

# Individual vs. Social Motives in Identity Choice: Theory and Evidence from China\*

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## Abstract

This paper studies how individual and social motives shape identities and applies it to the ethnicity choice for children in ethnically mixed marriages. Our theoretical framework highlights the interaction of material benefits, identity costs, and social reputations. It is consistent with two motivating facts for ethnic choices in China, and delivers a set of auxiliary predictions. In particular, due to the interplay between the stigma and the honor of breaking and following prevailing norms, social motives should crowd in (out) changes in material motives in localities where the shares of children that follow the mother's ethnicity is small (large). Empirical tests on Chinese microdata find support for this and other predictions. The estimated effects are quantitatively important and statistically robust. Various alternative theoretical and empirical explanations, including changes in bargaining power, may shed light on the pattern of ethnic choices, but they cannot explain our main finding on the interplay between individual and social motives.

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# 1 Introduction

In this paper, we ask how material benefits, intrinsic costs, and social norms interact in shaping the choice of ethnic identity. Specifically, we study theoretically and empirically how parents in ethnically mixed marriages choose the ethnicity of their children. Confronting our theoretical predictions with microdata from Chinese censuses, we find robust empirical support that social motives strongly modify the effects of individual motives on choice. These results are certainly quite specific to ethnic choices in China, but they also speak to a more general question in the social sciences.

**The general issue** In theoretical and empirical work, economists typically consider how *individual*, most often material, motives shape individual decisions and market phenomena. By contrast, sociologists and social psychologists mainly consider how *social* motives shape individual decisions. To caricature and quip: economists still mainly think about how individual decisions drive social outcomes, while sociologists still mainly think about how social outcomes drive individual decisions. So what, the reader may ask – these approaches may both be valuable and reflect an effective division of labor in the social sciences. Even though this may be true, the division of labor may also leave important issues falling in the cracks between different disciplines.<sup>1</sup>

The interaction between individual and social motives is one such issue. Many individual economic, political or social choices involve both types of motives: these include not only choices of identity, but also choices regarding tax compliance, political participation, and fertility, to name a few. Suppose the government intervenes to encourage a certain choice, by modifying some individual motive that it can influence. Do the social motives help or hinder that intervention? Put differently, are the stronger individual motives crowded in or crowded out by social motives?

We know little about this general question. One reason is that most analyses of individual and social motives assume the answer *a priori*. Suppose a certain choice for material gain – say, avoiding to pay your taxes – is perceived as an antisocial choice. It is then common to assume that the stigma of this choice decreases if more individuals break the norm, which appears very reasonable. However, if this were the only social motive, individual decisions become complements, such that social motives always crowd in individual motives. But that would ignore the possibility that not pursuing the material benefits becomes more honorable when more individuals break the norm. Such a concern for social honor creates a substitutability. If both concerns are present and the honor dominates the stigma, social motives crowd out

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<sup>1</sup>Of course, there is a growing literature in economics on individual choices and social interactions. See e.g., Brock and Durlauf (2001) and Blume et al (2011) for discussions of the general issues of the economics and econometrics of social spillovers in that literature. There is also a related (and older) literature in sociology, called economic sociology. See Smelser and Swedberg (2005) for an exhaustive survey. To the best of our knowledge, none of these literatures have addressed the general issue we focus on here, namely the how individual and social motives interact to shape individual choices.

material benefits.<sup>2</sup>

**Our stepping stone** To better understand the different possibilities, we take a stepping stone in a framework first formalized in Benabou and Tirole (2011), which allows for both complementarity and substitutability in individual decisions. This framework recognizes that there may be a social stigma associated with breaking a prevailing social norm, as well as a social honor associated with following it. The interaction between stigma and honor influences the social reputation tied to different individual choices, and decides whether these are substitutes or complements: they are complements when the number of people making the antisocial choice fall below a certain cutoff, and substitutes otherwise.

**Our application** Our specific question is how material motives entailed in government policies, individual attitudes, and social motives jointly shape ethnic choices. China is an interesting testing ground to study family ethnic choices for several reasons. First, it is a multiethnic society with 55 officially recognized ethnicities beyond the dominant Han (about 91.5% of the population). Second, mixed ethnic couples are free to choose whichever of their two ethnicities for their children at birth and we can observe these choices at the individual level in China’s micro data. Third, the central government has given policy favors to minorities in the areas of family planning and education that vary by provinces.<sup>3</sup> Finally, the clear prosocial norm in China’s patriarchal society is to choose father’s ethnicity for the children. These circumstances allow us to study empirically how the interplay between social stigma and honor may modify the effects of changing material motives on ethnic choices.

For convenience, throughout the paper we refer to a mixed couple with a Han man and a Minority woman as Han-Minority and one with a Minority man and a Han woman as Minority-Han. To discipline our theoretical analysis, we take a starting point in two facts on the ethnicity of children, which stand out in both aggregate and individual-level data. Labeled F1 and F2, these facts are described in Section 2.

**Our theoretical analysis** Against this background, our paper studies ethnic choices in China in theory and data. Theoretically, we set up a model for the choice of ethnicity for children that is consistent with F1 and F2. Building on Benabou and Tirole (2011), we formulate a model of the interplay between individual and social motives. Mixed couples make decisions on their children’s ethnicity based on three interacting motives: material benefits (from policies favoring minorities), individual intrinsic costs (from picking an ethnicity against the norm of following

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<sup>2</sup>Field or lab experiments have documented crowding-out like effects in different contexts. One example is Gneezy and Rustichini’s (2000) study of fines for late pickup in Israeli daycare centers, another is Fehr and List’s (2004) study of how fines may crowd out voluntary contributions. See Gneezy, Meier and Rey-Biel (2011) for an overview.

<sup>3</sup>These policies vary at the province level by law. This is not to say that there cannot be variation across more local levels (e.g., prefectures) due to different implementation. However, our focus is on how ex ante ethnic policies shape people’s choices, in which case it seems reasonable to focus on provincial-level policies.

father’s ethnicity), and social reputations (depending on choices by other mixed couples in a peer group).

Having shown that the model implies facts F1-F2, we derive a set of new predictions that can be empirically tested with the Chinese microdata. The key prediction is that giving the child the mother’s identity – the antisocial choice – should be complements (substitutes) leading to crowding in (crowding out), when the share of mixed couples who make this choice is below (above) a certain cutoff. Under that condition, concerns for social stigma (of following mother’s choice) dominates concerns for social honor (of following father’s ethnicity).

**Our empirical analysis** Consistent with our model predictions, the ethnicity of children in Minority-Han families varies little in the data. Therefore, we focus empirically on the ethnicity of children chosen by Han-Minority families. To test the key theoretical prediction we exploit the variation across prefectures (a lower administrative level under provinces) in the share of such families that give their mother’s identity to their children.

There are three empirical challenges to carry out this test. One is how to measure material benefits tied to policies favoring minorities. Since ethnic policies appear in a bundle of provincial regulations, it is not straightforward to quantify their regional variation over time. To ensure that our results are robust, we use three measures: the rollout of the one-child policy, additional fertility rates for minorities (relative to Han), and additional scores for minorities in college entrance exams.

A second challenge is that individual and aggregate ethnic choices in the relevant peer group may be simultaneous, leading to an instance of the reflection problem (Manski 1993). To avoid this problem, we define the share of children following their mother’s identity by the choices in cohorts born already in 1970-74 in the same prefecture. This leads naturally to a difference-in-differences specification: the initial share becomes an *ex ante* classifier of social concerns, and we compare the impacts of ethnic policies in regions with low 1970-74 shares and in regions with high 1970-74 shares.

A third challenge is omitted variables. First, ethnic policies may be correlated with other variables that also affect ethnic choices. To rule this out, we include pre-trends in our analysis and show that changes in ethnic choices occur only after the implementation of the ethnic policies. Second, the identifying variation in the pre-policy share of children following their mother’s ethnicity may be systematically related to the change in ethnic policies. To rule this out, we collect a set of regional characteristics and allow them to have different impacts before and after the introduction of the ethnic policies.

**Our empirical results** Using individual census data from 1982 to 2005, we document that policies raising the material benefits of minority children are indeed associated with an increase in the share of children following the mother’s (minority) ethnicity in Han-Minority families. Estimates with the aforementioned difference-in-differences specification confirm that the effect

of ethnic policies is larger in prefectures with a share of children following mother’s ethnicity below a certain cutoff. We show that the key result is robust to statistical checks for pre-trends, to outliers, to the shares of Han-Minority mixed marriages in the prefecture, to alternative definitions of peer groups, and to possible biases from migration. We know of no earlier empirical work – on this topic or others – that arrives at such results regarding the interaction between individual and social motives.

As a sanity check on the model that delivers our main prediction, we also test an additional theoretical prediction, on the interaction effect between material benefits and intrinsic identity costs. Exploring information on children’s gender and wife’s religion, we find that this prediction is also supported by the data.

**Alternative explanations** Could other drivers than individual-social interactions explain the empirical patterns we uncover in the data? We discuss in detail several theoretical and empirical alternatives: different preference specifications, different definitions of social reputations or of peer groups, changing bargaining power of women, a kind of censoring, and changes in the number of children. While we find that some of these alternatives may contribute to the changing ethnicity of children to mixed couples, as summarized in facts F1 and F2, none of them changes our main empirical results on the interaction between individual and social motives.

**Relation to other research** Our study provides a new perspective on identity choice. Sociologists and political scientists have contributed to the understanding ethnic identity earlier than economists. While that literature is too large to survey here, an example is the pioneering research by Bates (1974) and Vail (1989) on the role of ethnic identity and tribalism in Africa. Existing economic studies suggest different determinants of identity. Some of them show how social and intrinsic motives can support persistent choices (Akerlof and Kranton 2000, Bisin and Verdier 2000, Bisin, Topa and Verdier 2001, Fernandez and Fogli 2006), while others show how material incentives can create individual motives for identity change (Botticini and Eckstein 2007, Cassan 2015, Nix and Qian 2015).<sup>4</sup> As far as we know, ours is the first empirical analysis based on individual-level data to study the interplay between individual and social motives when identity is a choice.

Our findings add to the few existing studies of ethnicity in China by sociologists. Relying on the 1-percent sample of the 2000 census and treating both types of mixed marriages equally, Guo and Li (2008) document find an average probability of having a minority child of more than one half. This is true in our data and our model can also explain the asymmetry between the two types of mixed marriages. We know of no existing research that has analyzed ethnic decisions in China from a rational-choice perspective. Our paper tries to fill the gap. Some variables we

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<sup>4</sup>Between these two lines, a few studies investigate the historical determinants of ethnicity (see Michalopoulos (2012) for an example). Such studies also argue for persistence of ethnicity even though the determinants are generally related to material incentives.

explore to test our theory and alternatives to it – such as the rollout of one-child policy and sex ratios – have been widely used in other contexts (Ebenstein 2010, Wei and Zhang 2011, Edlund et al. 2013, Huang 2016). We also provide additional measures of ethnic policies such as extra scores for minorities to this literature.

Some economists (e.g., Alesina and La Ferrara 2005) have argued that ethnic diversity plays an important role in development and, as mentioned, political scientists have studied how identification with ethnic groups became an important way to channel claims on the state in new African postcolonial nations. Our focus is on ethnic choices themselves, rather than their economic and political consequences. But by asking how individuals respond to preferential policies for minorities, we provide a micro perspective on the political economy of ethnicity in China, where the regime has used ethnic policies to raise its legitimacy among minority groups (Sautman 1998).<sup>5</sup>

By allowing either crowding in or crowding out – rather than postulating the outcome *a priori* – we also add to the research on how social motives modify individual choice in contexts beyond identity.<sup>6</sup> One can apply our method to estimate the interaction of individual and social motives to the wide set of individual choices in the economic, political or social arena, where individual and social motives both play a substantial role. Subsequent to the first version of this paper, Besley, Jensen and Persson (2015) use an extension of the Benabou-Tirole model to derive predictions for an empirical study of the evasion from local property taxes in the UK. But these authors focus on other issues and use aggregate (council-level) rather than individual data. Joensen and Skyt Nielsen (2015) also use the Benabou-Tirole model to set up an empirical analysis based on individual data of the choice of Math and Science majors among girls and boys in Denmark.

