(0.01)	(0.01)	(0.04)	(0.07)	(228)
Karnataka	0.64	0.22	0.053	0.25	0.54	1037
	(0.05)	(0.03)	(0.01)	(0.07)	(0.06)	(217)
Kerala	0.51	0.24	0.034	0.65	0.83	864
	(0.14)	(0.01)	(0.01)	(0.11)	(0.07)	(182)
Madhya Pradesh	0.62	0.12	0.044	0.14	0.44	843
	(0.12)	(0.07)	(0.01)	(0.05)	(0.07)	(190)
Maharashtra	0.80	0.14	0.046	0.31	0.64	1288
	(0.15)	(0.02)	(0.02)	(0.08)	(0.07)	(331)
Orissa	0.32	0.18	0.069	0.18	0.52	873
	(0.11)	(0.08)	(0.06)	(0.07)	(0.06)	(186)
Punjab	0.11	0.07	0.016	0.29	0.49	1732
	(0.08)	(0.01)	(0.01)	(0.09)	(0.07)	(384)
Rajasthan	0.47	0.11	0.033	0.11	0.39	786
	(0.17)	(0.03)	(0.01)	(0.03)	(0.08)	(137)
Tamil Nadu	0.57	0.19	0.036	0.30	0.62	1015
	(0.13)	(0.04)	(0.02)	(0.08)	(0.05)	(272)
Uttar Pradesh	0.17	0.07	0.027	0.13	0.42	874
	(0.04)	(0.02)	(0.01)	(0.04)	(0.07)	(141)
West Bengal	0.15	0.12	0.022	0.30	0.58	1173
	(0.04)	(0.01)	(0.01)	(0.07)	(0.06)	(191)
Number of observations	476	476	476	457	457	505

Note: standard deviation in parentheses.

Table 2.1: Descriptive statistics of main variables, Indian states, 1961-1991

State	Share of female agricultural workers	Share of female household workers	Share of female other workers	Share of male agricultural workers	Share of male household workers	Share of male other workers
Andhra Pradesh	82.0	5.57	11.7	63.5	5.32	31.1
	(1.92)	(1.37)	(1.40)	(1.11)	(2.02)	(2.59)
Assam	64.5	5.54	29.5	67.1	0.86	31.9
	(10.6)	(4.91)	(10.8)	(2.08)	(0.16)	(2.13)
Bihar	89.5	3.56	6.01	78.1	2.65	19.1
	(2.67)	(1.74)	(0.80)	(1.70)	(0.80)	(1.23)
Gujarat	81.7	3.37	12.1	58.5	2.99	38.4
	(0.37)	(1.90)	(1.38)	(3.66)	(1.28)	(4.65)
Haryana	81.3	1.89	15.6	60.5	2.57	36.8
	(5.35)	(0.72)	(5.07)	(2.74)	(0.54)	(3.25)
Jammu & Kashmir	84.1	7.71	7.95	67.7	4.06	28.2
	(5.52)	(3.57)	(4.49)	(3.83)	(0.24)	(3.57)
Karnataka	78.5	3.74	16.0	60.0	2.49	37.2
	(0.31)	(1.24)	(1.05)	(1.20)	(0.50)	(1.74)
Kerala	57.7	9.57	37.5	41.3	2.87	54.2
	(13.3)	(3.37)	(2.15)	(2.98)	(0.91)	(2.64)
Madhya Pradesh	89.1	3.82	6.49	73.1	3.56	23.3
	(0.63)	(0.40)	(0.64)	(1.94)	(0.83)	(5.15)
Maharashtra	85.9	2.65	10.9	54.5	2.97	42.2
	(0.80)	(0.64)	(1.02)	(3.43)	(0.87)	(4.02)
Orissa	78.8	7.03	12.8	75.0	3.32	21.5
	(5.76)	(2.13)	(4.69)	(1.99)	(0.79)	(2.29)
Punjab	41.9	7.08	43.9	54.6	3.16	32.9
	(4.58)	(2.16)	(21.6)	(6.52)	(1.94)	(3.45)
Rajasthan	88.6	3.03	7.42	69.2	3.67	27.0
	(2.17)	(1.55)	(1.82)	(3.05)	(1.17)	(3.97)
Tamil Nadu	73.3	5.40	16.6	55.3	3.75	40.6
	(1.91)	(0.26)	(1.54)	(1.78)	(0.46)	(2.16)
Uttar Pradesh	76.8	4.88	8.19	73.8	3.74	22.4
	(16.0)	(1.31)	(0.46)	(1.58)	(0.94)	(2.10)
West Bengal	58.3	8.99	30.2	55.6	2.85	41.2
	(1.15)	(1.92)	(4.14)	(1.68)	(0.15)	(1.53)
Number of observations	476	476	476	476	476	476

Note: standard deviation in parentheses.

Table 2.2: Descriptive statistics: female and male workers by sector

Dependent variable: log per capita non-agricultural output				
OLS	(1)	(2)	(3)	(4)
Female-to-male managers	1.38**	1.18**	1.49***	1.53***
	(0.60)	(0.53)	(0.47)	(0.51)
Female literacy rate	1.49**	1.47*	1.70**	1.59**
	(0.76)	(0.78)	(0.68)	(0.72)
Male literacy rate	-0.17	-0.17	-2.02	-1.95
	(1.67)	(1.65)	(1.41)	(1.36)
Population growth	-0.02	0.01	0.12	0.11
	(0.13)	(0.13)	(0.11)	(0.10)
Ratio of urban to total population	5.70	5.95	5.81**	6.15*
	(3.21)	(3.16)	(2.45)	(3.51)
Ratio of capital to labour	-29.8	-33.3	-73.3	-90.8
	(114)	(120)	(116)	(169)
Election dummy		-0.02	-0.01	-0.02
		(0.80)	(0.02)	(0.02)
Election turnout		-0.003**	-0.001	-0.002
		(0.002)	(0.002)	(0.002)
Political competition		0.001	0.003	0.001
		(0.001)	(0.003)	(0.001)
Scheduled tribes and castes population (%)			-0.02**	-0.02***
			(0.09)	(0.01)
Log non-agricultural work force			0.33**	0.31**
			(0.16)	(0.15)
Muslim population (%)				-0.02
				(0.05)
Hindu population (%)				-0.02
				(0.04)
State effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Number of observations	289	288	288	270

Notes: robust standard errors clustered at the state level in parentheses.

*significant at 10%; **significant at 5%; ***significant at 1%.

Table 2.3: Non-agricultural output and gender composition of the labour force, by class - Managers

Dependent variable: log per capita non-agricultural output				
OLS	(1)	(2)	(3)	(4)
Female-to-male workers	2.54***	2.40***	2.90***	3.20***
	(0.38)	(0.34)	(0.32)	(0.35)
Female literacy rate	1.76**	1.73**	1.21*	1.29*
	(0.68)	(0.72)	(0.73)	(0.74)
Male literacy rate	0.30	0.23	-1.49	-1.27
	(1.71)	(1.67)	(1.17)	(1.09)
Population growth	-0.02	0.02	0.22*	0.19
	(0.13)	(0.13)	(0.12)	(0.11)
Ratio of urban to total population	3.78	4.29	4.83*	5.49*
	(3.12)	(3.09)	(2.62)	(3.18)
Ratio of capital to labour	-19.5	-25.1	-156	-158
	(100)	(109)	(113)	(159)
Election dummy		-0.01	-0.01	-0.01
		(0.02)	(0.02)	(0.02)
Election turnout		-0.003***	-0.002	-0.002
		(0.001)	(0.002)	(0.002)
Political competition		0.001	0.003	0.001
		(0.001)	(0.003)	(0.001)
Scheduled tribes and castes population (%)			-0.02**	-0.02***
			(0.09)	(0.01)
Log non-agricultural work force			0.33**	0.31**
			(0.16)	(0.15)
Muslim populaiton (%)				-0.02
				(0.05)
Hindu population (%)				-0.02
				(0.04)
State effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Number of observations	289	288	288	270

Notes: robust standard errors clustered at the state level in parentheses.

*significant at 10%; **significant at 5%; ***significant at 1%.

Table 2.4: Non-agricultural output and gender composition of the labour force, by class - Workers

Dependent variable: log per capita output by sector				
OLS	(1)	(2)	(3)	(4)
Female-to-male agricultural workers	0.39			
	(0.35)			
Female-to-male household workers		0.12***		
		(0.04)		
Female-to-male secondary sector workers			-0.37	
			(0.57)	
Female-to-male tertiary sector workers				1.61***
				(0.29)
Political controls	yes	yes	yes	yes
Socioeconomic controls	yes	yes	yes	yes
State effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Number of observations	261	261	258	257

Notes: robust standard errors clustered at the state level in parentheses.

*significant at 10%; **significant at 5%; ***significant at 1%.

Table 2.5: Non-agricultural output and gender composition of the labour force, by class - Workers

Dependent variable: log per capita output, tertiary sector		
OLS	(1)	(2)
Female-to-male employers	2.90***	
	(0.47)	
Female-to-male workers		1.42***
		(0.50)
Political controls	yes	yes
Socioeconomic controls	yes	yes
State effects	yes	yes
Year effects	yes	yes
Number of observations	257	257

Notes: robust standard errors clustered at the state level in parentheses. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 2.6: Output and gender composition of the labour force, tertiary sector

Dependent variable: ratio of prosecutions launched to complaints received					
OLS	(1)	(2)	(3)	(4)	(5)
Log real output per capita	22.3				
	(24.9)				
Log real output per capita, tertiary sector only		-4.91			
		(9.82)			
Annual pendency rates at high courts			4.43		
			(7.51)		
Expenditure on organs of the state				-0.0005	
				(0.001)	
Expenditure on administration services of the state					1.08
					(1.06)
State effects	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes
Adjusted R^2	0.28	0.35	0.30	0.30	0.29
Number of observations	421	421	319	270	384

Notes: robust standard errors clustered at the state level in parentheses.

*significant at 10%; **significant at 5%; ***significant at 1%.

Table 2.7: Exogeneity of Maternity Benefits Act (1961) instrument

	Dependent variable			
	(1)	(2)	(3)	(4)
	Log non-agricultural output	Log non-agricultural output	Female-to-male managers	Female-to-male workers
Female-to-male managers	4.30***			
	(1.55)			
Female-to-male workers		4.14***		
		(2.02)		
Socioeconomic controls	yes	yes	yes	yes
Political controls	yes	yes	yes	yes
State effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Ratio of prosecutions launched to complaints received			0.00003**	0.00003*
			(0.00001)	(0.00002)
Adjusted/Centered R^2	0.99	0.99	0.67	0.92
Number of observations	244	244	244	244

Notes: robust standard errors clustered at the state level in parentheses.*significant at 10%; **significant at 5%;

***significant at 1%. Socioeconomic controls are female and male literacy rates, population growth, the ratio of urban to total population, and the ratio of capital to labour. Political controls are the absolute difference between the percentage of seats of the Congress party and its main competitor, lagged election turnout, and a dummy for

an election year. The ratio of female-to-male managers/workers are instrumented with the ratio of prosecutions launched to the number of complaints received from factories under the Maternity Benefits Act (1961).

Table 2.8: Non-agricultural output and instrumented gender composition of the labour force, by class

	Dependent variable			
	(1)	(2)	(3)	(4)
	Log output tertiary sector	Log output tertiary sector	Female-to-male managers	Female-to-male workers
Female-to-male managers	5.69***			
	(2.30)			
Female-to-male workers		5.47**		
		(2.70)		
Socioeconomic controls	yes	yes	yes	yes
Political controls	yes	yes	yes	yes
State effects	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Ratio of prosecutions launched to complaints received			0.00003**	0.00003*
			(0.00001)	(0.00002)
Adjusted/Centered R^2	0.93	0.91	0.67	0.93
Number of observations	242	242	242	242

Notes: robust standard errors clustered at the state level in parentheses.*significant at 10%; **significant at 5%; ***significant at 1%. Socioeconomic controls are female and male literacy rates, population growth, the ratio of urban to total population, and the ratio of capital to labour. Political controls are the absolute difference between the percentage of seats of the Congress party and its main competitor, lagged election turnout, and a dummy for an election year. The ratio of female-to-male managers/workers are instrumented with the ratio of prosecutions launched to the number of complaints received from factories under the Maternity Benefits Act (1961).

Table 2.9: Tertiary sector output and instrumented gender composition of the labour force, by class

Dependent variable: log per capita non-agricultural output				
	Fixed Effects		Fixed Effects IV	
Female-to-male managers	2.65***		5.11	
	(0.85)		(3.46)	
Female-to-male workers		1.22***		1.31***
		(0.36)		(0.61)
Number of observations	59	59	51	51

Notes: robust standard errors clustered at the state level in parentheses.*significant at 10%;**significant at 5%;***significant at 1%
A constant term, state fixed-effects and a year trend are included in all regressions. The corresponding regressor is instrumented with the number of prosecutions launched relative to the number of complaints under the Maternity Benefits Act (1961).

Table 2.10: Non-agricultural output and gender composition of the labour force, by class - Non-interpolated data

Dependent variable: log per capita tertiary sector output				
	Fixed Effects		Fixed Effects IV	
Female-to-male managers	3.18**		8.18*	
	(1.31)		(4.79)	
Female-to-male workers		1.21***		2.11***
		(0.47)		(0.84)
Number of observations	59	59	50	50

Notes: robust standard errors clustered at the state level in paren-
theses.*significant at 10%;**significant at 5%;***significant at 1%
A constant term, state fixed-effects and a year trend are included
in all regressions. The corresponding regressor is instrumented
with the number of prosecutions launched relative to the number
of complaints under the Maternity Benefits Act (1961).

Table 2.11: Tertiary sector output and gender composition of the labour force, by class - Non-interpolated data

Chapter 3
Will Gender Parity Break the Glass Ceiling? Evidence from a Randomised Experiment

joint with Manuel F. Bagüés

3.1 Introduction

Legislation and policy encouraging gender parity, or gender quotas, in top political or public positions has recently been approved in some countries and is being considered in many others. In Chile, Michelle Bachelet has just appointed 50% of women to her cabinet. In Norway, since 1988 there must be a minimum of 40% of each gender in publicly appointed committees, boards, and councils. Furthermore, since January 2005, Norwegian state-owned enterprises are required to have at least 40% board representation of each gender. In 2004 the newly elected Spanish Prime Minister, Socialist José Luis Zapatero, appointed 50% of women to his cabinet, and announced that "there will be gender parity in all selection committees in the state administration, public organisations and related firms".[114] Private corporations in Spain

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[114] See the Official State Bulletin (BOE) number 57, March 8th 2005, page 8111. See, as well, the *IV Plan de Igualdad de Oportunidades entre Mujeres y Hombres, 2003-2006* (Ministry of Social Affairs, Spain).

are also receiving governmental guidelines towards greater participation of women at boards.[115]

The reason for imposing gender parity in top positions lies in the extremely low percentages of women in decision-making posts, at both the public and private sectors. In political positions, only in 12 out of 179 countries women accounted for at least 30% of parliamentary seats in 2003.[116] In Italy and France, only 3% and 4% respectively of the 50 largest companies' board directors are women.[117] In the US, women constituted only 3.4% of the top level management in a sample of firms in 1997 (Bertrand and Hallock 1999).

In the past, policy towards gender equality in the professional and public spheres seemed to focus on the so-called *equal opportunities* approach.[118] Underlying this approach was the pipeline theory, according to which women are moving their way through the pipeline and into top level jobs. In that context, an increased ratio of female students would lead, more or less automatically, to an increase of women further up in the system. Accordingly, policy was designed to encourage women's

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[115] The guidelines are as follows: (1) Board members are encouraged to clarify why there might be no women at the board, and any measures taken. (2) Whenever there are any vacancies, the board is encouraged to ensure that the selection process is not biased against females. The board should also intently look for women who have the desired professional profile. (3) Firms are encouraged to include a discussion of the gender distribution of positions and report any changes. The report also points out that, due to 'old boys' network effects and hysteresis, this sort of policy is necessary in order to increase the low percentages of women at boards (*Proyecto de Código Unificado de Recomendaciones de Buen Gobierno de Sociedades Cotizadas*, January 2006).

[116] Sweden leads the list with 45% (UN Millennium indicators).

[117] According to a report from the Aspen Institute Italia (The Economist).

[118] In the US and other countries there has also existed affirmative action policy, involving quotas but generally not at the 50-50 level (Fryer and Loury 2005).

higher education and skills on the understanding that providing women with the same human capital as men would enable them to reach the top positions they seemed unable to attain.[119] The evidence for the pipeline theory is disappointing: in Norway, despite significant increases in the female ratio among students in higher education (25% in 1960, 33% in 1970, and about 50% since 1986), only two out of ten professors are women.[120] In the same vein, there is a prevailing view that women have started to move up into management and public positions, but once they reach a certain point, the so-called 'glass celing', they do not seem to go any further. Whatever the reason behind the existence of a glass ceiling, pessimism about the pipeline theory might explain the more recent approach, that of *equal results*: the imposition of gender parity in outcomes, such as cabinet, or board membership. The shift in policy is obvious in the Spanish case. In a recent governmental document on proposals towards gender equality, equality of opportunity is mentioned only once, while gender parity appears in the document six times.[121] Underlying this shift in policy lies the recognition that the equal opportunities approach has not created the desired move towards gender equality. Thus, the motivation for imposing gender parity seems to be the rationale that once more women are in top positions in the public sphere, it

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[119] This approach is still in use and sometimes in connection with gender parity, e.g. the French Parliament passed legislation in 2001 mandating gender parity in party lists for a variety of elections (see Frechette *et al* 2005 for an analysis of the political economy of gender quotas).

[120] Rogg (2003).

[121] ORDEN PRE/525/2005, March 7 (*BOE, March 8, 2005*).

should be easier for other women to get to that level—in other words, gender parity in decision-making could break the glass ceiling.[122]

Nevertheless, it is not clear that imposing gender parity in top positions is going to increase the numbers of women in other high positions. Indeed, although implicit in many discussions of gender parity policy, there is no clear evidence for the hypothesis that the lack of women in top positions is due to men discriminating against women.

Indeed, there is empirical evidence that suggests that gender can matter: Goldin and Rouse (2000) find that the adoption of a screen in the orchestras' hiring process of musicians fostered impartiality in hiring and increased the proportion of women hired, Lavy (2004) compares data on blind and non-blind scores that high school students receive on matriculation exams in their senior year in Israel, and finds gender discrimination against *male* students in each subject. Blank (1991) compares single-blind and double-blind reviewing of papers submitted to *The American Economic Review* and finds a small, insignificant effect, in that female authors fare better under double-blind reviewing.

Now, there are several explanations consistent with the low numbers of women in top level positions we observe in reality. First, there could exist taste discrimi-

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[122] Gender quotas are often imposed on either of the following two stages of the selection process: the stage of finding aspirants, e.g. those willingly to be considered for nomination, or the stage of nominating the actual candidates (e.g. to be placed on the ballot by the party). In some cases, gender quotas are imposed on a third stage, the already selected or elected candidates. Here we implicitly consider gender quotas at a different stage, the *candidate evaluation* stage, but our evidence could also apply to the other quotas.

nation, i.e. discrimination *à la* Becker,[123] where women do not get to the top be-

cause men in top positions do not hire them since that would entail a utility loss for

them. Related would be the possible existence of 'old boys' network effects: the tra-

ditionally overwhelming presence of men in top positions in management and the

public sphere might make it more difficult for women to get to that level.[124] Second,

women could be, in average, less productive than men—that would generate statis-

tical discrimination in which women are not hired because they are identified with

the average woman.[125] For instance, Lazear and Rosen (1990) describe how statisti-

cal discrimination in the promotion process makes it difficult for women to progress

up the job ladders—such discrimination would be rational and operates on the be-

lief that women are more likely to withdraw from labour market activities than men.

Gneezy *et al* (2003) find that women perform worse when the environment (here, the

labour market) is competitive. The story in that paper, as well as Goldin and Rouse

(2003), is consistent with statistical discrimination. Third, women could not be get-

ting into decision-making positions because of other reasons, such as parental role

transmission (both female and male), identity issues (Akerlof and Kranton 2000),[126]

women's lower confidence (Bengtsson *et al* 2004) or, more generally, social norms.

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[123] Becker (1971).

[124] Bertrand and Hallock (1999) find some evidence against the 'old boys' network hypothesis in the US. They fail to find gender discrimination once they control for individual characteristics such as experience.

[125] Phelps (1972).

[126] Their model is consistent with empirical evidence that women who work more outside the home also work more inside the home. This evidence goes against Becker's (1965) theory of comparative advantage in gender roles (Akerlof and Kranton 2000, using data from the US for 1983-1992) .

The focus of this paper is the effectiveness of the gender parity approach: does increasing the number of women in top positions lead to recruiting of more women? The answer to this question gives us information regarding the three theoretical possibilities above. Indeed, imposing gender parity will only increase the number of women in top positions if the reason for the low incidence of women is taste discrimination by men. In the case that discrimination is statistical in the sense of e.g. Lazear and Rosen (1990), gender parity will not be effective. In the case that the low numbers of women are due to social norms, gender parity could work only if in connection with a major cultural change as, for example, the women's liberation movement in the late 1960s and early 1970s in the United States.

What are the ways in which gender parity could actually increase the number of women in top level positions? There are both direct and indirect potential ways. First, women who get to top level positions because of gender parity or quotas could hire more women than their (male) predecessors. Second, those women could become role models—if women are not getting to top positions because of social norms, having more women at the top might help change the social norm. Third, those women can affect choices in ways that might help other women to get to top positions. On the one hand, with choices that are more compatible with maternity, such as flexible working hours, and on the other hand, with policy choices such as public expenditure that benefit women more (Duflo and Chattopadhyay 2004). In this paper,

we can only focus on the first, direct effect.
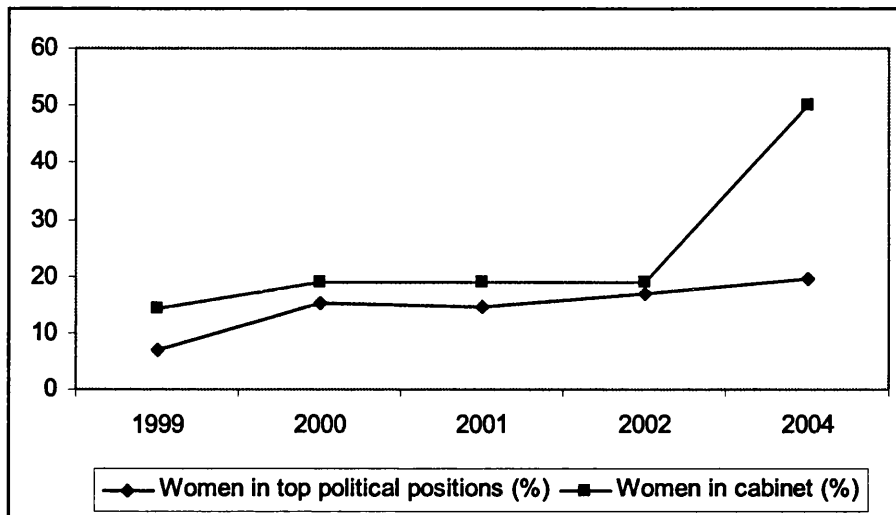
Figure 3.1 Women into political positions and cabinet members, Spain,1999-2004

Is gender parity actually effective in raising the numbers of women in other positions? In Spain, the cabinet gender parity that was imposed by the Socialist party in 2004 (from 18.75% women in cabinet in 2002) has not been followed by higher numbers of women in other top public positions.[127] That is, newly appointed female ministers have not hired more women than their (mostly male) predecessors.[128] Figure 3.1 plots women in top political positions including deputy secretaries and under secretaries.[129]

A related issue arises from the heterogeneity of women and representation. Since women do not constitute a homogeneous group, the effect of imposing gender

[127] With 19.6% of women in 2004 compared to 16.8% in 2002 with the then ruling Popular party, an increase that is consistent with previous years.

[128] We thank Florentino Felgueroso for pointing out this fact.

[129] Source: Instituto de la Mujer, http://www.mtas.es/mujer/mujeres/cifras/tablas/W98.XLS

quotas might generate different effects. For instance, in less developed countries, female leaders have typically been widows or daughters of deceased male leaders (e.g. Indira Gandhi, Benazir Bhutto). If women who have easier access to politics (or public office skills) disproportionally share the same background, a gender quota will create female policy-makers with little in common with the majority of women.

A neat empirical analysis of the effects of gender parity is hard to come by, because of the endogeneity encountered: in most real life cases the composition of evaluating or hiring committees is likely to be related to the characteristics of the candidates. That is, usually one cannot rule out the possibility that the number of female members in a committee may be somehow related to the average quality of females in that field. In order to avoid this problem, ideally we want to observe how committees of different characteristics evaluate the quality of candidates that have been randomly allocated.

This paper provides evidence from such an experiment. Here, we show that greater numbers of women in decision-making positions do not necessarily imply that women will have it easier to get into the elite, or decision-making positions. In fact, we find that committees where the proportion of women is greater actually make it more difficult for women candidates than for men candidates. In order to show this, we have exploited the exceptional evidence provided by the particular mechanism that is applied in Spain to select members for the public sector.[130] In Spain,

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[130] For an economics study of public exams in Spain see Bagüés (2005), who finds that the probability to pass a public exam is largely affected by randomness, nepotism and localism.

individuals who want to have access to any public official positions are required to pass a specific public exam at the national level. These public exams, which are also common in other countries of Southern Europe and Latin America, typically involve an extremely large number of candidates.[131] For instance, about 5,000 candidates apply for a judge position every year. Such numbers require the creation of several evaluation committees. Each candidate is then allocated to evaluation committees according to a lottery, so that the process whereby candidates and committees are mapped is based on a first random draw and, most crucially, it is completely orthogonal to gender. Committees are mostly composed by top public officers, but also other professionals in the field.[132]

Thus, the beauty of this evaluation process is (1) that candidates are allocated to committees randomly, which automatically eliminates concerns about omitted characteristics of candidates and other issues; (2) that the subjects and the experiment are actually taken from real life, with real-life payoffs, hence avoiding the usual *caveats* of experimental work; and (3) that the experiment is relevant because of the importance, and magnitude, of public exams.