**Organization of paper** The next section of the paper presents facts F1 and F2 and describes the relevant institutional background to our study. Section 3 formulates our model and spells out its predictions. Section 4 discusses which data can be used to test them. Section 5 demonstrates that the main predictions are consistent with these data. Section 6 discusses alternative explanations for the patterns in the data and whether these explanations drive our main result. Section 7 provides a brief conclusion. To save space, we relegate some additional modeling, tables and figures to an (Online) Appendix.

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<sup>5</sup>Sautman (1998) discusses why China’s ethnic policies represent a case that does *not* confirm to the hypothesis of Thomas Sowell and other scholars that affirmative action everywhere creates inter-ethnic tensions.

<sup>6</sup>See Bowles and Polania-Reyes (2012) for a thorough survey of fifty experimental studies that document that economic incentives and social preferences are substitutes or complements in different experiments.

## 2 Background

China has 56 ethnic groups, the dominant Han plus 55 minorities. As of 2000, the combined population of minority groups stood at about 106 million, 8.5% of the total mainland population. The 55 minority groups vary widely in size. With a population of more than 15 million (in 2000), the Zhuang is the largest one and the Lhoha, with only 2,965, the smallest. Minority groups also vary greatly in culture, spoken language and religious practice – 53 minority groups speak languages of their own, 23 have their own written language, 10 groups are predominantly Muslim, and eight follow Tibetan Buddhism. Some minority groups, like the Uighurs, look physically very different from Han Chinese, while other groups look broadly similar to the Han.

**Two salient facts on ethnic choices** We now point at two empirical facts on the ethnicity of children in mixed couples, which we will use to discipline the theoretical analysis.<sup>7</sup> The first fact is:

**F1** *The share of children that have their mother’s ethnicity is much higher in Han-Minority families than in Minority-Han families.*

Figure 1 panel (a), plots these shares over time in the aggregate data, by five-year birth cohorts, for the two types of mixed marriages. On average, the probability that children follow their mother’s ethnicity in Minority-Han and Han-Minority families are 6% and 47%, respectively. Naturally, these aggregate patterns can be confounded by regional characteristics and time trends. However, as shown in Appendix Table A1, differences of the same magnitude hold also at the individual level, as we control for prefecture fixed effects, birth-year fixed effects and province-specific trends (province fixed effects times birth year).<sup>8</sup>

The second fact is:

**F2** *The share of children with their mother’s ethnicity is increasing in Han-Minority families after 1980.*

This pattern is clearly shown by panel (a) of Figure 1. At the aggregate level, the average share of children in Han-Minority families following their mother’s (Minority) ethnicity is 41% in cohorts born before 1980 but 49% in cohorts born after 1980. Panel (b) further shows that this pattern holds at the individual level (after controlling for prefecture fixed effects and province-specific trends).<sup>9</sup> Differently, we observe little change in the choices by Minority-Han families.

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<sup>7</sup>We use the 1982, 1990, 2000 censuses and the 2005 mini-census. Our analysis focuses on the children born between 1970 and 2005. See Section 4 for more detail on data structure and availability.

<sup>8</sup>Column (1) in Table A1 compares the probability of minority for a child in Minority-Han families and that for a child in Han-Minority families. Similar to the aggregate pattern, the difference is around 47 percentage points. Columns (2) and (3) present the results after including prefecture fixed effects and birth year fixed effects. Column (4) further allows for provincial-specific trends. The estimates are very similar to those in column (1).

<sup>9</sup>Appendix Table A2 presents estimation results at the individual level. Columns (1)-(3) show the results for Han-Minority families and columns (4)-(6) for Minority-Han families. The results in columns (3) and (6) are visualized by the solid line and the dashed line in panel (b) of Figure 1.

The aggregate data seem to suggest a slight increase in the average share of children following their mother’s (Han) ethnicity, but this change is not significant in the individual data once we control for province-specific trends (see the shaded area in panel (b)). If anything, the trend is weakly decreasing at the individual level until the 1990s.

## 2.1 Benefits and Costs of a Minority Child

**Anecdotal evidence** Little research exists on ethnic choices for children in China. However, one finds numerous discussions online among parents, reflecting the benefits and costs of choosing ethnicity for their children.

One example of a suggestive discussion [in our own translation from Chinese] appears at the website *babytree.com* – see Appendix Figure A1(a) for the original discussions:

*Anonymous* asked: “If the father is a Han and the mother is a minority, could the child be a minority?”

*Linyibaobeixuan* answered: “Generally should follow the father’s. But following the mother’s has the benefits of ethnic favors.”

*Yuer2011* answered: “The child usually follows the father’s ethnicity. It is also fine if you insist on following the mother’s.”

*Sankouzhijiatu* answered: “The child should follow the father’s ethnicity. Only the children of a live-in husband will follow the mother’s.”

*Xixi1011* answered: “You can follow the mother’s. A minority has the option of having a second child.”

This dialog suggests that material benefits due to ethnic policies, especially the option of having a second child, once a minority child grows up, are considered motives for following the mother’s ethnicity in Han-Minority families. The costs of having a minority child are primarily social and intrinsic: the prosocial norm is that children should follow the fathers’ ethnicity and it is costly for a father to have a child following mother’s ethnicity. For instance, a Han man with a Minority child (following his wife’s ethnicity) may be stigmatized – as the wife usually goes to live in the husband’s family, only lower-status men will consider becoming live-in husbands.

This first example thus illustrates the social stigma side, in that men with children of a different ethnicity can be considered of low social status.

Another illustrative discussion [also in our own translation from Chinese] is found at the website *jzb.com* (the meaning of *jzb* in Chinese is parents’ helper) – see Appendix Figure A1(b) for the original discussions:

*Zhongermen* said: “I went to register the birth of my child a while ago. I am a Han man and my wife is a minority. I told the police that I want my child to be a Han. The police kindly suggested that I should choose minority for the child. She



said that one score lower implies an extra playground of competitors in the high-school entrance exam and that I should be responsible for my child's future. But I insisted on choosing Han in the end. I hope that my child's future will rely on his own ability, not ethnic favors."

*fh2315* remarked: "Choosing minority is not a big deal if the minority does not practice religion."

*clactitia* remarked: "Well, if you despise the ethnic favor for extra scores, minorities can at least have more children!"

*Magua* remarked: "I am a minority and my child follows my ethnicity. The reason is simple. Even though I belong to a minority group whose population size is large, I am proud of my ethnicity. So I hope that my child is also [proud of my ethnicity]. This has nothing to do with extra scores."

Once again, these arguments reflect the tradeoff between material individual benefits and intrinsic or social motives when choosing ethnic identity for children. But this example illustrates the social honor, rather than the social stigma, side. For instance, the Han man who starts the discussion feels honorable to assign his ethnicity for his child despite the ethnic favors toward Minority. The last commentator argues that he chooses his own ethnicity for his child because he is proud of his ethnicity and hopes the child will share this pride. Our theoretical framework in the next section will focus on the interplay between social stigma and social honor.

Next, we describe the ethnic policies embodied in these discussions.

**Ethnic policies and our measures** No legal barriers exist for mixed marriages between any two ethnic groups. At the birth of their child, a mixed married couple has to choose one of their own ethnicities for their children. Along with name and birth date, the ethnic identity appears in almost every context, including the birth certificate and all the forms which have to be filled out at school. As a result, the chosen ethnicity can be thought of as public information to peers.<sup>10</sup> Choosing minority identity brings both benefits and costs for the child, and hence indirectly for the parents.<sup>11</sup>

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<sup>10</sup>As already suggested by the data, ethnic choice is more than labelling. If this choice were purely a label, parents would all have chosen minority for the preferential policies. Among the very few studies on the socialization of children in mixed marriage, Li (2008) interviews a small number of children in Xinjiang and documents a correlation between ethnic choice and the socialization of children.

<sup>11</sup>According to government regulation, couples with the same ethnicity cannot choose any other ethnicity for their children. Regarding switches later in life, children from mixed marriages can apply to change their ethnicities given at birth before the age of 20. However, the applications have to be made by the parents for those younger than 18. Since these applications are costly and approval is uncertain, the impact of policy interventions on switches later in life should be much less important than the ethnicity choices by parents at the birth of their children. There are no systematic data available to shed light on this. As an indirect check, we examine the correlation of ethnicities by prefecture-birth year across censuses. For instance, the correlation for the 1982 and 1990 samples is around 0.96, suggesting that switching ethnicities cannot be very frequent.

**Benefits of minority children** The benefit side comes from various ethnic policies. Since the beginning of the People’s Republic of China (1949-), the government has employed different policies to the benefit of ethnic minorities to promote positive Han-Minority relationships. Such policies exist in three areas:

(i) *Family planning.* When family-planning policies started in the 1960s, minorities were more favorably treated than the Han majority. Over time, there has also been some regional variation in the treatment of different minorities. As detailed in Section 4, family-planning policies became much more stringent in the years around 1980 with the implementation of the one-child policy, rendering the advantages of minorities more salient. Relaxed family planning is the most sought-after benefit by China’s minorities (Sautman 1998). Note that in this realm of policy, giving the children Minority ethnicity mostly provides an option value, as the benefits can only be drawn if the Minority child marries another Minority in most cases.

In our analysis, we use two measures for family planning: one is on the rollout of family planning policies across provinces; the other is the completed fertility ratio of minority vs. Han mothers (aged 40 and above). Section 4 describes our measurement in detail.

(ii) *Entrance to higher education.* Since the restoration of entrance exams in 1977, minorities have enjoyed additional points in the exams that decide upon the entry to different levels of education, especially high school and college. These benefits also vary by province. Unlike the family policies, they apply with certainty to the child, conditional on applying for admission to higher education.

In our analysis, we measure this benefit by average extra scores for minorities by province in the National College Entrance Exam. Once again, Section 4 details the data and measurement.

(iii) *Employment.* The national ethnic policy states that minorities should have favorable treatment in employment. However, explicit benefits for minority employment are rare. As minorities can be discriminated in employment, it is unclear that this policy would make people tend to choose Minority identity for children. For instance, Hasmath and Ho (2015) find that minorities perceive that they are at a disadvantage in the job search process, even though estimated Han-Minority wage differentials demonstrate little evidence for ethnic minority disadvantages.

**Costs of minority children** The cost side of having minority children has two aspects.

(i) *Discrimination.* Minorities may face discrimination in the labor market, even when they have the same educational background as Han. However, this cost may be less critical as minorities have a higher chance of receiving higher education due to the ethnic policies. At the birth of a child, these benefits are likely to dominate the potential discrimination costs in the labor market. This is consistent with the anecdotal discussions, where discrimination in the labor market is never mentioned when the parents are making ethnicity choices for newborns. It is also consistent with the fact that almost all Minority-Han couples choose minority (i.e., follow the father’s ethnicity) for their children – one would expect to see more Han children if discrimination played a dominant role. In any case, our model below has a basic level of net

material benefits, which can be positive or negative; what matters for our predictions is the increase in these net benefits in connection with the family-planning and education policies.<sup>12</sup>

(ii) *Identity costs.* As highlighted by the anecdotal discussions, a main disadvantage of having a minority child for Han-Minority families is an identity cost, especially for Han fathers. In a patriarchal society such as China, children are expected to follow the ethnicity and family name of the father.<sup>13</sup> Additionally, the identity cost are likely to be affected by prevailing social norm, and the choices of a relevant peer group. Therefore, a Han man will face a trade-off between material benefits (on behalf of the child) and social status. By contrast, the problem for a Minority father does not involve a trade off: having a child of is own ethnicity does not only bring material benefits to the child, but is also the prevalent social norm in society.

Based on these considerations, our model incorporates three different motives: individual material benefits, intrinsic benefits or costs, and social reputations. We will also build in the asymmetry for Han and Minority men. Before presenting the model, we describe the patterns of mixed marriages and the number of children across marriages.

## 2.2 Mixed Marriages Patterns

**Different marriage types** To be sure, entering into a mixed marriage is a subject of choice. Among married couples appearing in all four censuses, 17% of Minority men marry Han women, while 18% of Minority women marry Han men. This gender difference is much less striking than the corresponding difference in US black-white marriages, where 6% of black men marry white women while 2.9% of black women marry white men around 2000 (Fryer, 2007).

Appendix Table A3 shows patterns of four types of marriages, as well as education and age differences between husband and wife. Compared with couples of the same ethnicity, education differences among mixed couples are slightly lower, suggesting a bit more assortative matching in the education dimension. The age difference between husband and wife does not differ substantively across marriage types.