In this paper we use information on 75,000 public exam candidates over 1995-2004 from a number of public exams to the Judicial Corps (namely exams to pass in order to become judge, prosecutor, and court secretary) in order to explore the rela-

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[131] In 2003, approximately 175,000 individuals including, of whom 131,000 were university graduates, were preparing for public exams in Spain ("Encuesta de Población Activa").

[132] For instance, in judge exams, committees are composed by seven members of the Judicial Corps but also two non members, namely one lawyer, and one law university professor.

tionship between the gender composition of the evaluating committees and the probability of success of candidates by gender. Using data over the period 1995-2004, we find that whenever evaluated by committees with more male (female) members, more (fewer) female candidates tend to succeed. We find that a female candidate's chances of passing the exam are 5.5% greater if she is evaluated by a committee with more male committee members than the median committee, than if she is evaluated by a committee with fewer male committee members than the median. Moreover, as we show in the empirical anaylsis, these differences are statistically significant.

This result is consistent with two hypotheses: (1) male committe members are more generous with female candidates, and (2) female committe members are more strict with female candidates. The empirical analysis we perform for years 2003 and 2004, years for which information from a multiple choice test is available, suggests that there is a bit of truth for each hypothesis. Due to the small sample size in this analysis though, this is not statistically significant. Regardless of whether it is (1) or (2) that constitutes the true reason behind this finding, this evidence suggests that gender parity will not increase the numbers of women making it to the elite. In fact, in the case of the Judicial Corps, imposing gender parity in the committees will reduce the number of female members. In our numbers, having more men in the committees would have increased the number of successful women in 3.5%, 1271 women would have been hired instead of 1230.[133]

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[133] These numbers have been calculated with respect to the median committee.

The evidence in this paper has great relevance for various reasons. First, the Spanish government and maximum judicial authority are considering imposing gender parity in all public recruiting committees, including the committees we study here. Importantly, it is possible that the evidence here can be extrapolated to similar committee systems in other sectors. In fact, Spain shares many features with the sort of countries where gender parity is considered.

Second, successful candidates to public exams become figures who deliver relevant decisions to society.[134] Indeed, many political figures in Spain belonged to the Judicial Corps before landing important posts in the government. Therefore, according to the results in this paper, the gender composition of the evaluating committees has an important effect on the gender composition of the elite. For this reason, this experiment constitutes an example of a randomised design that operates in a very important framework: the elite formation of society.

Finally, recent literature shows that the composition of the government is not irrelevant to policy choices, suggesting that women might have different preferences on public expenditure than men (Pande 2003, Duflo and Chattopadhyay 2004). All in all, and whatever the reason behind the effect found in this paper, imposing gender parity in public exam committees for the Judicial Corps would not increase, but rather

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[134] This is especially important in light of the evidence consistent with the view that judicial resolutions are not gender neutral. Indeed, even though the empirical evidence is not perfectly exogenous, male judges seem to be more favourable towards female defendants (see e.g. Nagel and Hagan 1983, Parisi 1982).

reduce, the number of women in the elite, and in turn, the government. Furthermore, this would later on translate into policy choices.

The organisation of the paper is as follows. Next, we discuss some background information about public exams in Spain. Section 3 describes the data. In Section 4 we perform the empirical analysis. In Section 5 we turn to a discussion of possibilities that are consistent with our finding. Finally, Section 6 concludes.

3.2 Background information: public examinations in Spain

We analyse four types of Spanish public exams: exams to become (1) judge, (2) prosecutor, (3) court secretary, and (4) a joint exam to become either judge or prosecutor that has been in place since 2001 (the judge and prosecutor exams were separate until 2000).[135]

Candidates to becoming members of the Judicial Corps must have a first degree in law. Every year, once the number of candidates is known, evaluating committees are formed. The committees are formed within a month of the publication of the candidates' names in the BOE (Official State Bulletin), and their composition is published in the BOE as well. No committee member is in two committees. In general, an evaluating committee is formed for every 500 candidates. Candidates are ranked in alphabetical order and committees are ranked numerically. Then a lottery decides

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[135] We cannot use data from the court secretary exam in 1997 because the exam outcome was not published in the BOE.

the initial according to which the alphabetical list of candidates will be matched with the list of evaluating committees. For instance, in January 2004, the letter that was randomly chosen was "S", hence the first candidate in the list whose initial was "S" was matched to the first committee in the list, and so on. Thus, the process whereby candidates and committees are mapped is based on a first random draw and, most crucially, it is completely orthogonal to gender.

The rules and composition of evaluating committees differ by exam, but the committees are generally composed by both members of the Judicial Corps and non members (law professors or lawyers).[136] Each committee is presided over by one member, who appoints the other members according to the rules.

Each committee evaluates a set of students, usually orally.[137] The topics that candidates are evaluated on are drawn from the set of possible topics, which are listed in the BOE beforehand. The exam lottery consists of balls numbered after the topics in the exam. Five balls are drawn, determining a particular five-question exam. A candidate receives an evaluation if he manages to answer the questions—many candidates fail to get an evaluation for this reason. The grading system of exams is as follows. At the end of each session, candidates are evaluated by committee members' ballots containing the grade for the candidate.[138] The grade ranges between zero and five per topic. For each candidate, the minimum and the maximum grade ballots are

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[136] For details, see the appendix.

[137] Except for the judge and prosecutor exam for which a preliminary eliminatory multiple choice test was used up to 1997, and was re-introduced in 2003.

[138] However, unofficial information confirms this is only used for unclear cases.

excluded. For the rest of the ballots, grades are added and divided by the number of

ballots, which determines each test's mark. Candidates who do not achieve at least

half the maximum grade in each test are disqualified. Candidates who do not achieve

at least more than half the maximum grade in three of the five topics in each test

are disqualified too. Candidates' final grades are obtained by adding their grade in

each test. The committee's decision is made on a majority basis. In case of a tie, the

president decides the final outcome.

3.3 Description of the data

The data we use here have been compiled from Spanish official publications (BOE,

selected issues) for public exams between 1995 and 2004. Our data base contains

information on about 20 exams in which nearly 75,000 candidates were evaluated

by 150 committees.[139] We investigate the relationship between gender composition

of committees and candidates' success by gender using two types of data on public

exams.

First, we use committee level data on the link between gender composition of

committees and the gender of candidates. We have data on committees for exams

over the period 1995 to 2004. In particular, we use data on 150 committees, for

which we know members' characteristics. Usually the composition of committees

that is first announced is somewhat different from the composition of committees

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[139] The set of candidates is not different from one year to another; some of them apply repeatedly.

that finally get to evaluate candidates,[140] so we use the data that correspond to the final committee composition. We do not observe the gender of all candidates, but we do observe the gender of successful candidates.

Second, we take advantage of a multiple choice test that was introduced in 2003 for the judge and prosecutor exam. Since then, the exam has consisted of three stages, all of them qualifying; the first one is a multiple choice test, the other two are two oral tests. For this, we have individual data on the 2003 and 2004 exams from over 4,000 candidates each year.

Next we discuss some descriptive statistics.

In Table 3.1 we show information from candidates. There are typically more female than male candidates (almost 70% for most exams). We do not have information on the total number of candidates by gender for previous years; we do though have data on the gender of successful candidates. Candidates from the capital represent about a fifth of all candidates; more than Andalusia, the most populated region in Spain, and about twice as much as Catalonia. We have also collected some information on candidate 'experience', in the sense of the number of times candidates take the public exam. Since we have the complete names and ID number of candidates we can track them over time. However, this procedure is limited to the number of years we have information for each public exam. For example, in Table 3.1 we use information from Bagüés (2005) using the numbers for the 2005 judge and pros-

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[140] Reasons are varied, but some individuals initially appointed as committee members have other important commitments or may have moved for job reasons.

ecutor exam. Out of the candidates who took that exam, at least 82.3% had taken the exam once before (i.e., 2004). Similarly, 65.7% of candidates had taken the exam twice before, 48.7% had taken the exam three times before, and 23.3% had taken it five times before (i.e. 2000, 2001, 2002, 2003, and 2004). That is, almost a fourth of all candidates to the judge and prosecutor exam in 2005 had already taken the exam at least five times before, which goes to demonstrate the exam difficulty and candidate perseverance.

Table 3.2 displays committee composition by type of exam, and the number of observations that are available for them respectively. As seen from the table, each committee has to be formed by Judicial Corps members (judges, prosecutors, court secretaries, and public defenders) and non members (law professors and lawyers). Members of the Judicial Corps cannot make more than half the committee (*Ley Orgánica 6/1985, July 1*). The rules for committee composition and formation are described in more detail in the appendix.

In Figure 3.2, we plot the percentage of women in committees, by year, and type of exam. Typically there are more men than women in committees; in the average committee women outnumber men only in the court secretary exams in 1998 and 2002 (about 57% were women). For the other types of exams, the average percentage

of women is between 20 and 30%.[141]
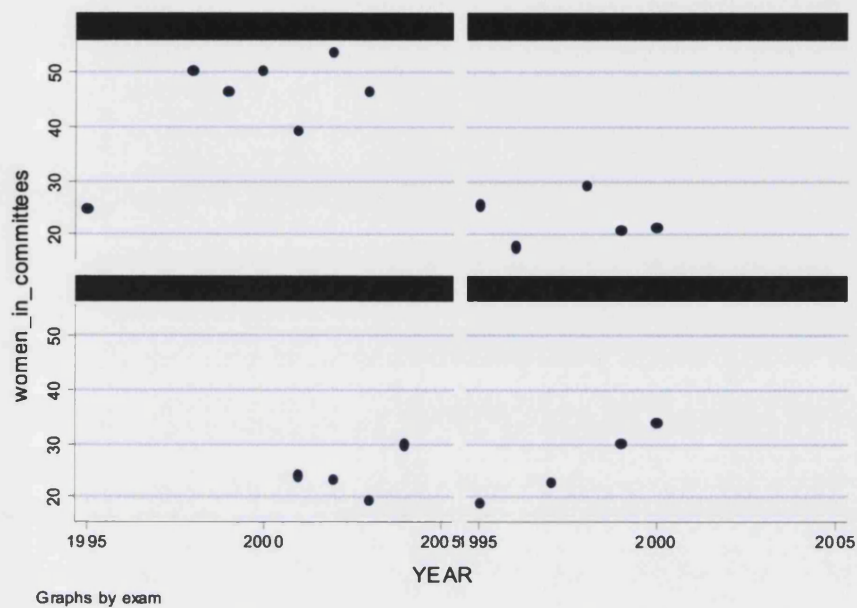
Figure 3.2 Women in committees (%), by type of exam: Court Secretary (top left),

Judge (top right), Judge and Prosecutor (bottom left), Prosecutor (bottom right).

Table 3.3 presents some descriptive statistics on committee members' charac-

teristics by gender. In general, female committee members are younger and have a

lower relative rank than their male counterparts.

Now we compare the characteristics of committees to the characteristics of

the total Judicial Corps population. We want to see if the incidence of women in

committees for public exams is different than their incidence in the whole judicial

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[141] Since 2001, the judge and prosecutor exams have been unified in one common exam. The corre-
sponding number of committees for each type of exam is: 50 (judge), 26 (prosecutor), 33 (judge and
prosecutor), and 31 (court secretary).

population, or whether it is representative of this population. Figure 3 shows the percentage of women judges, prosecutors, and court secretaries, who were in judicial public exam committees over 1995-2004.[142] We also have data on 1995, 2000, 2002 and 2004 for the percentage of women in judges, prosecutors, and court secretaries in Spain. In the graph, the percentage for judges in the population and committees are very similar; this is also true for court secretaries except for 2002. The prosecutor series seems more distinct: males are overrepresented in committees.