**Variation over time and space** The probability of mixed marriage has changed over time and also varies across regions. For instance, the probability to marry a Han man for Minority women born in the 1940s (and hence married in the 1960s) was 15%, whereas it went up to 21% for Minority women born in the 1970s (and hence married in the 1990s). This hike is likely correlated with ethnic policies favoring minority children – no specific policy favors mixed marriages as such during the period we study, but the benefits for children affect the “continuation value” for mixed marriages. Huang and Zhou (2015) argue that the one-child policy has raised

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<sup>12</sup>If changes in discrimination would coincide in time with the discrete changes in policies we consider, this might be an alternative explanation for the results we uncover. Although very little research exists on minority discrimination in China, Hansmath and Ho (2015) do provide some evidence on labor-market discrimination, which does not suggest any discontinuities, however.

<sup>13</sup>The link between family name and ethnicity is not very close for most of China’s ethnic minorities. Therefore, it is difficult to build an empirical strategy upon family names as a source of variation.

the probability of mixed marriages in China. An increase in mixed couples induced by ethnic policies cannot explain the increase of children following mother’s ethnicity in Han-Minority families, however, unless the new couples are more likely to choose mother’s ethnicity for their children.

**Marriage timing** Our approach focuses on the choice of ethnicity for the children, given an earlier choice to enter into a mixed marriage. This is reasonable because – at least in China – marriage choices are generally made before having a child. The tradeoffs between material benefits and social costs in the web discussions cited above concern couples who already had their child. In our empirical analysis, we still check that our results are robust to the cohort-specific frequency of mixed marriages in the peer group. We also present results for a subsample of mixed couples married *before* the ethnic policies were introduced, among which the choice of marriage partner is very unlikely to depend on these policies.

### 3 The Model

We extend the framework in Benabou and Tirole (2011) to model the ethnicity choice for children as a tradeoff involving individual (material and intrinsic), as well as social (norms-related) payoffs. The distinctive feature is that prevailing norms imply not only a social stain (stigma) when the norm is broken but also a social esteem (honor) when the norm is followed. As illustrated by anecdotal discussions in Section 2, both stain and esteem are in the mind of parents choosing ethnicity for their children. This framework allows us to characterize the interplay between them, where individual behaviors can be either complements or substitutes, depending on the behavior of others.

As the main role of the model is to derive empirical predictions, we include only prospective determinants of ethnicity choices that can be measured – or proxied – with some degree of confidence (see Section 4). The model is certainly highly stylized. However, it is not only consistent with facts F1 and F2, but it also yields additional and testable predictions. In particular, the model clearly predicts how material benefits and social motives interact, the main issue of interest to us.

#### 3.1 Setup

Consider a region – a prefecture, to be concrete – with a continuum of households (couples) in a given cohort. There are two ethnicities  $J \in \{H, M\}$ , where  $H$  denotes Han and  $M$  Minority. Children yield the same basic benefit  $v$  for every household. Each household has a single binary decision to make: to assign mother’s ethnicity for their children,  $m = 1$ , or not,  $m = 0$ . In line with China’s social situation, we assume that (i) the choice primarily reflects the husband’s preferences (see Section 6.3 for a model of bargaining and related implications), and (ii) the

prosocial choice is to pass on the man’s ethnicity to the child. We focus on the decisions by mixed couples  $(H, M)$  or  $(M, H)$ , where the first entry is the ethnicity of the man. (Non-mixed couples are obliged to pick their joint ethnicity for their child.)

**Han-Minority mixed couples** Consider a typical  $H, M$  couple. All such couples belong to the same *peer group*. They have a preference function

$$u^{H,M} = v + (b - e(H) - \varepsilon)m + \mu E(\varepsilon | m) , \quad (1)$$

where  $b$  is the net *material individual* benefit of having a minority child. This could differ across regions or time, due to different policies favoring minority children (recall Section 2). Further  $e(H) + \varepsilon$ , is the *intrinsic individual* cost of a child different from the father’s ethnicity for the Han man (recall Section 2). Its first component is the average stigma perceived by households when their child has different ethnicity than the Han man’s – this is common and deterministic to all peer-group members, but could differ across groups. The second component  $\varepsilon$  captures the variation in intrinsic cost, the main source of heterogeneity in the model. We assume that  $\varepsilon$  is distributed across couples with mean  $E(\varepsilon) = 0$ , c.d.f.  $G(\varepsilon)$ , and continuous, differentiable, and single-peaked p.d.f.  $g(\varepsilon)$ . By these individual motives alone, households with high  $\varepsilon$  values would have a child following the father’s Han ethnicity, while those with a low value would have a child following the mother’s Minority ethnicity.

The final term in (1) captures the social motive: the household’s *social reputation* (or self image) – how the peer group views the mixed couple (or the couple views itself) – given its ethnicity decision. Taken literally, the model thus assumes that the choices of  $m$  are perfectly observable by everybody in the peer group. In reality, observability is indeed realistic since the ethnic choice follows the child through life, as discussed in Section 2. The assumption can easily be relaxed to allow for stochastic observation – in that case, one part of parameter  $\mu$  reflects the probability that  $m$  is observed.

As high-value  $\varepsilon$  households make the prosocial choice, we assume that the household’s social reputation is given by its “expected type”  $E(\varepsilon | m)$ , the conditional mean of  $\varepsilon$  of those couples in the peer group, who make the same choice as the couple. Parameter  $\mu$ , is the relative weight on this social motive. (Section 6.1 below considers alternative preference structures without social reputations, and Section 6.2 considers alternative formulations for the social reputations.)

It is useful to define the difference

$$\Delta = E(\varepsilon | m = 0) - E(\varepsilon | m = 1) . \quad (2)$$

The value of  $\Delta$  is the couple’s *gain* in social reputation within its peer group when it conforms to the norm to give the child the father’s (Han) ethnicity. In the language of Benabou and Tirole (2011), the first term is the social honor when the child is given the father’s ethnicity –

i.e., the couple makes the prosocial choice – and the second term is the social stigma when it is given the mother’s identity – i.e., the couple makes the antisocial choice.

**An equilibrium cutoff rule** With this notation, it follows from (1) and (2) that the mixed couple is indifferent about the child’s identity when

$$b - e(H) - \varepsilon_H^* = \mu \Delta(\varepsilon_H^*) . \quad (3)$$

Since social reputations depend on how other couples in the peer group behave, this equality implicitly defines an equilibrium cutoff value  $\varepsilon_H^*$ . For the marginal couple, the net individual benefit of having a child following the mother’s ethnicity (the LHS) is equal to the gain in social reputation of having a child following the father’s ethnicity (the RHS). Couples with an  $\varepsilon$  below  $\varepsilon_H^*$  follow the mother’s ethnicity and those with an  $\varepsilon$  above  $\varepsilon_H^*$  follow the father’s ethnicity. Consequently, the share of children following mother’s ethnicity in the peer group is given by  $G(\varepsilon_H^*)$ . By (3),  $\varepsilon_H^*$  is a function of  $b, e$  and  $\mu$ . Given the cutoff rule, the equilibrium gain in social reputation becomes

$$\Delta(\varepsilon_H^*) = E(\varepsilon \mid \varepsilon > \varepsilon_H^*) - E(\varepsilon \mid \varepsilon < \varepsilon_H^*) > 0 . \quad (4)$$

By definition of truncated means (of a mean-zero variable), the first term is always positive and the second term is always negative. Hence,  $\Delta(\varepsilon_H^*)$  is always positive. By the results in Jewitt (2004), the single peak of  $g$  implies that  $\Delta$  has a unique interior minimum.<sup>14</sup>

**Comparative statics** From the cutoff condition (3), we derive how the share of children following mother’s ethnicity changes with material benefits of such children  $b$ . By the implicit function theorem, we have

$$\frac{\partial G(\varepsilon_H^*(b, e, \mu))}{\partial b} = g(\varepsilon_H^*(b, e, \mu)) \frac{1}{1 + \mu \frac{d\Delta(\varepsilon_H^*(b, e, \mu))}{d\varepsilon^*}} > 0 . \quad (5)$$

Higher material benefits for minorities raise the share of children following mother’s ethnicity: the density is positive and so is the “social multiplier” – if we follow Benabou and Tirole (2011) and assume that  $1 + \mu \frac{d\Delta(\varepsilon_H^*(b, e, \mu))}{d\varepsilon^*} > 0$  (which guarantees that  $\mu$  is not large enough to create multiple equilibria). The social multiplier reflects the interaction between individual and social motives in the model and the properties of the comparative statics depend on the sign and size of  $\frac{d\Delta(\varepsilon_H^*)}{d\varepsilon}$ , i.e., how the gain in social reputation from a Han child changes with the behavior of others.

As  $\varepsilon_H^*$  rises with  $b$  more couples follow the mother’s ethnicity. Then, both the honor and

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<sup>14</sup>Note that, for the whole peer group, social reputation is like a zero-sum game: under a veil of ignorance about  $\varepsilon$ , the *ex ante* expected value of  $\mu E(\varepsilon \mid m)$  is zero (as the unconditional mean of  $\varepsilon$  is zero).

the stigma terms in (4) goes up in value. When more children follow mother’s ethnicity (i.e., fewer follow father’s), this makes a Han man’s choice of a child following his own ethnicity more honorable. At the same time, the Han man’s choice of a child following the mother’s ethnicity becomes less stigmatizing. What matters for the sign of  $\frac{d\Delta(\varepsilon_H^*)}{d\varepsilon}$  is whether the honor goes up by more or less than the stigma goes down (saying that the stigma “goes down” here and below, we mean that a negative number becomes closer to zero).

**The race between honor and stigma** Panel (a) of Figure 2 illustrates two different possibilities. Suppose first that  $\varepsilon_H^* = -\epsilon < 0$  in the left tail of the  $\varepsilon$  distribution, so the share of children following mother’s ethnicity is small. In this case, the effect on the honor is relatively small, as this is the truncated mean of  $\varepsilon$  in the whole distribution to the right of  $-\epsilon$ . But the effect on the stigma – the truncated mean of  $\varepsilon$  in the (green) tail to the left of  $-\epsilon$  – is relatively large. As the stigma of a child following mother’s ethnicity goes down faster than the honor of a child following father’s ethnicity goes up, the gain in social reputation from having a child following father’s ethnicity goes down. That is  $\frac{d\Delta(\varepsilon_H^*)}{d\varepsilon^*} < 0$ , so more people yet have children following mother’s ethnicity. In this case, the decisions of different couples are strategic complements and the social multiplier is larger than 1.

The alternative equilibrium in Figure 2 has  $\varepsilon_H^* = \epsilon > 0$  in the right tail of the distribution, where many couples have children following the mother’s ethnicity. In this case, the honor of a child following father’s ethnicity – the truncated mean in the (red) tail to the right of  $\epsilon$  – goes up faster than the stigma of a child following mother’s ethnicity goes down, so the gain in social reputation from having a child following father’s ethnicity rises, which dampens the rise in the share of children following mother’s ethnicity. That is,  $\frac{d\Delta(\varepsilon_H^*)}{d\varepsilon^*} > 0$ , decisions of different couples are strategic substitutes, and the social multiplier is smaller than 1.

Panel (b) of Figure 2 illustrates this race between honor and stigma in a numerical example with a symmetric distribution. The top graph shows that both the honor of prosocial choice goes up and the stigma of the antisocial choice goes down (its negative value comes closer to zero) with a higher  $\varepsilon^*$  and that the (positive) honor always exceeds the (negative) stigma. Moreover, the honor goes up faster when many Han-Minority families follow the mother’s ethnicity, whereas the stigma falls faster when few families follow mother’s ethnicity. This difference generates the pattern in the bottom graph, where  $\Delta(\varepsilon_H^*)$  decreases in  $\varepsilon^*$  when few children among Han-Minority families follow mother’s ethnicity but increases in  $\varepsilon^*$  when many such children follow mother’s ethnicity.

Under a relatively mild assumption on the  $\varepsilon$ -distribution, the second derivative of  $\Delta(\varepsilon_H^*)$  is everywhere positive  $\frac{d^2\Delta(\varepsilon_H^*)}{d\varepsilon^{*2}} > 0$ . Once we make that assumption, the multiplier monotonically decreases as the initial equilibrium  $\varepsilon_H^*$  (and the share of children following mother’s ethnicity) travels from low values to high values.

**Minority-Han mixed couples** In a  $M, H$  mixed couple, the preference function analogous to (1) can be written:

$$u^{M,H} = v + (1 - m)b - m(e(M) + \varepsilon) + \mu E(\varepsilon | m), \quad (6)$$

where  $e(M)$  and  $\varepsilon$  now represent the average and idiosyncratic intrinsic cost of having a child following mother's ethnicity (Han in this case), as the prosocial choice is now to pass on minority identity to the child. We specifically assume that the distribution function  $G$  for  $\varepsilon$  and the weight on social reputation  $\mu$  are the same in the two types of couples in the same locality.<sup>15</sup>

The  $M, H$  couple will have a child following mother's ethnicity when  $-(e(M) + \varepsilon) + \mu E(\varepsilon | m = 1) > b + \mu E(\varepsilon | m = 0)$ . Defining the gain in social reputation in an analogous way as before – i.e.,  $\Delta$  is the honor of following the father's ethnicity,  $\mu E(\varepsilon | m = 0)$  minus the stigma of following the mother's ethnicity,  $\mu E(\varepsilon | m = 1)$  – we can write the indifference condition for following mother's ethnicity as

$$-b - e(M) - \varepsilon_M^* = \mu \Delta(\varepsilon_M^*). \quad (7)$$

Thus, minority-Han households with  $\varepsilon$  smaller (larger) than  $\varepsilon_M^*$  will have children following mother's (father's) ethnicity. Because  $\Delta$  is always positive, it follows that  $\varepsilon_M^* < 0$ . The share of children following mother's ethnicity within this peer group is thus  $G(\varepsilon_M^*)$ .

In the same manner as for  $H, M$  couples, we can derive the comparative statics for a change in  $b$  to get:

$$\frac{\partial G(\varepsilon_M^*(b, e, \mu))}{\partial b} = -g(\varepsilon_M^*(b, e, \mu)) \frac{1}{1 + \mu \frac{d\Delta(\varepsilon_M^*(b, e, \mu))}{d\varepsilon^*}} < 0. \quad (8)$$

### 3.2 Consistency with the Motivating Facts

In this subsection, we show that the model is consistent with facts F1 and F2 presented in Section 2.

**Choices across mixed marriages – Fact F1** In terms of the model, F1 requires that (in the majority of prefectures)  $G(\varepsilon_M^*) < G(\varepsilon_H^*)$ . This follows from (3) and (7) plus the fact that  $1 + \mu \frac{d\Delta}{d\varepsilon^*} > 0$ .

The intuition is straightforward: on average, Minority men experience not only material benefits, but also intrinsic benefits and higher social reputation of a child following their own ethnicity. Compared to Han men, more of them thus choose father's identity for their children.

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<sup>15</sup>This is a strong assumption, although one can think of arguments why  $\mu$ , say, could be either higher or lower among minorities than majorities – the former may be more eager to fit in or more eager to preserve their identities. We do not pursue this issue further, however. The main argument is measurement: since proxies for  $\mu$  and the distributions of  $\varepsilon$  would be very hard to find in available data, theoretical predictions would be empirically empty.



Because  $H, M$  mixed couples trade off material benefits against intrinsic and social reputation costs, they are more likely to cross the paternal ethnic cutoff.

**The effect of material benefits – Fact F2** Expressions (5) and (8) above show how the two types of couples react to an increase in material benefits,  $b$ ? These expressions reveal that higher  $b$  raises the probability of a child following mother’s ethnicity for Han-Minority families, everything else equal, in consistency with F2. By contrast, the model predicts an opposite pattern for Minority-Han families. However, the probability of following the mother’s ethnicity is already very low, which leaves us little variation to explore statistically.

Having established consistency between our model and facts F1 and F2, we turn our interest to new predictions from the model. These are the ones we will test empirically.

### 3.3 Main Prediction

Our most important prediction concerns the interaction between individual (material) motives and social motives. We focus on the effects on Han-Minority families and state the model predictions in two alternative ways.

**Comparing high and low initial cutpoints** From (5), material benefits are crowded in by social reputation – the social multiplier  $\frac{1}{1+\mu \frac{d\Delta(\varepsilon_H^*(b,e,\mu))}{d\varepsilon^*}}$  is larger than 1 – when few people have kids following mother’s ethnicity and their ethnicity choices are strategic complements (i.e., when  $\frac{d\Delta(\varepsilon_H^*(b,e,\mu))}{d\varepsilon^*} < 0$ ). Instead, benefits are crowded out – leading to a social multiplier smaller than 1 – when many people follow the mother’s ethnicity ( $\frac{d\Delta(\varepsilon_H^*(b,e,\mu))}{d\varepsilon^*} > 0$ ). This difference between crowding in at low shares following mother’s ethnicity and crowding out at high shares is the essence of our model.

But the effect in (5) of a change in benefits also includes the density  $g(\varepsilon_H^*)$  at the cutpoint. When considering this channel, we impose the condition that the distribution of  $\varepsilon$  has (weakly) positive skew.<sup>16</sup> Specifically, we assume that the median  $\varepsilon_{50}$  (and the mean) of the distribution lies (weakly) to the right of the mode. Suppose we compare two localities with cutpoints at percentiles equidistant from – and not too far from – the median, i.e.,  $\varepsilon_{50+n}^*$  and  $\varepsilon_{50-n}^*$ . Because of the positive skew, we have  $g(\varepsilon_{50-n}^*) \geq g(\varepsilon_{50+n}^*)$ . The larger effects of material benefits due to the higher social multiplier at  $\varepsilon_{50-n}^*$  compared to  $\varepsilon_{50+n}^*$  is thus reinforced by a higher density. We can now repeat this comparison for every other twin percentile cutpoints above and below the median. Therefore, if the cutpoints in the localities we observe in the data are continuously distributed along the support of  $\varepsilon$ , we may conclude that the average effect of material benefits in regions with cutpoints  $\varepsilon_H^*$  below the median must be higher than the average effect in regions with cutpoints above the median.

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<sup>16</sup>This assumption can be weakened to say that the distribution of  $\varepsilon$  does not have too much negative skew.

Of course, we do not observe the cutpoints  $\varepsilon_H^*$  in different localities directly, only the shares of households who get children following mother's ethnicity  $G(\varepsilon_H^*)$ . However, the cutpoints and shares are one-to-one. Based on the argument above, we can therefore state:

**P1** *For peer groups who face the same increase in benefits within a province, we should see a larger effect among Han-Minority families in peer groups with a share of children following mother's ethnicity below a cutoff share close to the median, compared to peer groups above that cutoff share.*

In the data, we will evaluate prediction P1 by difference-in-differences, comparing prefectures and cohorts above and below a cutoff share of children with mother's ethnicity near the median, before and after the shift in policy.

**Comparing initial cutpoints in different quartiles** Prediction P1 relies on a comparison of the effects triggered by changing benefits above and below a cutoff share. Our discussion about the combined effect of a decreasing social multiplier and the density of a single-peaked distribution indicates that we *cannot* state P1 as a linear interaction between the initial share and the change in benefits. Essentially, when the initial share of kids following mother's ethnicity is in the left part of the distribution, an upward shift in  $\varepsilon^*$  has an ambiguous local effect due to countervailing effects of a higher density and a lower social multiplier, whereas the effect gets unambiguous for initial shares at the other side of the median.

To illustrate the ambiguity, we consider the comparative statics at different parts of the distribution of shares  $G(\varepsilon^*)$  observed in the data, say, at different quartiles of shares corresponding to different quartiles of cutpoints  $\varepsilon^*$ . Let  $\varepsilon_q^*$ ,  $q = 1, 2, 3, 4$  denote cutpoints located at the middle of the quartiles of the  $\varepsilon$  distribution. The (weak) positive skew of the distribution implies that  $g(\varepsilon_4^*) \leq g(\varepsilon_1^*)$  and  $g(\varepsilon_4^*) \leq g(\varepsilon_3^*) \leq g(\varepsilon_2^*)$ . Moreover, under the assumption that  $\frac{d^2\Delta}{d\varepsilon^{*2}} > 0$ , the first derivatives of the social multiplier are monotonically ordered as:  $\frac{d\Delta(\varepsilon_1^*)}{d\varepsilon^*} < \frac{d\Delta(\varepsilon_2^*)}{d\varepsilon^*} < 0 < \frac{d\Delta(\varepsilon_3^*)}{d\varepsilon^*} < \frac{d\Delta(\varepsilon_4^*)}{d\varepsilon^*}$ . Using these facts in (5), we obtain an alternative testable prediction:

**P1'** *Suppose all peer groups in a province experience the same increase in benefits, due to a provincial policy. Then, the effect on the probability of having children following mother's ethnicity is (i) larger in the first, second and third quartile than in the fourth quartile of the share distribution, (ii) larger in the second than in the third quartile, (iii) ambiguous when we compare the first and second quartiles, or the first and third quartiles.*

The third part of this prediction shows that we cannot use a simple linear interaction between the initial share and a policy indicator to test the theory. A cutoff in the first quartile is associated with a lower density but a higher social multiplier than a cutoff in the second quartile, and a higher social multiplier but a lower (or higher density) than a cutoff the third quartile. For this reason, assuming a linear interaction term is inconsistent with the model.

### 3.4 Material benefits and intrinsic costs

We have analyzed how higher benefits of minority children shape the probability that mixed couples choose an ethnicity for their child following the mother’s ethnicity. An additional testable prediction concerns the interaction effect of material benefits and intrinsic costs. Do the (average) intrinsic costs  $e(H)$  of children following the mother’s ethnicity alter the effect of material benefits  $b$  for Han-Minority couples? In the model, this is the interaction effect of  $b$  and  $e$  on  $G(\varepsilon_H^*(b, e, \mu))$ . Given (5), this can be written:

$$\frac{\partial G(\varepsilon_H^*(b, e, \mu))}{\partial b \partial e} = \left( \frac{dg}{d\varepsilon_H^*} - \frac{\mu \frac{d^2 \Delta}{d\varepsilon^{*2}}}{1 + \mu \frac{d\Delta(\varepsilon_H^*)}{d\varepsilon^*}} \right) \frac{1}{1 + \mu \frac{d\Delta(\varepsilon_H^*)}{d\varepsilon^*}} \cdot \frac{\partial \varepsilon_H^*}{\partial e(H)}.$$

The first multiplicative term on the right-hand side includes two effects which both depend on the cutoff value  $\varepsilon_H^*$ . The first effect is the change in the density  $\frac{dg(\varepsilon_H^*(b, e, \mu))}{d\varepsilon^*}$ , which is positive before the single peak of  $g$  and negative thereafter. The second effect is negative as the second derivative of the gain in social reputation  $\frac{d^2 \Delta}{d\varepsilon^{*2}}$  is positive; thus the social multiplier goes down as the cutoff increases. As for the second multiplicative term  $\frac{\partial \varepsilon_H^*}{\partial e}$ , we know that it is negative. That is, with higher intrinsic costs, fewer couples have kids following mother’s ethnicity. Putting these results together, we have:

**P2** *When intrinsic costs are high, material benefits have a smaller effect on the probability of children following mother’s ethnicity in Han-Minority families, as long as the share of children following mother’s ethnicity in the peer group is relatively small.*

## 4 Data and Measurement

This section discusses how to measure the variables and parameters in the model. We also provide more background information for each variable. Outcome variables and some control variables are measured at the individual level, whereas the individual and social incentives are measured at the prefecture, residency, education-group, or ethnicity level.

**Linking of data** We draw on two sources of data. The first is three of China’s censuses: the 1-percent samples of the 1982, 1990 and 2000 censuses. Our second source is the 20-percent sample of the 2005 population survey, also known as the mini-census (it also covers about 1 percent of the population). As in the model, we are interested in the husband-wife-children structure of households.<sup>17</sup> The husband or wife data draw on information about the gender of the head of household. In some cases, parents or parents-in-law of a household head or spouse cohabit with them. We drop this relatively small part of the sample, as the censuses do not

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<sup>17</sup>By the nature of the census, for families with multiple children, it is possible that we are studying only the younger ones who live with their parents and treat the older ones who do not as separate families. See Section 6.5 for a discussion of composition effect.

distinguish parents from parents-in-law in the 1982 and 1990 censuses. We can directly identify children in the 2000 census and the 2005 mini-census. The 1982 and 1990 censuses do not distinguish between children and children-in-law. To identify children in the earlier data sets, we limit ourselves to unmarried children who still live with their parents. The results we report below are robust to using the 2000 census and the 2005 mini-census only.