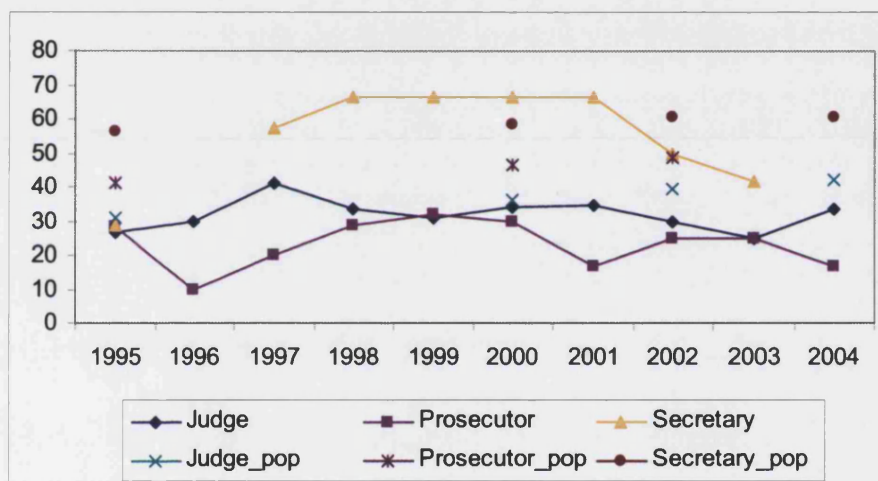**Figure 3.3** Women in population and in committees (%), by profession

3.4 Empirical evidence

In this section our goal is to estimate whether the gender composition of committees affects candidates' success according to their gender. Ideally, we would like to ob-

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[142] These data exclude the committee presidents who must belong to Superior Courts of Justice and therefore correspond to a different figure.

serve the individual vote of each committee member. However, we cannot do that, because only the committees' final aggregate decision is publicly available.

Given this limitation, our empirical strategy is twofold. In our first empirical strategy, we exploit committee composition and exam outcome for exams over the period 1995 to 2004. We use the female share in the committee as measure of the gender composition of the committee. For this, we have data on 150 committees (who evaluated about 75,000 candidates). Since, as described in the previous section, the allocation of candidates to committees is orthogonal to gender, we also know that the proportion of women evaluated by every committee is statistically similar.

We analyse the relationship between the gender composition of an evaluating committee and the candidate's probability to succeed by gender. We do this by looking at regressions of the form:

$$y_{cet} = \beta s_{cet} + \alpha_{et} + \varepsilon_{cet} \tag{3.1}$$

where y denotes a measure of successful candidates (e.g., female successful candidates, or male candidates), s denotes the share of women in the committee, e denotes type of exam (judge, prosecutor, court secretary, or judge and prosecutor together), t denotes year, c denotes committee, α_{et} and is an exam and year fixed effect.

In each committee the number of positions is more or less fixed,[143] therefore we cluster standard errors at the exam level.

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[143] See appendix for details.

In Table 3.4 we present results from running regression (1) using the number of female successful candidates as dependent variable in the left panel, and the number of male successful candidates as dependent variable in the right panel.[144]

In column (1), pooling all committee members (regardless of their membership to the Judicial Corps), the share of women in the committee shows a negative, not significant effect on the number of sucessful female candidates; in column (4) the effect is positive, and significant, for the number of male successful candidates.

In columns (2) and (5) we distinguish between members in the committee who belong to the Judicial Corps and those do not. In column (2), the share of female Judicial Corps members is strongly negatively related with the number of women who pass the exam (significant at the 1 percent level). In column (5), we observe a positive effect on the number of successful men; this is significant at the 5 percent level. The effect for non members is not statistical significant. This is consistent with the fact that, in reality, it is only the members of the Judicial Corps (and especially the president) who are relevant to the decision.

In sum, we find that the gender composition of the committee matters. Now we want to look at information about committees in order to try and learn more about this effect. For this, we run

$$y_{cet} = \beta s_{cet} + \delta X_{cet} + \alpha_{et} + \varepsilon_{cet} \tag{3.2}$$

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[144] Since the first committee in each exam might have a different number of positions, we are also including a dummy variable that equals one for the first committee.

where X is a set of committee characteristics. We also disaggregate Judicial Corps members between the president and the rest of Judicial Corps members.

In columns (3) and (6) we also introduce the mean age of Judicial Corps members of the committee (and a quadratic term), their mean age of entry into the Judicial Corps, and their mean ranking.[145]

In column (3), the female share of Judicial members in the committee is still significantly negatively related with the number of successful women. The gender of the president also has a negative effect, but it is not significant. Ranking is the only committee characteristic that matters: more highly ranked members are related to more women succeeding (at the 10 percent level). In column (6), while the female share in Judicial committee members does not have a significant effect for members other than the president, more male candidates are successful if the committee president is a woman. In the case of successful men, we do find that age is important, if only marginally. The effect is nonlinear: more men pass the exam when evaluated by older committees, up to age 50; from then on, older committee members are associated with more women passing the exam. That is, the fact that generally male committee members are older does not explain the gender effect we find—in fact, older committee members then to be associated with more male successful candidates (there is no effect on females as seen in column (3)).

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[145] The ranking is a measure of both quality and seniority.

In Table 3.5 we run regression (3.1), this time with the total number of candidates who pass the exam (left panel), and the percentage of female candidates that pass the exam (right panel).

In columns (1) to (3), none of the variables seem to affect the total number of successful candidates. The reason for looking into this is that whenever some committees do not fill all positions, other committees could potentially use those vacancies if there are more satisfactory candidates than available positions.[146] The results suggest that this is not important for the gender composition of the committee.

In columns (4) to (6) we show results using the percentage of successful women. Even though these results should be taken with some caution in statistical terms, they constitute a good summary of results in Table 3.4. Looking at column (4), the female share of committees is related with a lower percentage of women passing the exam at the 10 percent level—regardless of whether the committee members are Judicial Corps members or not. In column (5), the share of female Judicial Corps members lowers the percentage, the effect seems to come from the president but also the other members. As in Table 3.5, we also find a significant nonlinear age effect, which works in the same direction as previously.[147]

In Figure 3.4 we show graphically the results. We classify committees with respect to the median committe's gender composition, that is we classify committees

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[146] See appendix.

[147] The age of entry of the president, and the age of the president, do not have any effect in regression (1). They are not included in tables 4 and 5 because there are some missing observations in those series.

into those where the percentage of women is lower than the median (52), and those where it is higher (58). The average percentage of female successful candidates is higher for the former, and the difference is significant at the 5 percent level.

Taken together, the results from Tables 3.4 and 3.5 are clear: female (male) candidates are more likely to be successful when evaluated by committees in which there are more women (men).[148]
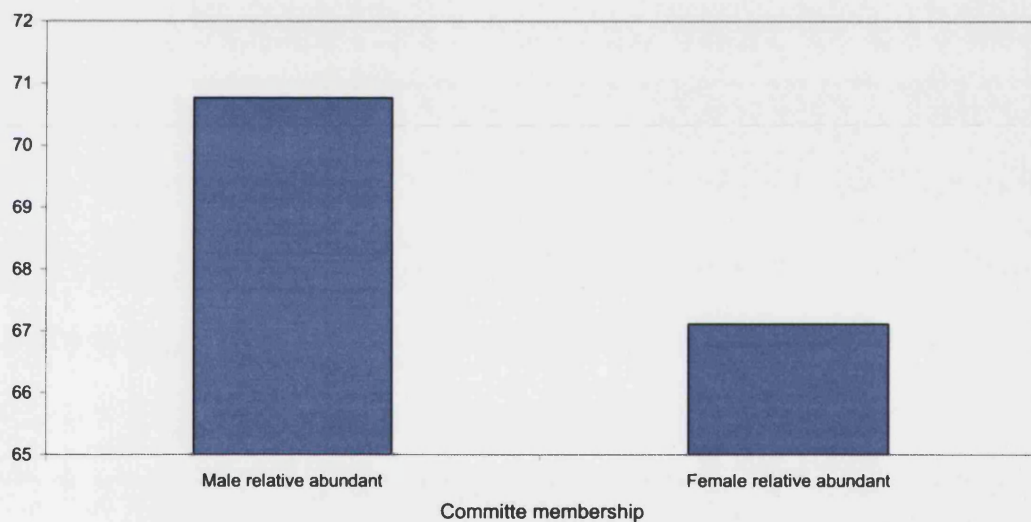
Figure 3.4 Female successful candidates (%), by type of committee membership

However, these results do not give us precise information about the reasons behind this phenomenon. In fact, they are consistent with two hypotheses: (a) male committee members are more generous with female candidates, and (b) female com-

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[148] Results also hold if we do not include the 1995 exam for court secretary, which included a multiple choice test.

mittee members are more strict with female candidates. Hypothesis (a) is consistent with positive gender discrimination working in favour of male candidates, while hypothesis (b) is consistent with some form of statistical discrimination being suffered by female candidates. If the quality of a professional cannot be observed and it is the average quality of that professional group that she is judged by, minorities are more affected by (the quality of) new entrants than non minorities: having just a few women in the Judicial Corps means that one new female judge creates a greater impact on the average quality of female judges than the effect of one new male judge on the average quality of male judges.

In order to try and shed light on this issue, in our second empirical strategy we are going to use our candidate-level information. We take advantage of the fact that in 2003 a multiple choice test was introduced in the judge and prosecutor exam. In 2003 and 2004, the other year for which we have recent data, that particular exam consisted of three stages, all of them qualifying; the first one was a multiple choice test, and the other two were two oral tests. For this type of public exam and years, we use candidates' multiple choice test performance as a proxy of the candidates' objective quality. We cluster standard errors at the committee level. Results are in Table 3.6.

In column (1), we present results from running the following simple regression in the sample of all available candidates:

$$y_{it} = \sigma F candidate_{it} + \gamma_t + \varepsilon_{it}$$

where t denotes year, the dependent variable is the probability that candidate i passes the exam; and $Fcandidate$ is a dummy variable equal to one in the case that candidate i is a woman.

According to these estimates, female candidates have a significantly smaller probability to pass the exam than male candidates.

In column (2), we introduce our quality measure in expression (2), and hence we are running,

$$y_{it} = \sigma \ Fcandidate_{it} + \phi \ quality_{it} + \varphi \ quality_{it}^2 + \gamma_t + \varepsilon_{it}.$$

As expected, higher quality candidates, as measured by their multiple choice test mark, have higher chances to pass the exam. Also, once we introduce the quality of candidates in the regression, the female dummy is no longer significant—suggesting that the result in column (1) was due to unobserved heterogeneity.

In order to study the link between the probability of a candidate's success and the gender composition of the committee, we need to consider the sample of candidates that have successfully passed the multiple choice test—because these are the candidates who take the second stage evaluation—that is, these are the candidates that are actually evaluated by the committees. In this sample, we have information on ten committees. Of those, in five committees there is only one female member; in the other five, there is more.[149] Again, we use as measure of committee membership

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[149] There are no committees with zero women in this sample.

by gender the share of female members in the committee. For this we run:

$$y_{it} = \sigma F candidate_{it} + \varphi s_{it} + \eta F candidate * s_{it} + \phi quality_{it} + \varphi quality_{it}^2 + \gamma_t + \varepsilon_{it}.$$

In column (3) in Table 3.6, we find that female candidates have a lower probability of passing the exam if they are evaluated by a committee with a larger share of women. The effect is similar in magnitude to the effect we found in Tables 3.4 and 3.5, but now is not statistically significant at standard levels, it is only significant at the 14 percent level—however, this is because of the small sample size here: we only have ten committees in those two years.

How big is this effect? Simple calculations show that, for the 2003 judge exam, a woman's chances of passing the exam are 9.4% greater if she is evaluated by a male committee (that is, a committee with only one female member) than if she is evaluated by a female committee (with more than one female member). For 2004, this figure equals 7%.

In sum, this result suggests that the gender composition of a committee does matter for whether a candidate of a particular gender passes the exam or not. In particular, women evaluated by male committees have better chances to pass the exam than women evaluated by female committees. Analogously, men evaluated by female committees are more likely to succeed than men evaluated by male committees.

What can we say about hypotheses (a) and (b)? For the data on 2003 and 2004, the probability to pass for a female candidate increases in 1.7% if evaluated by a committee with only one woman (not significant), consistent with hypothesis

(a); if she is evaluated by a committee with more than one woman, the probability decreases in 1.4% (not significant), consistent with hypothesis (b). In total, then, for a female candidate, being evaluated by a committee with only one or more than one woman increases her chances in 3.1% (significant), which is about 30% change in the observed probability to win. However, the effects that are respectively consistent with (a) and (b) are not statistically significant, hence we cannot base statements on those, either of them could be behind the results, but so could both.

The results from Table 3.6 are suggestive, but they should be taken with caution— first, because they are only marginally significant; indeed, since we only have data for the multiple choice test for 2003 and 2004, the number of committees in these data is small, and hence variability in committee composition is very small. It could also be that these ten committees are not very representative. In truth, there could also exist some omitted committee variable bias (that is, we might be omitting some committee characteristic that is correlated with gender). Furthermore, relaxing the assumption of independence of disturbances within committees, which is important here, requires clustering standard errors at the committee level, which is problematic with such a small number of clusters. Since the multiple choice test is still in use, soon more data will be available that will make it possible to exploit this strategy better.

In sum, with data from only these two years, it is difficult to say much about what could be going on at committees. Our results are consistent with a variery of

situations, for instance with men in committees being more generous towards female candidates, but also with men in committees being less generous towards female candidates whenever there are more women in the committee.