After linking different datasets, our sample of children in mixed marriages comprises of around 125,000 children from Han-Minority families and around 110,000 children from Minority-Han families born between 1970 and 2005. We start from 1970 because few (13%) of the children in the linked data were born before 1970, and we need a representative cohort in the initial period to define initial shares of children that following the mother’s ethnicity across prefectures.<sup>18</sup>

We focus on administrative units defined by four-digit census codes: prefectures or cities. As some areas change names and codes over time, we unify the boundaries based on year 2000 information to end up with 319 prefectures and cities in the linked data. Since over 95% of these are prefectures, we refer to all units as prefectures.

**Ethnicity outcomes ( $m$  in the model)** The censuses always report gender, birth year and ethnicity for each individual, which provides our measure of ethnicity outcomes. However, the data we have do not report household names or locations at a finer level than prefectures (or counties). As shown by the summary statistics in Table 1, 47% of children in Han-Minority families follow mother’s ethnicity, whereas only 6% do so in Minority-Han families. This is fact F1 in the introduction. The low shares following mother’s ethnicity in Minority-Han families is associated with little variation not only across time, but also across space (see Figure 3b below). This is consistent with our model predictions discussed in Section 3.2. As a result, our analysis focuses on the children in Han-Minority families.

In our analysis to follow, we take mixed marriages as given and focus on the choice of ethnicity for children. It is possible that some regions are more open to mixed marriages as well as to ethnic identity for the children. To take this into consideration, we always control for prefecture fixed effects and non-parametric province-specific trends in our econometric specifications. We also discuss whether endogenous mixed marriages could provide an alternative explanations for our main results in Section 6 and present empirical estimates which suggest that they cannot.

**Material benefits ( $b$  in the model)** Since ethnic policies generating material benefits for minority children appear in a bundle of provincial regulations (recall the discussion in Section 2), it is not straightforward to quantify their regional variation over time. To check that our results are robust, we use three measures:

**1. Rollout of the one-child policy.** Some policies like family-planning gave favorable treatment to minorities already in the 1960s. But these policies became more generous and

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<sup>18</sup>Including those born before 1970 does not alter the main results.

salient in the 1980s, when family planning was switched more strictly to a one-child policy. However, Minority-Minority couples were still allowed to have two or more children: by giving them minority status, parents could thus create an option value in their children’s future family choices.

To measure the rollout of one-child policy, we employ the timing for 27 provinces used in Edlund et al. (2013).<sup>19</sup> As explained in that paper and earlier work on family-planning policies (e.g., Peng, 1996), the one-child policy is an umbrella term for a raft of policies. Edlund et al. (2013) focus on three programs: (i) family-planning science and technology-research institutes, (ii) family-planning education centers, and (iii) family-planning associations. Since all these programs indicate the salience of one-child policy, we consider the first year that any of them was present in a province by law as the first year of one-child policy. This starting date ranges from 1976 (in Jiangsu) to 1984 (in Guangxi).

This measure has the advantage of being staggered across provinces, but the disadvantage of a binary classification that cannot distinguish potentially different material benefits across provinces. As explained in Section 2, it is also the most important ethnic policy for China’s minorities.

No evidence suggests that the rollout of the family-planning institutions is related to ethnic choices of children in mixed marriages. In the data, the  $p$ -value for the correlation between the year of adopting the instructions and the share of children that follow the mother’s ethnicity (in Han-Minority families) in the 1970-74 cohort is 0.759. We will also check empirically for pre-trends.

**2. Extra Fertility of Minorities.** To capture the intensity of the family-planning policy and its variation over provinces and time, we calculate a second measure, namely the extra fertility for minorities (relative to Han) after the rollout of the policy. This measure is allowed to differ by province and 5-year birth cohort of the mother. Specifically, we gauge (close to) completed fertility based on the number of children to Han and minority women aged 40 and above. After the policy, on average, minority mothers have 0.11 more children than Han mothers. When matching these numbers with the ethnic-choice data, we use the extra fertility in the previous 5-year cohort of mothers, which is less likely to suffer from endogeneity.

**3. Extra Scores for Minorities in the College Entrance Exam.** To proxy the variation in education benefits for minorities across provinces, we use the extra scores for minorities in the national college entrance exam in 2000. We normalize these extra scores by the cutoff score for four-year universities in a province.<sup>20</sup> Different from the time-varying measures on fertility, this measure – which ranges from 0 to 6% – is only available for the cross section of provinces. We assume it to be 0 before the introduction of the national college entrance exam (in 1977)

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<sup>19</sup>Beijing, Shanghai, Tianjin and Chongqing are not included. We thank Lena Edlund for providing this data.

<sup>20</sup>There are two cutoffs for the first-tier and second-tier universities in a province. We normalize the extra scores by the second-tier cutoff. The results are also robust to using the first-tier cutoff (since the two cutoffs are highly correlated).

and use the cross-sectional measure for whole period afterwards.

In sum, Measure 1 has staggering across provinces in its introduction, but assumes that, once introduced, the material benefit provided to minorities are the same across provinces. Measure 3 instead has cross-sectional variation after its (simultaneous) introduction, while Measure 2 has cross-sectional as well as time-series variation. We use all three measures of material benefits in our analysis. The number of observations varies slightly due to the availability of these measures, which can be taken as a robustness check for our findings.

**Peer groups for social motives (related to  $\frac{d\Delta}{d\varepsilon^*}$  in the model)** Following the discussion about crowding in or crowding out in Section 3 (the sign of  $\frac{d\Delta}{d\varepsilon^*}$ ), we measure social motives by the shares of children following mother’s ethnicity in mixed marriages. To avoid the reflection problem discovered and discussed by Manski (1993), we want to treat the social motives for a particular cohort as predetermined by previous choices in the peer group.

Because we cannot observe the relevant peer group directly and our data derive from a sample of the population, we define the peer group relevant for the social motives in different ways in the hope of avoiding biased estimates. In line with the model, where people are influenced by other people who make the same decisions, we adopt a choice-based definition of peer groups. In particular, we associate each Han-Minority mixed couples with a set of such couples in a certain location who have had the opportunity to choose the ethnicity of their children at birth.<sup>21</sup> In addition, we also allow for the possibility for a wider peer group by considering all families that can potentially make a choice of following mother’s ethnicity or not.

**1. The 1970-74 cohort in the same prefecture.** We exploit the variation across prefectures in the 1970-74 birth cohort – i.e., in the initial cohort unambiguously before the start of the dramatic changes in ethnic policies. This treats the social motives as predetermined over the period of changing policies (and also allows us to examine the dynamic impacts of social motives over time).

**2. The 1970-74 cohort in the same prefecture subdivided by residence, education, or wife’s ethnicity.** The measure in **1.** only uses ethnicity of the husband, minority status of the wife, birth cohort, and prefecture to define the peer group. But we also consider a number of finer peer groups. **A.** The first refinement is to condition also on urban or rural residence and define the peer group at the prefecture-ethnicity-cohort-residency level. Specifically, we base the distinction between urban and rural on the husband’s *Hukou* (legal residence). This measure implies smaller groups, due to the disaggregation itself and the fact that we rely on rural/urban information in the 2000 and 2005 censuses.<sup>22</sup> Hence, the number of observations in each cell

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<sup>21</sup>The prospective econometric problems of estimating the influence of unobserved peer groups in a sample from the population appear related to the biases due to measurement error when estimating peer effects for members of partially sampled networks (Chandrasekhar and Ellis, 2011).

<sup>22</sup>Rural/urban information was asked in the 1990 but not in the 1982 census, which makes it absent from the merged 1982-90 data by IPUMS. It is possible to identify it based on separate information for 1990. We choose not to do so to keep consistency with the IPUMS merged data. This also serves as a check on whether our findings

becomes smaller. **B.** One may also plausibly argue that peer groups may be formed by people with different levels of education. A second refinement is to condition on education of the father. Specifically, we base the distinction on whether he has an education corresponding to completed high-school or above. This way, we define the peer group at the prefecture-ethnicity-cohort-education level. **C.** Yet another possibility is that the relevant peer group for a Han man and minority woman of a certain ethnicity is limited to other couples where the wife has the same ethnicity. For the Han-Minority families, we consider this possibility as well by defining the peer group at the prefecture-cohort-(female)ethnicity level.

**3. All mixed couples able to make an ethnic choice in the 1970-74 cohort in the same prefecture.** All peer group definitions under 2. involve a refinement of definition 1. To check for robustness, we also consider a broader peer group, namely the share of children following mother’s ethnicity among all couples that can make such a choice (Han-Minority marriages, Minority-Han marriages and Minority marriages involving different ethnicities).

**Pre-policy variation in share of children following mother’s ethnicity ( $G(\varepsilon^*)$  in the model)** Figure 3 plots the distribution of the shares of children following the mother’s ethnicity across prefectures, in the two types of mixed families for children born in the 1970-74 cohort. It shows a great deal of variation across prefectures for Han-Minority mixed families – with a mean around 0.39 and a standard deviation of 0.33. In terms of the model, this dispersion reflects the joint distribution of parameters  $b$ ,  $e(H)$ ,  $\mu$  leading to different cutoffs  $\varepsilon^*$  and the mapping from these cutoffs into shares via distribution  $G$ . In contrast, for Minority-Han mixed families, most prefectures are concentrated at the left end, leaving little variation across prefectures. As stated before, we therefore focus on the effect of social motives for Han-Minority families.

In addition, the pattern for the Han-Minority families in Figure 3 also suggests that the likelihood for sons to follow mother’s ethnicity is lower than that for the daughters. This is consistent with our assumption below that the intrinsic identity costs for parents are higher for sons.

Figure 4 maps the spatial distribution across China of ethnicity choices by Han-Minority couples (in the 1970-74 cohort). It suggests that the social motives vary considerably across prefectures, and that this variation is not strongly geographically clustered. For instance, province fixed effects only explain about a third of the variation across prefectures.

For Han-Minority families, our model predicts a strategic complementarity  $\frac{d\Delta}{d\varepsilon^*} < 0$  for low values of the cutoff  $\varepsilon^*$  (when the share of mixed couples having kids following mother’s ethnicity is small) and a strategic substitutability  $\frac{d\Delta}{d\varepsilon^*} > 0$  for high values of  $\varepsilon^*$  (when a large share of mixed couples have kids following mother’s ethnicity). In theory, if the distribution of  $\varepsilon$  were symmetric, the sign would flip at a critical cutoff of  $\varepsilon_{50}^* = 0$ , corresponding to a share of minority kids at 0.5. But we would like to allow for a non-symmetric distribution.

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hold with the 2000 and 2005 censuses only.

Empirically, we do this in two ways. First, we check how the estimates behave as we vary the assumption about the critical cutoff in the neighborhood of 0.5, when testing Prediction P1. Second, we look at the estimates in different quartiles, testing Prediction P1’.

**Intrinsic costs ( $e(H)$  in the model)** Our first measure of intrinsic (individual) cost  $e(H)$  is whether the child is a son or a daughter. Consistent with Confucian values, the intrinsic costs of having a child with different ethnicity than the father are higher for a son than a daughter. Figure 3 suggests that these costs affect actual choices. Consequently, we examine whether the impact of material benefits on ethnic choices is smaller for sons, thus testing Prediction P2 .

Our second measure of intrinsic costs is whether the spouse belongs to a religious minority group. It is conceivable that allowing the child to follow the mother’s ethnicity, if that ethnicity is associated with a practicing religion (recall the discussion in Section 2). To clarify, this measure is essentially at the ethnic group level. Out of the 55 minority groups, 18 practice Islam or Tibetan Buddhism. We define a wife as religious if she belongs to one of these 18 minority groups. Men who marry religious women constitute a selected sample, but our question concerns how a religious wife shapes the effect of material benefits on ethnic choice for children, rather than the effect of a religious wife itself. Table 1 shows that the share of Han-Minority mixed families with a religious wife is about 19 percent.

**Other prefecture and individual characteristics** We control for a set of prefecture and individual characteristics in our analysis. At the prefecture level, we include characteristics that might affect ethnic choices, including whether a prefecture is a borderland, the minority population share in the 1982 census, the share of population with high-school education and above in the 1982 census, as well as the number of children for a minority woman (aged 40 and above) in the 1982 census. The direct level effect of these characteristics are absorbed by prefecture fixed effects. To rule out that the identifying variation in the (pre-policy) share of children following their mother’s ethnicity is systematically related to the change in ethnic policies, we allow the prefecture characteristics to have different impacts before and after the introduction of the ethnic policies (by interacting them with our measures of ethnic benefits).