3.5 Discussion

In the previous section, we have found that female candidates that are evaluated by relatively female committees have more chances to pass a public exam than if they are evaluated by relatively male committees. We have also mentioned that this result is consistent with two hypotheses: male committee members are more generous with female candidates, and female committee members are more strict with female candidates.

In this section we suggest possibilities that could be behind this result. Basically, we distinguish an irrational choice interpretation, and some other interpretations that are consistent with rational choice theory.

One the one hand, committee members might have some sort of irrational taste. For instance, it might be that male committee members taste-discriminate against male candidates, while female committee members taste-discriminate against female candidates.

On the other hand, the result could be consistent with rational choice theory under various interpretations: committee members might be maximising (i) the profession's quality, (ii) their individual utility, or (iii) their own group quality.

First, quality maximisation is consistent with our results if women think that men are of higher quality than women. Lack of confidence of women—here, evaluators—might translate into female evaluators believing that the average female candidate is of lower quality than the average male candidate. If women lack confidence for whatever reason, regardless of the fact that this belief might be wrong, we would get results consistent with the hypotheses above. What could justify such a belief? It could be due to parental role transmission or, more generally, social norms. In our particular case, from Table 3.3 we see that male committee members are usually more highly ranked in their profession than female committee members (this is true for all exams but prosecutor exam committee members).[150] Note that this possibility would not necessarily imply the existence of statistical discrimination, as the average grade for the multiple choice is basically the same for both groups (30% for men and 29% for women), and the variance does not vary by gender either. Indeed, as long as the belief exists, we could observe findings such as our result. The underconfidence interpretation is consistent with other experimental literature, such as Bengtsson *et al* (2004).

Second, committee members could be trying to maximise their utility, where identity is one of the arguments as in Akerlof and Kranton (2000). As in that model, we can consider social norms to be (at least partial) determinants of identity. One possibility is that past discrimination is then influencing committee members' votes.

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[150] This in fact comes from the fact that female committee members are younger than male committee members, but could still sustain a wrong belief.

To see this, suppose that, in the past, female candidates were discriminated against by committee members (who used to be all male). The committee members' utility was being maximised because they thought that women were not appropriate for those judicial professions. Back then, had they hired female candidates, the committee members would have suffered a loss in identity and the corresponding utility loss. However, imagine that it is currently considered appropriate for women to become e.g. judges. That is, imagine that the social norm has changed over the decades. The men in committees now will decide towards the hiring of women; even more, they might they tend to hire more women, or women of lower quality, in order to *offset* the identity loss that the old discriminatory practice would be creating in male committee members. That is, since the men in committees discriminated in the past, men who are now in committees are more generous with female than with male candidates.

In the same vein, another possibility is that female committee members' identity suffers if they are thought to be more generous towards their own gender by their fellow committee members. If that is the case, being generous towards the opposite gender would ensure not being identified with such a *feminist* bias and hence would imply a gain in identity and higher utility.

Similarly, female committee members might get a utility gain from anti-female bias if they think that these are 'natural' attributes of (formerly only male) committee members. Thus, in order to maximise their utility, female evaluators enhance their identity as committee members by having an anti-female bias. This could in fact

compensate for their own identity loss for having an occupation that does not conform to traditional gender roles.

Third, committee members might be maximising the prestige of the whole professional collective. Suppose that there exists uncertainty about the quality of female and male members of the Judicial Corps. That is, imagine that the average quality of members is publicly known, but the individual quality is not. In that case, committee members would want to increase the average quality of their group. Considering that the gender dimension is one identity dimension (i.e., female judges might be seen differently than male judges), both men and women in committees would be interested in increasing their respective group's average quality. This would be consistent with women being tougher on female entrants, and men being tougher on male entrants.[151]

Some, or a combination, of the explanations in these three groups could be behind our findings. However, the issue is further complicated by the fact that committee formation is not given. However, it is regulated by the rules described in the appendix. Moreover, committee composition is orthogonal to the gender of evaluated candidates. All in all we cannot say more about what might be going on within committees at this point. In truth, in the near future we shall examine a more longer-term picture: that which includes data from the time the first committee that included women was formed to evaluate in public exams.

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[151] This does not take into account that both groups would end up increasing the quality of the whole group; given uncertainty, the situation would be consistent with rational choice.

3.6 Conclusion

Gender parity policy is being adopted in many countries on the basis that women are underrepresented in top level positions at both the public and the private spheres. The motivation underlying the imposition of gender parity is the existence of (taste) discrimination against women. Related is the perception that there exists a 'glass ceiling'—beyond which women cannot go any further. If women are not able to break the glass ceiling, imposing gender parity at the top level should increase hiring of other women, and therefore in turn increase the percentage of women in decision-making.

This paper uses data from Spanish public exams that provide evidence that gender parity will not increase the number of women in decision-making positions, in fact, our main finding is that gender parity would reduce that number. The analysis of Spanish exams is adequate because of the characteristics of their evaluation process: first, candidates are allocated to committees randomly, which automatically eliminates concerns about endogeneity; second, the subjects and the experiment are actually taken from real life, hence avoiding the usual *caveats* of experimental work; and finally the experiment is relevant because of the importance, and magnitude, of public exams in Spain and other countries.

We use data from candidates to the Judicial Corps between 1995 and 2004, and find that female (male) candidates are more likely to be successful when evaluated by committees in which there are more women (men). In particular, we find that a

female candidate's chances of passing the exam are 5.5% greater if she is evaluated by a committee with more male committee members than the median committee, than if she is evaluated by a committee with fewer male committee members than the median. Moreover, as we show in the empirical anaylsis, these differences are statistically significant.

These results suggest that the reason for the low numbers of women in decision-making positions does not lie with taste discrimination. The results suggests that the reason is more complicated—either consistent with statistical discrimination in connection with women's higher likelihood to withdraw from labour market activity,[152] or consistent with social norms and identity-based gender roles.[153] The main policy lesson from this paper is thus that introducing gender parity in recruiting committees will not increase the numbers of women in decision-making posts. Instead, a deeper understanding of factors limiting women's participation should be gathered in order to derive adequate policy. In the Spanish case particularly, a quick glance at cabinet members *resumes* shows the difficulty of reconciling family and career, which brings us to Lazear and Rosen (1990).[154]

Another implication of our work is that, given our finding that evaluation is sensitive to committee compostion, it is important to make selection procedures more

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[152] Lazear and Rosen (1990).

[153] Akerlof and Kranton (2000).

[154] While the eight male cabinet members have 24 children in total, the eight female cabinet members only have five in total (*El País*, October 16, 2005).

objective. In that sense, the recent introduction of a multiple choice test in some public exams goes in the right direction.

Finally, it would be interesting to gather data from exams previous to 1995, as the inclusion of more past data should be useful in order to observe any trends and understand this phenomenon better.

3.7 Appendix: Committee composition and formation

The exams for judges and prosecutors were separate until 2000, but since 2001 it has been joint for both types of candidates; and rules have been common since then.

For the prosecutor exam, in place until 2000, the rules were as follows. Committees evaluating prosecutor candidates had to be composed of one prosecutor from the Superior Court of Justice (who was to preside over the committee), two prosecutors, one judge, one professor in law, one lawyer (to be chosen by the Lawyers' Corps), a public defender (affiliated with the Ministry of Justice), and one prosecutor working for the Technical Secretariat in the State's General Prosecuting Office (who was to be the committee's secretary) (*Ley 50/1981, December 30*).

The prosecutor exam consisted of two oral tests. In the first one, the candidate had to develop five topics drawn from a lottery; the five topics had be developed within 75 minutes, and the candidate could not spend more than 20 minutes in each topic. The topics were in the following fields: one in general theory of law and constitutional law, two in civil law, and two in criminal law. In the second test,

candidates had to develop a topic drawn from a lottery for each of these fields: civil procedural law, criminal procedural law, administrative law, commercial law, and labour law. The candidate was allowed 30 minutes before the development of each topic, but could not have access to any law textbook or document during the exam.

The date, time, and venue for the first test was to be announced at least 20 days in advance. The details for the second test were to be determined by the first evaluating committee, but there had to be at least one month between both tests (*Orden December 18, 1996*).

For the judge exam, we have to distinguish before and after 1998. Until 1997, the committee was to be presided over by the President of the Superior Court of Justice or a Judge of the Superior Court of Justice. The rest of the members had to include one judge, one prosecutor, two law professors in two different fields, one professional lawyer, and another judge, who was to be the committee's secretary (*Ley Orgánica 6/1985, July 1*). From 1998 until 2000, the committee was to be presided over by the President of the Superior Court of Justice or a Judge of the Superior Court of Justice. The rest of the committee members had be two judges, one prosecutor, two law professors in two different fields, one lawyer with over ten years of experience, one public defender, a court secretary of first category, and another judge, member of the technical agencies in the General Council of the Judicial Corps with a law degree, who was to be the committee's secretary. Whenever it was not possible to include

law full professors, associate professors were to be considered (*Ley Orgánica 5/1997, December 4*).

In the case of exams to become judge or prosecutor, in place since 2001, committees are composed by nine members. Each committe is formed by a committee president, who must be a top member of the Judicial Corps—either a judge, in the case of oddly numbered committees, or a public prosecutor, in the case of evenly numbered committees; all from a Superior Court of Justice. The president appoints the other eight members. The composition of the other eight members in the committee must include two judges, two public prosecutors, one law professor, one public defender, and one lawyer with over ten years of professional experience. Finally, the committee secretary is a court secretary of first category.

There is the possibility that one or more committees consider that the number of satisfactory candidates within the pool of evaluated candidates is lower than the number of positions that the committee has been assigned. In that case, the vacant positions are transferred to other committees for which the number of satisfactory candidates is larger than the number of positions the committee has been assigned (*Ley Orgánica 9/2000, December 22*). That is, there is not a direct trade off between any two candidates for a specific fixed number of positions, as the number of positions is in fact somewhat variable.

Since 2003, the judge and prosecutor exams consists of three stages, all of which are qualifying. First a multiple choice test, and then two oral tests. The mate-

rial covered by the first and second stages is the same. The topics in the material are published in the BOE.

Court secretary exam committees are composed by seven members. The president must be a judge, and there must be a second category prosecutor, three court secretaries, one law professor, and one lawyer with more than five years of professional experience (*Ley Orgánica 19/2003, December 23*). In 1995, the exam contained a multiple choice test.

	Prosecutor	Judge & Prosecutor				Court Secretary			
Year	2000	2002	2003	2004	2005	2000	2001	2002	2003
Female (%)	69.1	68	68.6	68.2	68.7	71.9	71	71.3	72.2
Geographic origin (%)									
Madrid	21.8	19.6	21.8	21.8	21	19.4	18.9	17.6	17.4
Andalusia	19.2	17.6	18.6	18.2	19				
Catalonia	8.51	9.04	9.27	10.2	9.95				
Years of experience									
One			77.6	78	82.3		53.7	61.1	47.4
Two		59		59.8	65.7			36.7	29.5
Three			42.9		48.7				17.9
Four				30.7					
Five					23.3				
Number of candidates	4487	5122	4973	4732	4082	1226	1523	1680	2246

Notes: experience calculated from looking at names repeated overt the years. e.g. candidates
with one year experience are candidates who are taking the exam for at least the second time.

Table 3.1: Descriptive statistics - candidate characteristics, by type of exam and year

	Judge	Prosecutor	Judge & Prosecutor	Court Secretary
Available years	1995.1996,1998, 1999,2000	1995,1997,1999, 2000	2001,2002,2003, 2004	1995,1998,1999, 2000,2001,2002, 2003
Average number of committees per year	10	9	8.25	4.43
Number of members per committee	9 (1995,1996), 10	8	9	7
President's occupation	Superior Court Judge	Superior Court Prosecutor	Superior Court Judge or Prosecutor[1]	Judge[3]
Other members' occupations				
Judge	3/4[2]	1	2	1/0
Prosecutor	1	3	2	0/1
State lawyer	1	1	1	1/0
Lawyer	1	1	1	1
Professor	2	1	1	1
Court secretary	0/1	0	1	2/3

Notes: 1\Every odd (even) committee is presided by a judge (prosecutor), alternatively. In our data set, a prosecutor (judge) has been the committee's president 48.5% (51.5%) of the time. 2\The composition of committees for the judge and court secretary exams changed over the period (in 1998). We provide the profession composition before (first number) and after (second number) the change, where applicable. 3\From a Superior Court of Justice until 1997. For information on committee composition rules see the appendix.