We present the correlation between these characteristics and our baseline measure of social motives (pre-policy share of children following mother’s ethnicity in Han-Minority families) in Appendix Table A4. It is worthwhile pointing out that minority population share is positively correlated with the share of children following mother’s ethnicity. This shows that our results are unlikely to be driven by a diluting scarcity effect (where a larger minority population dilutes a given amount of minority benefits). We also do not expect such scarcity effects, a priori, since ethnic benefits are generally not implemented by a quota system.

At the individual level, we include education-level fixed effects and 5-year birth-cohort fixed effects for both the father and the mother. We unify the categorical education levels across censuses into four groups: 1 indicates less than completion of primary school, 2 completion of



primary school, 3 completion of secondary school (high school), and 4 some collage education or above. As shown in Table 1, the average husband has more education than the average wife. To rule out that our estimated effects are driven by omitted individual variables, we allow the impacts of these characteristics on ethnic choices to differ before and after any policy shifts.

**Migration** The variation across prefectures and provinces discussed in this section is based on residency at census time. However, residency may be different than birth place, due to migration. Only the 2000 census includes information whether an individual’s birth place coincides with her current residency (the 1982 and 1990 censuses spells out whether people lived in the same county five years ago, and the 2005 mini-census only has information on whether they lived in the same province one year ago). Based on the 2000 census, over 85 percent of individuals were born in the same county as their current residency, while 94 percent were born in the same province. Given that prefecture is the administrative level above county, these facts suggest that migration is unlikely to make a major difference for our main results. Moreover, Frijters, Gregory and Meng (2013) document that rural-urban migration did not take off until 1997. Nevertheless, we conduct robustness checks by omitting the (most recent) 2005 census from the sample, and by excluding individuals whose birth and residence counties are different. This should minimize the potential impact of migration.

## 5 Empirical Evidence for P1 and P2

The most important new prediction(s) from our model is P1 (and P1’) on the interactions between individual and social motives. To the best of our knowledge, no similar predictions have been studied in the existing literature. This section confronts that prediction with data.

### 5.1 Testing Prediction P1

Our model of the interactions between individual and social motives predicts the effect of higher material benefits to be larger in peer groups where the initial share of children following mother’s ethnicity is smaller, because individual motives driven by material benefits are crowded in rather than crowded out by prevailing social motives. Empirically, Prediction P1 relies on a comparison of the effects above and below a cutoff share.

**Main specification** To test Prediction P1, we ask whether  $\beta_b$  is positive in the difference-in-differences specification:

$$\begin{aligned}
 CME_{i,p,t} = & \beta_b I(\leq X)_p \times b_{r,t} + b_{r,t} + birthyear_t + pref_p \\
 & + ethn_g + \gamma \mathbf{X}_{i,p} + \gamma' \mathbf{X}_{i,p} \times b_{r,t} + prov_r \times year_t + \varepsilon_{i,p,t} ,
 \end{aligned} \tag{9}$$

where the dependent variable  $CME_{i,p,t}$  is a binary indicator for child  $i$  (with Han father and minority mother of ethnicity group  $g$ ), in prefecture  $p$  (belonging to province  $r$ ), and birth year  $t$ , following the mother’s ethnicity (i.e., whether she is minority).

The material benefits from ethnic policy  $b_{r,t}$  is measured in the three ways discussed in Section 4. Thus  $b_{r,t}(\text{Post Policy})$  is a dummy for whether province  $r$  has implemented the one-child policy (measured by the establishment of family-planning institutions);  $b_{r,t}(\text{Extra Fertility})$  denotes the extra fertility for minorities post the one-child policy; and  $b_{r,t}(\text{Extra Scores})$  measures the extra scores for minorities in the college entrance exam.

$I(\leq X)_p$  is an indicator for whether the peer group – according to Definition 1 in Section 4, i.e., Han-Minority families with children in the 1970-74 birth cohort in the same prefecture – has a share of children following mother’s ethnicity smaller than some critical value  $X$  between 0 and 1, which corresponds to the theoretical borderline between crowding in and crowding out. Thus, the parameter of interest  $\beta_b$  measures the interaction between material benefits and social reputations: the difference in the effect of material benefits in prefectures below and above this cutoff.

To allow for an effect of time-invariant, or slowly changing, prefecture characteristics – such as attitudes towards mixed marriages – we include prefecture fixed effects ( $pref_p$ ). To hold constant factors that affect ethnicity choices by different cohorts across China (including the average effects of post-policy material benefits), we include birth-year fixed effects ( $birthyear_t$ ). To control for time-invariant or slowly changing ethnicity-specific factors that are time-invariant or change slowly over time, we include (a set of 55) ethnicity fixed effects ( $ethn_g$ ). For example, some minority groups may have stronger preference that the child maintains the ethnicity of the man. Since we focus on the children of Han-Minority couples, these fixed effects refer to the wife’s particular minority ethnicity.  $\mathbf{X}_{i,p}$  is a the set of individual and prefecture characteristics presented in Section 4 and we include  $\mathbf{X}_{i,p} \times b_{r,t}$  to allow their impacts to change with material benefits.

Finally, we include province-by-calendar-year non-parametric trends ( $prov_r \times year_t$ ) to control for different evolutions across provinces, such as the direct effects of different provincial policies, or different evolutions of discrimination against minorities. We cluster the standard errors at the prefecture level and present those clustered at the province level as robustness check.

**Baseline results** We start with a share of 0.5 as the cutoff and  $b_{r,t}(\text{Post Policy})$  as the material benefits in Table 2A. Columns (1)-(2) of the table only include prefecture fixed effects. Column (1) shows that the average effect of  $b_{r,t}(\text{Post Policy})$  is around 0.078 – i.e., an additional 7.8 percentage points of Han-Minority couples choose to have a minority child after the introduction of the one-child policy. Column (2) presents the interaction effect of interest, on  $I(\leq 0.5)_p \times b_{r,t}(\text{Post Policy})$ , which shows that effect of material incentives is indeed significantly larger when the share of children following mother’s ethnicity is smaller than the cutoff value. The estimated

interaction effect is quantitatively large, at least on the order of the average effect in column (1). This is consistent with Prediction P1 that benefits have a larger effect in peer groups where few mixed households make the antisocial choice of giving their children the mother’s ethnicity, because this leads to a strategic complementarity (and a social multiplier above 1), rather than a strategic substitutability (and a social multiplier below 1). For example, given the estimates in column (2), the average effect of the introduction of the one-child policy is around 10 percentage points below the 0.5 cutoff and 3 percentage points above the cutoff.<sup>23</sup>

Column (3) adds the wife’s ethnicity fixed effects. Column (4) further includes birth-year fixed effects – as 82% of the variation in the policy measure is absorbed by these birth-year fixed effects, the coefficient on  $b_{r,t}(\text{Post Policy})$  is omitted from the results (but still appears in the regression). They both display a similar estimate  $\beta_b$  as in column (2). Column (5) indicates that the pattern in column (2) is little affected by including prefecture and individual characteristics and their interactions with  $b_{r,t}(\text{Post Policy})$ . Column (6) further shows that the pattern is also robust to including non-parametric provincial trends (province-by-calendar-year fixed effects). The standard errors in parenthesis are clustered at the prefecture level and those in brackets are clustered at the province level. The estimate of  $\beta_b$  is significantly different from zero, regardless of the levels of clustering. As this is also true for all the other results to follow, we only show the results for one level of (prefecture-level) clustering in the subsequent tables.

We employ two additional measures of material benefits,  $b_{r,t}(\text{Extra Fertility})$  and  $b_{r,t}(\text{Extra Scores})$ , in Table 2B. We limit ourselves to three specifications for each policy measure, namely those in columns (2), (4) and (6) of Table 2A. To facilitate the comparison, we present the impacts of a one standard deviation ( $1\sigma$ ) increase of the measures. As shown in column (1), a  $1\sigma$  increase in extra fertility is associated with a 3.4 percentage points increase in the probability of having a child following mother’s ethnicity. Columns (2)-(3) show that the difference in the impacts below and above the cutoff is in the order of the average effect. Columns (5)-(6) present the results for  $b_{r,t}(\text{Extra Scores})$ , which exhibit a similar pattern as extra fertility. Column (7) presents a horse-race specification, including both these policy measures, and shows that the impacts of these two measures are comparable.

We further examine the impacts of  $b$  for different cutoffs. Based on the same specification as in column (6) of Table 2A, Appendix Figure A2 visualizes the corresponding interaction estimates and their 95 percent confidence intervals for all cutoffs  $X$  between 0.1 and 0.9. Each estimate represents the difference in the effect of  $b_{r,t}$  on individuals in prefectures below cutoff  $X$  and those above cutoff  $X$ . For  $b_{r,t}(\text{Post Policy})$  and  $b_{r,t}(\text{Extra Fertility})$ , the positive impact is significant for all cutoff values from 0.3 and upwards; for  $b_{r,t}(\text{Extra Scores})$ , the positive impact is significant for all cutoff values from 0.4 and upwards. As discussed next, a lower point estimate at the lowest cutoffs is consistent with the model.

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<sup>23</sup>Instead of examining an interaction effect, one can also evaluate the effect of  $Post_{r,t}$  in separate samples with prefectures below and above the cutoff (the difference between the specifications is from which samples the fixed effects are estimated). The results are very similar.

**Quartile results** In Section 3, we stated the predicted effects of interacting individual and social motives in alternative way through Prediction P1', based on the behavior in different quartiles. We now consider this prediction. To do so, we replace  $I(\leq 0.5)_p$  in equation (9) with three indicators for the share of minority children in the early 1970s cohort being in one of the three first quartiles:  $I(0-0.25)_p$ ,  $I(0.25-0.50)_p$ , and  $I(0.50-0.75)_p$ . We thus leave the fourth quartile as the reference group.

Prediction P1' is confirmed by the results in Table 3, again for the peer group of all Han-Minority couples in the same prefecture, whose children belong to the 1970-74 birth cohort. Columns (1)-(3) present the estimates when the three quartile indicators are interacted with  $b_{r,t}(\text{Post Policy})$ : column (1) includes only prefecture fixed effects; column (2) adds ethnic fixed effects (for the minority wife) and birth-year fixed effects; column (3) further adds the interaction effects of prefecture and individual characteristics and province-by-calendar-year fixed effects. Columns (4)-(9) present analogous results using  $b_{r,t}(\text{Extra Fertility})$  and  $b_{r,t}(\text{Extra Scores})$  to measure material benefits. Consistent with Prediction P1', the effect of material benefits is significantly larger in the first, second and third quartile compared to the fourth quartile. Also consistent with the prediction, the point estimates for the second quartile are indeed significantly higher than that for the third quartile (a  $p$ -value smaller than 0.05 in all specifications).

As in the test of Prediction P1, these effects are large: the difference in effects of higher material benefits, say, in the first vs. the fourth quartile is on the order of the average effect estimated in Table 2. This corresponds to the theoretical prediction of a social multiplier above 1 in the first quartile – due to crowding in – and a social multiplier below 1 in the fourth quartile – due to crowding out. Another indication of a substantial variation in the social multiplier is that the estimated effect in the first quartile is everywhere larger than that in the third quartile (this relative effect is theoretically ambiguous according to Prediction P1', due to the ambiguous effect in equation (5) of a larger social multiplier and a lower density in the first quartile).<sup>24</sup>

## 5.2 Robustness

This subsection considers whether our baseline results are robust to potential mis-measurement due to migration, pre-trends before the policy shift, and endogenous mixed marriages.

**Migration** To deal with the concern that peer groups are mismeasured due to migration, we re-estimate the baseline results, dropping all data after the 2000 census as well as individuals whose birth county and residency county are different in the 2000 census. The results in Appendix Table A5 entail coefficients similar to those in Table 2.