Table 3.2: Committee composition, by type of exam

	Judge		Prosecutor		Judge & Prosecutor		Court Secretary	
	Female	Male	Female	Male	Female	Male	Female	Male
Age	41.3	48.8	38.7	44.8	48.3	52	40.2	45.4
	(8.67)	(11.5)	(6.71)	(11.3)	(7.95)	(12.3)	(5.23)	(10.9)
Entry age	29.4	30.4	30	29.2	29.7	29.8	28.5	31
	(4.37)	(5.81)	(5.19)	(4.31)	(5.18)	(4.96)	(3.53)	(6.39)
Relative rank	0.51	0.69	0.46	0.41	0.47	0.63	0.57	0.61
	(0.22)	(0.26)	(0.28)	(0.20)	(0.19)	(0.27)	(0.25)	(0.31)
Number of observations	110	373	78	210	69	228	104	162

Notes: standard errors in parentheses. The relative rank index has been calculated based on the member's ranking within her age group (for Judicial Corps members only). A higher number means higher in the rank. Entry age is the age at which the member entered the Judicial Corps, and therefore does not apply to non-members (i.e. professors and lawyers).

Table 3.3: Descriptive statistics - committee members, by type of exam

	Dependent variable:					
	Female successful candidates			Male successful candidates		
	(1)	(2)	(3)	(4)	(5)	(6)
Female share in the committee	-1.85			2.11*		
	(1.47)			(1.23)		
Female share in the committee, members of Judicial Corps only		-3.02***			1.70**	
(including the president)		(0.83)			(0.73)	
Female share in the committee, members of Judicial Corps only			-1.72**			0.70
(excluding the president)			(0.74)			(0.85)
Gender of president (=1 if female)			-2.72			3.30***
			(1.96)			(1.20)
Female share in the committee, not members of Judicial Corps		0.39	0.29		0.33	0.46
		(1.04)	(1.02)		(0.30)	(0.97)
Mean age of committee members			-0.48			0.86*
			(0.83)			(0.44)
Mean age of committee members, squared			0.004			-0.01*
			(0.01)			(0.004)
Mean entry age of committee members			0.14			-0.01
			(0.13)			(0.18)
Mean ranking of committee			8.16*			-1.66
			(4.19)			(5.03)
Exam type dummies*Year dummies	yes	yes	yes	yes	yes	yes
Number of observations	150	150	150	150	150	150

Notes: robust standard errors clustered at the exam level in parentheses. Regressions include a dummy for the first committee, which sometimes evaluates fewer candidates than other committees (not shown). Age, age of entry and ranking is only available for Judicial Corps members; entry age is the age at which the member entered the Judicial Corps.*significant at 10%; **significant at 5%; ***significant at 1%.

Table 3.4: Gender composition of committee and female and male successful candidates

	Total successful candidates			Female successful candidates (%)		
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
Female share in the committee	0.26			-0.09*		
	(1.44)			(0.05)		
Female share in the committee, members of Judicial Corps only		-1.32			-0.13**	
(including the president)		(0.80)			(0.04)	
Female share in the committee, members of Judicial Corps only			-1.02			-0.08**
(excluding the president)			(0.98)			(0.03)
Gender of president (=1 if female)			0.57			-0.12***
			(2.84)			(0.02)
Female share in the committee, not members of Judicial Corps		0.72	0.74		0.03	0.02
		(0.94)	(0.99)		(0.05)	(0.04)
Mean age of committee members			0.38			-0.05**
			(0.85)			(0.02)
Mean age of committee members, squared			-0.004			0.001**
			(0.01)			(0.001)
Mean entry age of committee members			0.13			0.001
			(0.17)			(0.01)
Mean ranking of committee			6.51			0.11
			(6.80)			(0.15)
Exam type dummies*Year dummies	yes	yes	yes	yes	yes	yes
Number of observations	150	150	150	150	150	150

Notes: robust standard errors clustered at the exam level in parentheses. Regressions in the left panel include a dummy for the first committee, which sometimes evaluates fewer candidates than other committees (not shown). Age, age of entry and ranking is only available for Judicial Corps members; entry age is the age at which the member entered the Judicial Corps. *significant at 10%; **significant at 5%; ***significant at 1%.

Table 3.5: Gender composition of committee and total successful candidates and percentage of female successful candidates

	Dependent variable=1 if candidate succeeds, =0 otherwise		
Probit	All candidates		Candidates who passed the qualifying multiple choice test
	(1)	(2)	(3)
Female candidate (=1 if female)	-0.008**	-0.00001	0.023
	(0.004)	(0.0002)	(0.018)
Female share in the committee			0.07
			(0.05)
Female candidate*			-0.092
Female share in the committee			(0.064)
Multiple choice mark		0.001***	0.028***
		(0.0002)	(0.011)
Multiple choice mark-squared		-0.0004**	-0.0001
		(0.0001)	(0.0001)
Year fixed effects	yes	yes	yes
Number of observations	9698	8118	3478

Notes: robust standard errors clustered at the committee level in parentheses. Year fixed-effects here are a dummy for either year 2003 or 2004. There are three stages, all of them qualifying for passing the public exam. The first stage is a multiple choice test. Stages two and three are both oral tests. In the left panel, we consider all candidates. In the right panel, we consider candidates evaluated by committees.*significant at 10%;**significant at 5%;***significant at 1%.

Table 3.6: Probability of success by gender and gender composition of committee, 2003 and 2004

Conclusions

This thesis attempts to provide some evidence on the role of gender and economic incentives on development with a focus on social norms. One conclusion that comes up from this thesis is that gender inequality of the forms considered here is not eroded by the forces of economic growth only. In the first case, participation in dowry payments in Matlab in rural Bangladesh has dramatically increased in years of economic growth. In the second case, and as Mammen and Paxson (2000) found in their study of India in the 1990s, it seems that it is richer states where women are able to afford the social norm of not working and hence participate less in the formal labour market. This implies that we cannot derive precise welfare implications, for if it is the household that decides not to lose utility (or identity, in the sense of Akerlof and Kranton 2000) from the wife's work, then this situation of 'discrimination', although not optimal in aggregate terms, would be utility maximising.

In order to improve gender equality, we should think of policies that can improve the situation of women in society. In the case of dowry in Bangladesh, according to our finding that dowry is not a social norm, but rather a rational response to the unequal gender relations in the social and legal sphere, women should be given an equal social standing with respect to men, and equal legal rights. While the latter might be more feasible to achieve in the case that there exists a political intention in that direction, the former is far more difficult: it needs a major change in attitudes towards women's

role in society—for indeed until working women are not accorded equal status with married women, women will still depend on the provisions of marriage for their social being. In rural Bangladesh, the prohibition of dowry would not, in light of our findings, be a useful policy to improve the status of women, as dowry arises as a consequence of women's unequal rights and serves the role that existed in the past with dower and alimony. This is in connection with women and work in India: it will be necessary for both men and women to change the social norms regarding women's work in order to achieve greater equality of women in the labour sphere, and hence greater economic development. Useful policies would be those that try and encourage the participation of women in the public and working sphere; however often it is only large changes in perceptions that can bring about changes in social norms.

The findings in chapter 3, we analyse gender inequality at a later stage of development: top level positions in the economy. In particular, we have analysed the effectiveness of gender quotas in Spain by looking at the case of public examinations. Gender parity, or gender quotas, is the current policy in some developed countries towards gender equality in top positions. Our results suggest that this policy might not be useful. Indeed, and as discussed in the chapter, if the reason for the low numbers of women in top positions is not taste-discrimination, but rather either statistical discrim-

ination or social norms, gender parity will not increase those numbers—unless, again in the case of social norms, the quota brings about a major change in attitude.

The bottomline of this thesis is that regarding gender inequality, for policy design we should clarify the reasons behind gender inequality. It is then that we can devise instruments and policy that can tackle the source of the inequality. For instance, in chapter 1 dowry prohibition will not solve the gender inequality that generates dowry; consequently it is unlikely that dowry prohibition erradicates dowry in rural Bangladesh. This, in fact, is consistent with reports that dowry in India has not diminished but rather increased after its prohibition in 1981. In chapter 2, the social norm of no female formal labour participation does not change with development alone; a change of attitude and cultural values can only be brought about with the recognition of women's potential contribution to the labour market. In chapter 3, gender parity laws that increase the number of women in recruitment committees will not work towards more women in decision-making, because it is not taste-discrimination of employers that is behind the low numbers of women decision-making. The reason should be found within more complicated issues, possibly dealing with confidence, maternity, and identity.

References

[1] Acemoglu, Daron, Philippe Aghion, and Fabrizio Zilibotti (2002), Distance to Frontier, Selection, and Economic Growth, Working Paper No. 9066, National Bureau of Economic Research

[2] Ahmed, Rahnuma, and Milu Shamsun Naher (1987), Brides and the Demand System in Bangladesh. A Study, Dhaka: Centre for Social Studies, Dhaka University

[3] Akerlof, George A. and Rachel E. Kranton (2000), Economics and Identity, *Quarterly Journal of Economics*, 115 (3), pp. 715-53.

[4] Amin, Sajeda, Family Structure and Change in Rural Bangladesh (1996), The Population Council, Research Division, Working Paper No. 87

[5] Amin, Sajeda, and Mead T. Cain (1995), The Rise of Dowry in Bangladesh, in *The Continuing Demographic Transition*, ed. by Jones, Gavin. W., John C. Caldwell, Robert M. Douglas, and Rennie M. D'Souza, Oxford: Oxford University Press

[6] Anderson, Siwan (2004), Dowry and Property Rights, mimeo, University of British Columbia

[7] Anderson, Siwan (2003), Why Dowry Payments Declined With Modernization in Europe But Are Rising in India, *Journal of Political Economy*, 111 (2), pp. 269-310.

[8] Anderson, Siwan (2000a), Why the Marriage Squeeze Cannot Cause Dowry Inflation, mimeo, Department of Economics, Tilburg University

[9] Anderson, Siwan (2000b), The Economics of Dowry Payments in Pakistan, mimeo, Department of Economics, Tilburg University

[10] Arrow, Kenneth (1972), Models of Job Discrimination and Some Mathematical Models of Race in the Labor Market, in *Racial Discrimination in Economic Life*, ed. by A. Pascal, Lexington: Lexington Books

[11] Arrow, Kenneth (1973), The Theory of Discrimination, in *Discrimination in Labor Markets*, ed. by O. Ashenfelter and A. Rees, Princeton: Princeton University Press

[12] Bagüés, Manuel F. (2005), ¿Qué determina el éxito en unas oposiciones?, FEDEA Documento de Trabajo 2005-01

[13] Baltagi, Badi H., and Ping X. Wu (1999), Unequally Spaced Panel Data Regressions With AR(1) Disturbances, *Econometric Theory*, 15 (6), pp. 814-23.

[14] Becker, Gary S. (1965), A Theory of the Allocation of Time, *Economic Journal*, 75, pp. 493-517.

[15] Becker, Gary S. (1991), A Treatise on the Family, Cambridge, Massachussets: Harvard University Press

[16] Becker, Gary S. (1971), The Economics of Discrimination, Chicago: The University of Chicago Press

[17] Becker, Gary S. (1985), Human Capital, Effort, and the Sexual Division of Labor, *Journal of Labor Economics*, 3 (1), pp. S33-80.

[18] Bengtsson, Claes, Mats Persson and Peter Willenhag (2004), Gender and Overconfidence, Institute for International Economic Studies (Stockholm University), Seminar Paper No. 730

[19] Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan (2003), How Much Should We Trust Differences-in-Differences Estimates?, mimeo, University of Chicago and MIT

[20] Bertrand, Marianne and Kevin F. Hallock (2001), The Gender Gap in Top Corporate Jobs, *Industrial and Labor Relations Review*, Vol. 55(1), pp. 3-21

[21] Besley, Timothy, and Robin Burgess (2002), The Political Economy of Government Responsiveness: Theory and Evidence from India, *Quarterly Journal of Economics*, 117 (4), pp. 1415-51.

[22] Besley, Timothy, and Robin Burgess (2004), Can Labor Regulation Hinder Economic Performance? Evidence from India, *Quarterly Journal of Economics*, 119 (1), pp. 91-134.

[23] Besley, Timothy and Anne Case (2003), Political Institutions and Policy Choices: Evidence from the United States, *Journal of Economic Literature*, 41(1), pp. 7-73.

[24] Besley, Timothy, Robin Burgess and Berta Esteve-Volart (2005), Operationalizing Pro-Poor Growth: India Case Study, mimeo, London School of Economics

[25] Bhat, P. N. Mari, and Shiva S. Halli (1999), Demography of Brideprice and Dowry: Causes and Consequences of the Indian Marriage Squeeze, *Population Studies*, 53 (2), pp. 129-48.

[26] Bhuiya, Abbas, and Mushtaque Chowdhury (1997), The Effect of Divorce on Child Survival in a Rural Area of Bangladesh, *Population Studies*, 51 (1), pp. 57-61.

[27] Billig, Michael S. (1992), The Marriage Squeeze and the Rise of Groom-Price in India's Kerala State, *Journal of Comparative and Family Studies*, 23 (2)

[28] Blackden, C. Mark, and Chitra Bhanu (1999), Gender, Growth, and Poverty Reduction: Special Program of Assistance for Africa, World Bank Technical Paper No. 428, World Bank

[29] Blank, Rebecca M. (1991), The Effects of Double-Blind versus Single-Blind Reviewing: Experimental Evidence from *The American Economic Review*, *American Economic Review*, Vol. 81(5), pp. 1041-67.