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<sup>24</sup>Also, Figure 3 suggests that the empirical density of the equilibrium prefectural cutoffs is skewed with a relatively high density in the first quartile,

**Dynamic impacts and pre-trends** Our baseline specification focuses on the average effect of material benefits. A more flexible way of examining the impact of  $b_{r,t}$ (Post Policy) is to allow the effect to vary by birth cohorts:

$$CME_{i,p,t} = \sum_{\tau=-3}^{\tau=+3} \beta_{b,\tau} Cohort_{r,\tau} \times I(\leq 0.5)_p + \sum_{\tau=-3}^{\tau=+3} Cohort_{r,\tau} + birthyear_t + pref_p + ethn_g + \gamma \mathbf{X}_{i,p} + \gamma' \mathbf{X}_{i,p} \times Post_{r,t} + prov_r \times year_t + \varepsilon_{i,p,t} . \quad (10)$$

In this specification, the birth cohort 1-5 years before the family planning policy (i.e.,  $\tau = -1$ ) is treated as the reference group and  $\tau \in \{-3, -2, 0, 1, 2, 3\}$  refers to more than 10 years before the policy, 6-10 years before the policy, ... , more than 10 years after the policy. If the estimates of  $\beta_{b,-3}$  and  $\beta_{b,-2}$  are different from zero, prefectures with different social motives were different already before the introduction of ethnic policies.

$\beta_{b,-3}$  and  $\beta_{b,-2}$  are weakly negative or insignificant, indicating that pre-trends are not critical. The estimation results are presented in columns (1)-(2) of Appendix Table A6 and visualized in Figure 5 (where the bars indicate 95% confidence intervals when standard errors are clustered at the prefecture level).

The interaction between individual and social motives becomes significantly positive after the policy shift. Moreover, the size of this interaction effect is increasing over time. These results are consistent with a dynamic extension of the model presented in Appendix Section A1. Specifically, if the social motives of each cohort are tied to the behavior of the previous cohort, equation (3) still defines a steady state value for  $\varepsilon_H^*$ . However, the equilibrium adjusts towards the new steady state according to the non-linear difference equation:

$$b - e(H) - \varepsilon_{H,t}^* = \mu \Delta(\varepsilon_{H,t-1}^*) . \quad (11)$$

In this model setting, comparing the dynamic adjustment – the impulse response – to the same  $b$  shock in groups with different initial shares, the difference between peer groups with low and high shares goes up over time, as it does in the data.

**Outliers** All the baseline results (as well as all other results to follow) are robust to outliers, in that they hold up to dropping one province, or one ethnic group at a time. This is not surprising since our estimates rely on within-province and within-ethnicity variation.

**Endogenous mixed marriages** An important concern about our analysis is that Man-Minority marriages may be simultaneous with the ethnic choice of children. If some unobserved factors drive the incidence of mixed marriages as well as the ethnic choices for their children, our findings in Tables 2 may just proxy for those omitted drivers rather than capture an interaction between individual and social motives. However, an increase in Han-Minority mixed couples

cannot explain a higher share of children following the mother’s ethnicity, unless the additional mixed couples are more likely to make this antisocial choice for their children. Our analysis provides a specific answer to the question as to why couples married after the ethnic policies become more likely to choose mother’s ethnicity for their children. But in a broader context, mixed marriages are certainly endogenous. In fact, we are currently doing additional research on the incidence of mixed marriages. While we leave the question about the drivers of mixed marriages for an accompanying paper, it is important to examine whether these marriages can explain our main findings.

Conceptually, the sharpest specification to deal with this would be to examine the choices within the same family before and after the implementation of ethnic policies. At the aggregate level, we find that the share of mixed couples (with more than one child) that have children of different ethnicities increases from 3.6% to 4.5% after the implementation of the one-child policy. To conduct a within-family analysis at the individual level, however, we need to limit the sample to Han-Minority families that have some children born before the policy and some born after the policy. Given that this sample restriction preserves only 9% of the mixed couples in our data, we simply do not have enough power for a within-family analysis at the prefecture level – family fixed effects explain over 97% of the variation in children’s ethnicity.

A less satisfactory approach which still provides a useful check, is to consider the subsample of couples who married before the introduction of ethnic policies, as their marriage decision is very unlikely to be affected by the ethnic policies. The restriction to early marriages, plus the fact that marriage-year information is available only in the 2000 and 2005 censuses, considerably cuts the sample from that in our baseline estimates.

Estimation results for this smaller sample are presented in columns (1)-(6) of Table 4 using the three measures of material benefits. Since we have excluded all couples married after the policy, most of the children in the sample were born before 1985. The resulting post-policy period is thus very short, which explains why the average effects of higher material benefits in columns (1), (3) and (5) are smaller than in the full sample (recall the dynamic pattern in Figure 5). However, the interaction effects with the social motive in columns (2), (4) and (6) are positive and similar in magnitude to the average effect, precisely as our baseline estimates in Table 2A. The magnitude of  $b_{r,t}(\text{Post Policy})$  is also similar to the results in Appendix Table A6 for the interaction effect 1-5 years after the policy.

Another way to deal with the concern of endogenous mixed marriages is to re-estimate our baseline specification in Table 2, while including the mixed-marriage share and its interaction with the share indicator  $I(\leq 0.5)_p$  in the same prefecture. Columns (7)-(9) of Table 4 show this specification only very marginally alters the estimates of the central interaction effects in Table 2.

The bottom line is thus that our baseline pattern on the interactions between individual and social motives appear to hold up even in the wake of endogenous mixed marriages.

### 5.3 Alternative Peer Groups

The notion of a peer group plays a key role in our model. The empirical estimates we have shown so far rely on the assumption that an earlier cohort of Han-Minority couples in the same prefecture makes up the relevant peer group for ethnicity decisions. It is important to consider other alternatives, however, since peer groups are not observable. In particular, one could argue that our definition is too wide in that Han-Minority couples are more influenced by other such couples who live under similar conditions, have the same education, or where the minority wife comes from exactly the same minority ethnicity. Below, we consider these three possibilities.

But one could also argue that our definition is too narrow: would the Han-Minority couples be also influenced by Minority-Han and Minority-Minority couples where they can choose whether to follow mother's ethnicity? We also consider this possibility.

**A narrower peer group** We begin with panel (a) of Table 5, by presenting separate results for rural-resident and urban-resident members of the same ethnicity-prefecture-cohort (peer-group definition 2A from Section 4). Although based on a considerably smaller sample, the estimates of the interaction between individual and social motives deliver a similar message as the prefecture-cohort-level results in Table 2. The effects are generally larger for urban residents, which is consistent with the fact that family planning policies are more strictly enforced in urban areas. These results also show that our main finding in Table 2 is unlikely to be driven by different perceived values of the ethnic benefits ( $b$  in the model). Another possibility is that the weight people put on social reputation ( $\mu$  in the model) differs between rural and urban residency. We do not attempt to empirically disentangle the impacts of  $\mu$  and  $b$ .

In another attempt to vary the definition of the peer group, we subdivide each cohort of mixed couples with Han men in the prefecture by the educational background of these men. In particular, we split the sample (according to definition 2B) into those with less than a high-school education, and those with high-school or more. The results are presented in panel (b) of Table 5. They show that the baseline findings in Table 2 are not driven by a particular educational group. The estimated interaction effect between individual material motives and social motives is similar to the baseline findings in Table 2.

In the estimates presented so far, we have assumed that all mixed couples with a Han man and a minority wife, no matter which minority, form the basis of the relevant peer group. But perhaps the peer group is specific to each specific minority group of the wife (definition 2C). To check whether this produces different results, we consider the case where, in theory, each cohort in a prefecture could make up 55 different peer groups. In practice, the average number is much smaller due to the regional dispersion of minorities. The central estimates, presented in panel (c) of Table 5, are slightly larger than the baseline estimates in Table 2.

**A wider peer group** Opposite to the refinement in panels (a)-(c) of Table 5, panel (d) presents the results using a wider peer group, where the peer group refers to all Han-Minority, Minority-Han and Minority-Minority couples that can choose whether to give their children the same ethnicity as the mother. Using the same specification as in panels (a)-(c), panel (d) shows a similar pattern for this wider peer group more widely. Together with the results in Table 5, these findings show that our main result is unlikely to be driven by the specific peer group we are focusing in the baseline.

In summary, the data are clearly consistent with the prediction on the interaction between individual material motives ( $b$ ) and social motives ( $\frac{d\Delta}{d\varepsilon^*}$ ). The results reported in Section 5.1-5.3 constitute solid and robust evidence that peer-group dependent social motives help shape the effect of individual material benefits on individual ethnicity choices, where stronger material motives are crowded in by the social motives and crowded out by them out in peer groups. The interaction between individual and social motives appears to be not only statistically significant but also quantitatively significant.

#### 5.4 Material Benefits and Intrinsic Costs – Testing P2

In this subsection, we confront prediction P2 with the data. This auxiliary prediction uncovers other important factors in ethnic choice. As mentioned before, it also serve as sanity checks of our model. The additional prediction concerns the interaction effect of material benefits and intrinsic costs. Given that the average share of children following mother’s ethnicity for Han-Minority households is not large (around 0.4), prediction 2 of our model is that the share of Han-Minority couples giving minority status to their children goes up by less after an increase in material benefits if the average intrinsic cost of making that choice is higher. As discussed in Section 4, we proxy the intrinsic costs by dummy variables indicating whether the child is a son ( $Son_i$ ) and whether the minority wife is religious ( $ReligiousWife_i$ ).

For the first proxy, we use a similar specification as in equation (9):

$$CME_{i,p,t} = \beta_s b_{r,t} \times Son_i + b_{r,t} + Son_i + birthyear_t + pref_p + ethn_g + \gamma \mathbf{X}_{i,p} + \gamma' \mathbf{X}_{i,p} \times b_{r,t} + prov_r \times year_t + \varepsilon_{i,p,t} . \quad (12)$$

The effect of material benefits related to fertility tend to be smaller when the child is a son. The estimates for our three measures of material benefits are displayed in columns (1)-(6) of Table 6. Columns (1), (3) and (5) report the results with prefecture fixed effects. Columns (2), (4) and (6) include additional fixed effects and controls. Having a son decreases the impact of a  $1\sigma$  increase in extra fertility by 0.003, around 10% of the mean effect. However, we find no such impact of material benefits related to education. A possible reason is that fertility matters more for the continuation of the patriarchal line.

Having a religious wife also cuts the effect of material benefits. Replacing  $Son_i$  with  $Reli-$



*giousWife<sub>i</sub>*, columns (7)-(12) of Table 6 show the results on the effect on Han men with religious minority wives. Having a religious wife decreases the impact of a  $1\sigma$  increase in extra fertility by 0.01, around one third of the mean effect.

We also conduct a dynamic analysis for  $b_{r,t}$ (Post Policy) by examining whether the lower effects for sons or religious wives are present already before the policy. These results are presented in columns (3)-(6) of Appendix Table A6 and visualized in Figures 6(a)-(b). Once again, the mitigating effects happen only after the policy, implying no significant pre-trends between sons and daughters, or between wives from religious and non-religious ethnicities.

Overall, we find that the estimates are consistent with Prediction P2. They also shed light on additional factors that can affect ethnic choices.

## 6 Alternative Explanations

Our model is consistent with the motivating facts F1-F2 in the Chinese micro data under certain assumptions (not too much negative skew in the  $\varepsilon$  distribution). With the same assumptions, central prediction P1 and auxiliary prediction P2 from the model are also borne out by the data. These results suggest that our model provides a plausible framework to understand the interaction of individual motives – material benefits and intrinsic costs – and social motives for identity choice.

But our findings could be explained by other theoretical and empirical mechanisms. In this section, we discuss two alternative ways of specifying the model and three alternative ways of interpreting the empirical findings. The overall lesson from this discussion will be that even though some of the alternative explanations may indeed help us think about the data, they are unlikely to drive our main results on individual-social interactions. Other alternatives can be ruled out *a priori*, on either theoretical or empirical grounds.

### 6.1 Nonlinear Utility

In our version of the Benabou-Tirole model, the preference function of couples is linear in material benefits  $b$  and intrinsic costs  $e + \varepsilon$ , but nonlinear in the social-reputation term  $\mu E(\varepsilon | m)$ . Suppose we got rid of the social-reputation term, but made preferences nonlinear in the individual benefits and costs. Perhaps this alternative setting could reproduce the prediction that the effect on the share of children following mother’s ethnicity of a change in benefits is larger when the share is smaller.