[30] Bloch, Francis, and Vijayendra Rao (2003), Terror as a Bargaining Instrument: A Case-Study of Dowry Violence in Rural India, *American Economic Review*, 92 (4), pp. 1029-43.

[31] Blau, Francine D. (1996), Where Are We in the Economics of Gender? The Gender Pay Gap, Working Paper No. 5664, National Bureau of Economics Research

[32] Blau, Francine D., and Lawrence M. Kahn (1994), Rising Wage Inequality and the U.S. Gender Gap, *American Economic Review*, 84 (2), pp. 23-8.

[33] Blau, Francine D., and Lawrence M. Kahn (1999), Analyzing the Gender Pay Gap, *Quarterly Review of Economics and Finance*, 39(5), pp. 625-46.

[34] Boserup, Ester (1970), Woman's Role in Economic Development, New York: St. Martin's Press

[35] Botticini, Maristella, and Aloysius Siow (2003), Why Dowries?, *American Economic Review*, 93 (4), pp. 1385-98.

[36] Brown, Philip H., Dowry and Intrahousehold Bargaining: Evidence from China, mimeo, University of Michigan

[37] Bulow, Jeremy I. and Lawrence H. Summers (1986), A Theory of Dual Labor Markets with Application to Industrial Policy, Discrimination and Keynesian Unemployment, *Journal of Labor Economics*, 4, pp. 376-415.

[38] Burgess, Robin, and Juzhong Zhuang (2001), Modernisation and Son Preference, mimeo, London School of Economics and Asian Development Bank

[39] Butler, David, Ashol Lahiri, and Prannoy Roy (1995), India Decides: Elections 1952-1995, New Delhi: Books and Things

[40] Cain, Mead (1981), Risk and Insurance: Perspectives on Fertility and Agrarian Change in India and Bangladesh, *Population and Development Review*, 7 (3), p. 435-74.

[41] Caldwell, John C., P. H. Reddy, and Pat Caldwell (1983), The Causes of Marriage Change in South India, *Population Studies*, 37 (3)

[42] Chen, Chung-min (1985), Dowry And Inheritance, in *The Chinese Family and Its Rural Behavior*, ed. by Jih-chang Hsieh and Ting-chang Chuang, Taipei: Inst. Ethnology, Academia Sinica

[43] Coate, Stephen, and Sharon Tennyson (1992), Labor Market Discrimination, Imperfect Information and Self Employment, *Oxford Economic Papers*, 44, pp. 272-88.

[44] Cogan, J. (1980), Labor Supply with Costs of Market Entry, in *Female Labor Supply*, ed. by J. Smith, Princeton: Princeton University Press

[45] Coleman, James S. (1990), Foundations of Social Theory, Cambridge: The Belknap Press of Harvard University Press

[46] Collier, Paul (1994), Gender Aspects of Labour Allocation during Structural Adjustment: Theoretical Framework and the Africa Experience, in *Labour*

Markets in an Era of Adjustment, Vol. 1, ed. by Susan Horton, R. Hanbur, and D. Mazumbur, Washington: World Bank

[47] Dahlerup, Drude (2006), Women, Quotas and Politics, London: Routledge

[48] Deaton, Angus (1989), Looking for Boy-Girl Discrimination in Household Expenditure Data, *World Bank Economic Review*, 3 (1), pp. 1-15.

[49] Deaton, Angus (1997), The Analysis of Household Surveys: A Microeconometric Approach to Development Policy, Baltimore: Johns Hopkins University Press

[50] Dollar, David, and Roberta Gatti (1999), Gender Inequality, Income, and Growth: Are Good Times Good for Women?, Working Paper No. 1, Policy Research Report on Gender and Development, World Bank

[51] Drèze, Jean, and Amartya Sen, India (1995), Economic Development and Social Opportunity, Oxford: Oxford University Press

[52] Duflo, Esther and Raghabendra Chattopadhyay (2004), Women as Policy Makers: Evidence from a Randomized Policy Experiment in India, *Econometrica*, 72(5), pp. 1409-43.

[53] Duncan, O.D. and Duncan, B. (1955), A Methodological Analysis of Segregation Indices, *American Sociological Review*, 20 (2), pp. 200-17.

[54] Dunlop, John E., and Victoria A. Velkoff (1999), Women and the Economy in India, U.S. Census Bureau, Official Statistics, December

[55] Duraisamy, Malathy, and P. Duraisamy (1996), Sex Discrimination in Indian Labour Markets, *Feminist Economics*, 2 (2), pp. 41-61.

[56] Duraisamy, Malathy, and P. Duraisamy (1999a), Women in the Professional and Technical Labour Market in India: Gender Discrimination in Education, Employment and Earnings, *Indian Journal of Labour Economics*, 42 (4), pp. 599-612.

[57] Duraisamy, Malathy, and P. Duraisamy (1999b), Gender Bias in the Scientific and Technical Labour Market: A Comparative Study of Tamil Nadu and Kerala, *Indian Economic Review*, 34 (2), pp. 149-69.

[58] Edlund, Lena (2000), The Marriage Squeeze Interpretation of Dowry Inflation: A Comment, *Journal of Political Economy*, 108 (6), p. 1327-33.

[59] Edlund, Lena (2001), Dear Son – Expensive Daughter: Do Scarce Women Pay to Marry?, mimeo, Columbia University

[60] Edlund, Lena and Rohini Pande (2002), Why Have Women Become Left-Wing? The Political Gender Gap and the Decline in Marriage, *Quarterly Journal of Economics*, 117, p. 917-61.

[61] Ekvall, R. B. (1968), Fields on the Hoof, New York

[62] Elster, Jon (1989a), Social Norms and Economic Theory, *Journal of Economic Perspectives*, 3, pp. 99-117.

[63] Elster, Jon (1989b), The Cement of Society, Cambridge: Cambridge University Press

[64] Elster, Jon (1996), Rationality and the Emotions, *Economic Journal*, 106, pp. 1386-97.

[65] Esposito, John L. (2001), Women in Muslim Family Law, New York: Syracuse University Press

[66] Esteve-Volart, Berta (2000), Sex Discrimination and Growth, Working Paper No. 84, International Monetary Fund

[67] Fershtman, Chaim, Kevin Murphy, and Yoram Weiss (1996), Social Status, Education, and Growth, *Journal of Political Economy*, 104 (1), pp. 108-32.

[68] Forsythe, Nancy, Roberto Patricio Korzeniewicz, and Valerie Durrant (2000), Gender Inequalities and Economic Growth: A Longitudinal Evaluation, *Economic Development and Cultural Change*, 48 (3), pp. 573-617.

[69] Foster, Andrew D. and Mark R. Rosenzweig (1996), Comparative Advantage, Information and the Allocation of Workers to Tasks: Evidence from an Agricultural Labor Market, *Review of Economic Studies*, 63 (3), pp. 347-74.

[70] Foster, Andrew D., and Nizam U. Khan (2000), Equilibrating the Marriage Market in a Rapidly Growing Population: Evidence from Rural Bangladesh, mimeo, Brown University and University of Colorado, ICDDRB

[71] Francois, Patrick (1998), Gender Discrimination without Gender Difference: Theory and Policy Responses, *Journal of Public Economics*, 68, pp. 1-32.

[72] Freedman, Maurice (1970), Ritual Aspects of Chinese Kinship and Marriage, in Familiy and Kinship in *Chinese Society*, ed. by Maurice Freedman, Stanford, California: Stanford University Press

[73] Frechette, Guillaume R., Francois Maniquet and Masimo Morelli (2005), Incumbents' Interests, Electoral Rules, and Endogenous Affirmative Action Laws: Gender Bias Leads to Gender Quotas, mimeo, New York University

[74] Fryer, Roland G., and Glenn Loury (2005), Affirmative Action and Its Mythology, *Journal of Economics Perspectives*, Vol. 19(3)

[75] Galor, Oded, and David N. Weil (1996), The Gender Gap, Fertility, and Growth, *American Economic Review*, 86 (3), pp. 374-87.

[76] Gaulin, Steven, and James S. Boster (1990), Dowry and Female Competition, *American Anthropologist*, 92 (4), pp. 994-1005.

[77] Gneezy, Uri and Aldo Rustichini (2004), Gender and competition at a young age, *American Economic Review Papers and Proceedings*, May, pp. 377-81.

[78] Gneezy, Uri, Muriel Niederle and Aldo Rustichini (2003), Performance in Competitive Environments: Gender Differences, *Quarterly Journal of Economics*, Vol. 118(3), pp. 1049 - 1074

[79] Goldin, Claudia (1990), Understanding the Gender Gap: An Economics History of American Women, New York: Oxford University Press

[80] Goldin, Claudia (1995), The U-Shaped Female Labor Force Function in Economic Development and Economic History, in *Investment in Women's Human Capital*, ed. by Paul Schultz, Chicago: Chicago University Press

[81] Goldin, Claudia and Cecilia Rouse (2000), Orchestrating Impartiality: The Effect of "Blind" Auditions on Female Musicians, *American Economic Review*, Vol. 90(4), pp. 715-41.

[82] Goodman, Irene F., Christine M. Cunningham and Cathy Lachapelle (200), The Women's Experience in College Engineering, Goodman Research Group, Inc.

[83] Goody, Jack (1973), Bridewealth and Dowry in Africa and Eurasia, in *Dowry and Bridewealth*, ed. by Jack R. Goody and Stanley J. Tambiah, *Cambridge Papers in Social Anthropology*, No. 7, Cambridge: Cambridge University Press

[84] Gross, Edward (1968), Plus Ca Change..: the Sexual Structure of Occupations Over Time, *Social Problems*, 16 (1), pp. 198–208.

[85] Grupo Especial de Trabajo sobre Buen Gobierno (2006), *Proyecto de Código Unificado de Recomendaciones de Buen Gobierno de Sociedades Cotizadas*

[86] Heckman, J. (1976), The Common Structure of Statistical Models of Truncation, Sample Selection, and Limited Dependent Variables and a Simple Estimator for Such Models, *Annals of Economic and Social Measurement 5*, pp. 475-92.

[87] Heckman, J. (1979), Sample Selection Bias As a Specification Error, *Econometrica*, 47, pp.153-61.

[88] Hochschild, Arlie and Anne Machung (1990), The Second Shift, New York: Avon.

[89] Horrace, William C., and Ronald L. Oaxaca (2001), Inter-Industry Wage Differentials and the Gender Wage Gap: An Identification Problem, *Industrial and Labour Relations Review*, 54 (3), pp. 611-8.

[90] Hossain, Shahria (2003), Laws dealing with marriage and divorce are not friendly to women, India News – The Independent, 26th February

[91] International Labour Office (1995), Gender, Poverty and Employment: Turning Capabilities into Entitlements, Geneva: International Labour Office

[92] Jaffor Ullah, A. H. (2000), Rife De-Sanskritization of Names in Bangladesh, News from Bangladesh, 31 May

[93] Jahan, Roushan (1988), Hidden Wounds, Visible Scars: Violence Against Women in Bangladesh, in *Structures of Patriarchy: The State, the Community and the Household*, ed. by Bina Agarwal, London: Zed

[94] Kamal, Sultana, Law for Muslim Women in Bangladesh,

available at http://www.wluml.org/english/publications/dossiers/dossier4/ law-womenbang.htm

[95] Kanbur, S. M. (1979), Of Risk Taking and the Personal Distribution of Income", *Journal of Political Economy*, 87 (4), pp. 769-97.

[96] Kézdi, Gábor (2002), Robust Standard Error Estimation in Fixed-Effects Panel Models, mimeo, University of Michigan

[97] Khan, Azizur Rahman, and Mahabub Hossain (1989), The Strategy of Development in Bangladesh, London: Macmillan

[98] Kihlstrom, Richard E., and Jean-Jacques Laffont (1979), A General Equilibrium Entrepreneurial Theory of Firm Based on Risk Aversion, *Journal of Political Economy*, 87 (4), pp. 719-48.

[99] Klasen, Stephan (1999), Does Gender Inequality Reduce Growth and Development? Evidence from Cross-Country Regressions, Working Paper No. 7, Policy Research Report on Gender and Development, World Bank

[100] Knowles, Stephen, Paula K. Lorgelly, and P. Dorian Owen (2002), Are Educational Gender Gaps a Brake on Economic Development? Some Cross-Country Empirical Evidence, *Oxford Economic Papers*, 54 (1), pp. 118-49.

[101] Kremer, Michael (1993), The O-Ring Theory of Economic Development, *Quarterly Journal of Economics*, 108 (3), pp. 551-75.

[102] Krueger, Alan, and Mikael Lindahl (2001), Education for Growth: Why and for Whom?, *Journal of Economic Literature*, 39, pp. 1101-36.

[103] Kumar, Arun, Sangeetha Prushothaman, Simone Purohit, Padma, and Anil Kumar (1999), Women Workers: Inequalities at Work - Report of the Survey of Women Workers' Working Conditions in Industry, Best Practices Foundation, Bangalore, India

[104] Kundu, Amitabh (1999), Trends and Pattern of Female Employment: A Case of Organised Informalisation, in *Gender and Employment in India*, ed. by Alakh N. Sharma and T. S. Papola, Delhi: Institute of Economic Growth

[105] Kuznets, Simon (1955), Economic Growth and Income Inequality, *American Economic Review*, 45, pp. 1-28.

[106] Lassen, David Dreyer (2005), The Effect of Information on Voter Turnout: Evidence from a Natural Experiment, *American Journal of Political Science*, 49 (1)

[107] Lavy, Victor (2004), Do Gender Stereotypes Reduce Girls' Human Capital Outcomes? Evidence from a Natural Experiment, mimeo, Hebrew University of Jerusalem

[108] Lazear, Edward P. and Sherwin Rosen (1990), Male-Female Job Differentials in Job Ladders, *Journal of Labor Economics*, 8, pp. S106-123.

[109] Lindbeck, Assar, Sten Nyberg, and Jorgen Weibull (1999), Social Norms and Economic Incentives in the Welfare State, *The Quarterly Journal of Economics*, 114 (1), pp.1-35.

[110] Lindenbaum, Shirley (1981), Implications for Women of Changing Marriage Transactions in Bangladesh, *Studies in Family Planning*, 12 (11)

[111] Lucas, Robert E., Jr. (1978), On the Size Distribution of Business Firms, *Bell Journal of Economics*, 9 (2), pp. 508-23.

[112] Lundberg, Shelly, and Robert A. Pollak (1993), Separate Spheres Bargaining and the Marriage Market, *Journal of Political Economy*, 101 (6), pp. 988-1010.

[113] Mabud, Mohammed A. (1985), Women's Development, Income and Fertility in Bangladesh, Dhaka: External Evaluation Unit, Planning Commission, Canadian International Development Agency

[114] Madheswaran, S., and T. Lakshmanasamy (1996), Occupational Segregation and Earnings Differentials by Sex: Evidence from India, *Artha Vijnana*, 38 (4), pp. 372-86.

[115] Mammen, Kristin and Christina Paxson (2000), Women's Work and Economic Development, *Journal of Economic Perspectives*, 14 (4), pp.141-64.

[116] Mansen, M. (1993), The Allocation of Consumption by married couple families in the U.S.: An Analysis Conditioning on Labor Supply, *Annales d'Economie et de Statistique*, 29 (1), pp. 83-108.

[117] Martin, Linda G., J. Trussell, Florentina R. Salvail, and Nasra M. Shah (1983), Co-variates of Child Mortality in the Philippines, Indonesia, and

Pakistan: An Analysis Based on Hazard Models, *Population Studies*, 37 (2), pp. 417-32.

[118] McCarthy, Florence, Saleh Sabbah, and Roushan Akhter (1978), Rural Women Workers in Bangladesh: Problems and Prospects, Working Paper, Women's Section, Ministry of Agriculture, Bangladesh

[119] Menski, Werner (2000), Developments in Muslim Law: The South Asian Context, *Supreme Court Cases Journal*, 9

[120] Milkman, Ruth (1987), Gender at Work: The Dynamics of Job Segregation by Sex during World War II, Urbana: University of Illinois Press

[121] Mincer, Jacob and Solomon Polachek (1974), Family Investments in Human Capital: Earnings of Women, *Journal of Political Economy*, 82, pp. S76-108.

[122] Ministerio de la Presidencia, *Boletin Oficial del Estado*, selected issues

[123] Ministerio de Asuntos Sociales, *V Plan de Igualdad de Oportunidades entre Mujeres y Hombres, 2003-2006*

[124] Mroz, Thomas A. (1987), The Sensitivity of an Empirical Model of Married Women's Hours of Work to Economic and Statistical Assumptions, *Econometrica*, 55 (4), p. 765-99.

[125] Mostafa, G., K.M.A. Shaikh, J.K. van Ginneken and A.M. Sarder (1998), Demographic Surveillance System-Matlab. Registration of Demographic Events, 28; International Centre for Diarrhoeal Disease Research, Bangladesh, Scientific Report No. 82

[126] Murphy, Kevin, Andrei Shleifer, and Robert W. Vishny (1991), The Allocation of Talent: Implications for Growth, *Quarterly Journal of Economics*, 106 (2), pp. 503-30.

[127] Murthi, Mamta, Anne-Catherine Guio and Jean Dreze (1995), Mortality, Fertility, and Gender Bias in India: A District Level Analysis, *Population and Development Review*, 21.

[128] Nagel, Ilene and John Hagan (1983), Gender and Crime: Offense Patterns and Criminal Court Sanctions, in *Crime and Justice: An Annual Review of Research*, pp. 91-144, ed. by M. Torny and N. Morris, Vol. 4, Chicago: The University of Chicago Press

[129] Nihila, Millie (1999), Marginalisation of Women Workers: Leather Tanning Industry in Tamil Nadu, *Economic and Political Weekly*, April 17-24

[130] Nirmala, Annie K., and G. Parthasarthy (1999), Marginalisation Hypothesis and Post Green Revolution Period, in *Gender and Employment in India*, ed. by Alakh N. Sharma and T. S. Papola, Delhi: Institute of Economic Growth

[131] Özler, Berk, Gaurav Datt, and Martin Ravallion (1996), A Database on Poverty and Growth in India, Washington: World Bank

[132] Pande, Rohini (2003), Can Mandated Political Representation Provide Disadvantaged Minorities Policy Influence? Theory and Evidence from India, *American Economic Review*, Vol. 93(4), pp.1132-1151

[133] Parisi, Nicolette (1982), Are Females Treated Differently? A Review of the Theory and Evidence on Sentencing and Parole Decisions, in *Judge, Lawyer, Victim, Thief*, pp. 205-20, ed. by N. Rafter and E. Stanko, Boston: Northeastern University Press

[134] Phelps, Edmund S. (1972), The Statistical Theory of Racism and Sexism, *American Economic Review*, 62, pp. 659-61.

[135] Phillips, James F., Ruth Simmons, Michael A. Koenig, and J. Chakraborty (1988), Determinants of Reproductive Change in a Traditional Society: Evidence from Matlab, Bangladesh, *Studies in Family Planning*, 19 (6), pp. 313-34.

[136] Preston, Jo Anne (1999), Occupational Gender Segregation: Trends and Explanations, *Quarterly Review of Economics and Finance*, 39 (5), pp. 611-24.

[137] Pritchett, Lant, and Lawrence H. Summers (1996), Wealthier is Healthier, *Journal of Human Resources*, 31 (4), pp. 841-868.

[138] Putnam, Robert D. (2000), Bowling Alone: The Collapse and Revival of American Community, New York: Simon and Schuster

[139] Rahman, M (1986), Tradition, Development, And the Individual. A Study of Conflicts and Supports to Family Planning in Rural Bangladesh, ed. by Penny Kane and Lado Ruzicka; Asian Population Change Series No. 1, Department Of Demography, Australian National University, Canberra

[140] Rahman, Abdur (1989), Women in Shari'ah, London: Ta-Ha Publishers Ltd

[141] Rahman, M.Omar, Jane A. Menken, Andrew Foster, Christine E. Peterson, Mohammed Nizam Khan, Randall Kuhn and Paul Gertler (1999a), The 1996 Matlab Health and Socioeconomic Survey: Overview and User's Guide, DRU-2018/1, RAND, Santa Monica CA

[142] Rahman, M.Omar, Jane A. Menken, Andrew Foster, Christine E. Peterson, Mohammed Nizam Khan, Randall Kuhn and Paul Gertler (1999b), The 1996 Matlab Health and Socioeconomic Survey: Questionnaires for Household Survey, DRU-2018/2, RAND, Santa Monica CA

[143] Rajaraman, Indira (1983), Economics of Bride-Price and Dowry, *Economic and Political Weekly*, February 19

[144] Rajna, P.N., Ajay Kumar Mishra, and S. Krishnamoorthy (1998), Impact of Maternal Education and Health Services on Child Mortality in Uttar Pradesh, India, *Asia-Pacific Population Journal*, 13 (2).

[145] Rao, Vijayendra (1993), The Rising Price of Husbands: A Hedonic Analysis of Dowry Increases in Rural India, *Journal of Political Economy*, 101

[146] Rao, Vijayendra (2000), The Marriage Squeeze Interpretation of Dowry Inflation: Response, *Journal of Political Economy*, 108 (6), pp. 1334-5.

[147] Reskin, Barbara F., and Patricia A. Roos (1990), Job Queues, Gender Queues: Explaining Women's Inroads into Male Occupations, Philadelphia: Temple University Press

[148] Rogg, Elisabet (2003), Gender Revolution in Science, KILDEN article

[149] Rosen, Sherwin (1974), Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition, *Journal of Political Economy*, 82 (1), pp. 34-55.

[150] Rosen, Sherwin (1982), Authority, Control, and the Distribution of Earnings, *Bell Journal of Economics*, 13 (2), pp. 311-23.

[151] Rozario, S. (1992), Purity and Communal Boundaries: Women and Social Change in a Bangladeshi Village, London: Zed

[152] Seguino, Stephanie (2000), Gender Inequality and Economic Growth: A Cross-Country Analysis, *World Development*, 28 (7), pp. 1211-30.

[153] Sen, Amartya (1999), Development as Freedom, New York: Random House

[154] Shaikh, Kashem (1998), The Social and Demographic Correlates of Divorce in Rural Bangladesh, *Asia-Pacific Population Journal*, 13 (3).

[155] Sheel, Ranjana (1999), The Political Economy of Dowry: Institutionalization and Expansion in North India, New Delhi: Manohar

[156] Simmons, Ruth (1996), Women's Lives in Transition: A Qualitative Analysis of the Fertility Decline in Bangladesh, *Studies in Family Planning*, 27 (5), pp. 251-68.

[157] Srinivas, M. N. (1957), A Note on Sanskritization and Westernization, *Far Eastern Quarterly*, 4 (15), pp. 481-96.

[158] Strober, Myra H. (1984), Towards a General Theory of Occupational Sex Segregation: The Case of Public School Teaching, in *Sex Segregation in the Workplace: Trends, Explanations, Remedies*, ed. by Barbara F. Reskin, Washington: National Academy Press

[159] Tam, Tony (1996), Reducing the Gender Gap in an Asian Economy: How Important is Women's Increasing Work Experience?, *World Development*, 24 (5), pp. 831-44.

[160] Tambiah, Stanley J. (1973), Dowry and Bridewealth and the Porperty Rights of Women in South Asia, in *Dowry and Bridewealth*, ed. by Jack R. Goody and Stanley J. Tambiah, Cambridge Papers in Social Anthropology, No. 7, Cambridge: Cambridge University Press

[161] Thomas, D. (1993), The Distribution of Income and Expenditure within the Household, *Annales d'Economie et de Statistique*, 29 (1), pp. 109-135.

[162] Topel, Robert (1999), Labor Markets and Economic Growth, in *Handbook of Labor Economics*, ed. by Orley Ashenfelter and David Card, Amsterdam: North Holland

[163] Treiman, D. J., and H. Hartman (Eds.), (1981), Women, Work, and Wages: Equal Pay for Jobs of Equal Value, Washington: National Academy Press

[164] Tzannatos, Zafiris (1992), Potential Gains from the Elimination of Labor Market Differentials, in *Women's Employment and Pay in Latin America, Part 1: Overview and Methodology*, Regional Studies Program Report No.

10, ed. by George Psacharapoulos and Zafiris Tzannatos, Washington: World Bank

[165] Ulku-Steiner, Beril, Beth Kurtz-Costes and C. Ryan Kinlaw (2000), Doctoral Students Experiences in Gender-Balanced and Male-Dominated Graduate Programs, *Journal of Educational Pyschology*, Vol. 57, pp. 296-307.

[166] United Nations Development Program (2000), Human Development Report, United Nations

[167] Wooldridge, Jeffrey M. (2001), Econometric Analysis of Cross Section and Panel Data, Cambridge, Massachussets: The MIT Press

[168] World Bank (2001a), Engendering Development: Through Gender Equality in Rights, Resources, and Voice, Washington: World Bank

[169] World Bank (2001b), World Development Indicators, Washington: World Bank

[170] World Bank (2005), World Development Indicators, Washington: World Bank

[171] Yalman, N. (1967), Under the Boo Tree, California: University of California Press

[172] Yasmin, Lailufar (2000), Law and Order Situation and Gender-based Violence: Bangladeshi Perspective, RCSS Policy Studies No. 16, Regional Centre for Strategic Studies, Sri Lanka

[173] Zhang, Junsen, and William Chan (1999), Dowry and Wife's Welfare: a Theoretical and Empirical Analysis, *Journal of Political Economy*, 107 (4)