**An alternative model** To investigate this possibility, assume that the utility function of a Han-Minority couple is

$$u^H = v + m[u(b) - c(e + \varepsilon)] , \quad (13)$$

where  $u$  and  $c$  are nonlinear functions. The natural assumption is that the utility in material benefits  $u$  is concave, with decreasing marginal benefits ( $u' > 0$  and  $u'' < 0$ ) and the intrinsic cost  $c$  is convex, with increasing marginal costs in the type ( $c' > 0$  and  $c'' > 0$ ).<sup>25</sup> The indifference condition for having a child following mother's ethnicity now becomes

$$u(b) - c(e + \varepsilon^*) = 0 ,$$

which defines the cutoff value  $\varepsilon^*(b, e)$  as an increasing function of  $b$  and a decreasing function of  $e$  – at higher average intrinsic costs the share of children following mother's ethnicity is lower.

**Comparative statics** Straightforward comparative statics imply

$$\frac{\partial \varepsilon^*}{\partial b} = \frac{u'(b)}{c'(e + \varepsilon^*)} > 0 .$$

Suppose  $\varepsilon^*$  is lower because  $e$  is higher. How does this alter the effect of material benefits? The answer is given by:

$$\frac{\partial^2 \varepsilon^*}{\partial b \partial e} = -\frac{c''(e + \varepsilon^*)u'(b)}{(c'(e + \varepsilon^*))^2} < 0 .$$

That is to say, at lower  $\varepsilon^*$  (higher  $e$ ) – and a lower share of children following mother's ethnicity – the effect of  $b$  is lower. This contradicts our empirical results from the tests of P1. However, the prediction of this alternative model is in line with our empirical results on Prediction P2 in Table 6. Thus, the alternative model without a social reputation term can help us understand some aspects of the data, but does not offer an alternative explanation for our central result.

## 6.2 Social Interactions

How particular are our theoretical predictions and empirical results to the assumed form of social interactions? The latter has two dimensions: how the social motive enters the household's preferences, and which social peer group is the relevant one for the household. We have examined alternative peer groups in Section 5. Here, we discuss the specific form of social reputation.

As we have stressed, the Benabou-Tirole model produces either crowding in or crowding out because people take into account not only the stigma of making the antisocial choice but also the honor of making the prosocial choice, given a prevailing norm of prosociality and how other people in the peer group behave. Many papers in the literature consider only one of these, e.g., by focusing only on the stigma of breaking the norm and assuming that it becomes smaller the more people do it. But this is equivalent to assuming strategic complementarity, and hence crowding in *a priori*.

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<sup>25</sup>The results of this section largely hold up also in the case where the preferences are linear in the intrinsic costs and in the type.

How important is the model's assumed functional form for social reputation, namely that people decide on the identity choice for their children to signal their *expected type*, given how everybody else in the peer group behaves? One could think of other ways of modelling social reputation. The most natural alternative may be to assume that the honor of a child following father's ethnicity and the stigma of a child following mother's ethnicity, are given by the *shares* of norm-followers and norm-breakers in the peer group. Under that alternative assumption, we would write the gain in social reputation as

$$\Delta(\varepsilon^*) = h(1 - G(\varepsilon^*)) - sG(\varepsilon^*) = h - (h + s)G(\varepsilon^*) ,$$

where  $h$  and  $s$  are some positive constants.

In this case, we get  $\frac{d\Delta}{d\varepsilon^*} = -(h + s)g(\varepsilon^*)$ , such that choices would always be strategic complements, with maximal complementarity at the single peak of the p.d.f. for  $\varepsilon$ . This would deliver quite different predictions than our model, predictions that would not be supported by the data. In particular, we would not predict a larger effect of  $b$  on  $G$ , when  $\varepsilon^*$  is low and the share of kids following mother's ethnicity  $G(\varepsilon^*)$  is high, unless we made very specific and strong assumptions about the form of the unobservable distribution  $G$ .

The attractiveness of our social-reputation model defined over expected types is that it delivers non-trivial and testable predictions about the interaction between individual and social motives without overly strong functional-form assumptions.

### 6.3 Bargaining Power

Bargaining is an alternative mechanism to the material benefits of having a child following mother's ethnicity that could explain facts F1 and F2 in Figure 1. Specifically, women's bargaining power may have gone up over time so that a higher number of Han-Minority couples chose mother's ethnicity for their children. One may further argue that this mechanism may have become more powerful post ethnic policies, due to social and economic factors, like unbalanced and increasing sex ratios – more men per woman – among the Han. Below we discuss how this channel affects our findings in theory and in the data.

**A simple bargaining model** Let us sketch a simple bargaining model, without any social reputations, to see whether it can reproduce the patterns we find in the data. Suppose the Han man has a similar utility function as in (13), namely:

$$u^H = v + m[u(b) - (e + \varepsilon)] .$$

The minority woman has an analogous utility function:

$$u^M = v + m[u(b) + (e + \varepsilon)] ,$$

except that the intrinsic cost for the Han man of a child following mother's ethnicity is an intrinsic benefit for the minority woman. In these expressions for  $u^H$  and  $u^M$ ,  $\varepsilon$  is an idiosyncratic couple-specific shock to the intrinsic cost drawn after the couple is formed.<sup>26</sup> We assume that these utility functions are linear in the intrinsic cost since this allows aggregation. An efficient bargaining solution maximizes

$$(1 - \alpha(\mathbf{z}))u^H + \alpha(\mathbf{z})u^M = v + m[u(b) - (1 - 2\alpha(\mathbf{z}))(e + \varepsilon)] ,$$

where  $\alpha(\mathbf{z}) < 0.5$  is the relative bargaining power of the minority woman and  $\mathbf{z}$  a vector of variables that affects it. The indifference condition for a child following the mother's ethnicity becomes:

$$u(b) - (1 - 2\alpha(\mathbf{z}))(e + \varepsilon^*) = 0 .$$

**Predictions** The effect of material benefits on the share of Han-Minority children following mother's identity is proportional to:

$$\frac{\partial \varepsilon^*}{\partial b} = \frac{u'(b)}{(1 - 2\alpha(\mathbf{z}))} > 0 .$$

The effect of *changing bargaining power* for minority women can be determined from:

$$\frac{\partial \varepsilon^*}{\partial \alpha(\mathbf{z})} = \frac{2(e + \varepsilon^*)}{(1 - 2\alpha(\mathbf{z}))} > 0 .$$

Intuitively, higher bargaining power of the wife – a rise in  $\alpha(\mathbf{z})$  – raises  $\varepsilon^*$  and the share of children following mother's ethnicity. An alternative explanation for F2 – or a complementary explanation to the increase in  $b$  – is thus that the bargaining power of minority women in mixed marriages went up over time. However, to explain our results of testing P1 in Table 2,  $\alpha(\mathbf{z})$  would not only have to rise over time, but also have to rise by more in peer groups with a low  $\varepsilon^*$ .

In the remainder of this subsection, we check this possibility for three plausible proxies for  $\mathbf{z}$ , the determinants of minority women's bargaining power.

**Education differences** One proxy for one component of  $\mathbf{z}$  is the education gap between husband and wife. Plausibly, the spouse with higher education (and income) has more bargaining power. We calculate the gap based on the 1-4 levels of education (used as control variables in the baseline specification). The education difference between husbands and wives is around 0.2, meaning that, on average, women marry men with more education. Moreover, column (1) of Table 7 shows that the education gap decreases by 0.1 after the one child policy, consistent with

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<sup>26</sup>Having two independent shocks  $\varepsilon^H$  and  $\varepsilon^M$  revealed before the marriage would make the analysis more difficult. To say something useful about this case, we would need a marriage matching model.

the idea that bargaining power of minority women went up. Thus, higher bargaining power of minority women can help explain fact F2.

But can it also explain the results on our tests of P1? To approach that question, we start by using the education difference as an outcome. If this difference decreases with  $I(\leq 0.5)_p \times b_{r,t}$  (where  $b_{r,t}$  refers to  $b_{r,t}(\text{Post Policy})$  in this table), the change in woman’s bargaining power goes in the same direction as our baseline findings. However, as shown in column (2) of Table 7,  $I(\leq 0.5)_p \times b_{r,t}$ , is not significantly correlated with education differences. Thus, the data does not support the idea that education differences decrease faster after the one-child policy in peer groups where the share of children following mother’s ethnicity is initially low.

As a further check, we add the education difference – and its interaction with the share indicator  $I(\leq 0.5)_p$  – to specifications similar to those underlying Table 2A. The results are presented in column (3) of Table 7. After controlling for education differences and its interaction with  $I(\leq 0.5)_p$ , the estimated interaction coefficient of  $I(\leq 0.5)_p \times b_{r,t}$  is very close to that in Table 2, showing that this measure of bargaining power does not drive the interaction between individual and social motives.

**Age differences** A proxy for another component of  $\mathbf{z}$  is the age difference between husband and wife, where a smaller age difference presumably raises the wife’s bargaining power. The average age difference between husband and wife is 2.6 years. Moreover, as shown in column (4) of Table 7, the age gap decreases by 0.46 years after the once-child policy, consistent with increasing bargaining power of minority women, meaning that this factor too may have contributed to the trend summarized in F2. We are interested in whether it also explains the results on our tests of P1.

Column (5) of Table 7 estimates how age differences correlate with material benefits interacted with the initial share of children following mother’s ethnicity. We see that  $I(\leq 0.5)_p \times b_{r,t}$  is positively correlated with the age gap. So if women’s bargaining power due to age were an important factor behind the choice of identity, we should see mother’s ethnicity chosen less often where the initial share of children is small – the opposite to prediction P1 in our model. Similar to the estimates for education differences, column (6) in Table 7 presents the results when we include the age difference between husband and wife and its interaction with the share indicator  $I(\leq 0.5)_p$ . Again, the magnitude of the estimated individual-social interactions is very close to those in Table 2A.

**Sex ratios** A third candidate to measure bargaining power is the (male to female) sex ratio in the husband’s birth cohort of Han men within the same prefecture, assuming that a higher such ratio increases the bargaining power of the wife.<sup>27</sup> Once again, the result in column (7) of Table

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<sup>27</sup>The shortage of Han women becomes more pronounced in recent years. One implication of our findings is that mixed race children increase with the shortage of Han women.

7 is consistent with the previous findings using education and age gaps: sex ratios increase over time.

Column (8) shows that the increase is weakly larger in prefectures with a lower share of children following mother’s ethnicity, which goes in the same direction as our prediction on the effect of  $I(\leq 0.5)_p \times b_{r,t}$ . However, as shown in column (9), this estimate of  $I(\leq 0.5)_p \times b_{r,t}$  is only marginally affected by controlling for sex ratio and its interaction with  $I(\leq 0.5)_p$ , while the interaction between sex ratio and  $I(\leq 0.5)_p$  is insignificant. Therefore, even though this measure of bargaining power is positively correlated with our policy variable and may help explain F2, it is unlikely to drive our baseline estimate.

Column (10) presents the results when we include all three measures of bargaining power. Appendix A8 further presents the results using  $b_{r,t}$ (Extra Fertility) and  $b_{r,t}$ (Extra Scores) to measure material benefits. As the estimates show, bargaining power may help us understand F2, the increase of children following mother’s ethnicity after the introduction of the one-child policy, but it cannot explain our main findings on the interaction between social and individual motives. That is the bottom line of this subsection.

## 6.4 Censoring

Yet, another possible concern is that our main result might have a mechanical explanation, due to a kind of upward censoring. Specifically, our finding of a larger policy effect in prefectures where the share of children following mother’s ethnicity is small could be driven by the simple fact that there is little room to respond when this share is large and approaching one. To check for this possibility, we restrict the estimation sample to prefecture-cohorts with a share of children following mother’s ethnicity between 0.3 and 0.7. In this interval, there should be enough room for mixed households in every prefecture-cohort to respond without hitting a constraint. As shown in Table 8, the estimates from the restricted sample are similar to the baseline estimates from the full sample in Table 2. In other words, upward censoring does not drive our main findings on individual-social interactions.

## 6.5 Composition Effects

Finally, the results could conceivably capture another mechanical effect. Specifically, some couples may always have children following father’s ethnicity and others may always have children following mother’s ethnicity. Suppose now that after the one-child policy, the identifying variation we use, couples who choose mother’s ethnicity have a larger number of children than those who choose father’s ethnicity. Such a composition effect could mechanically explain our results without any change in behavior (other than regarding the number of children).

To check whether this possibility drives our findings, Table 9 presents separate results for families with a single child in columns (1)-(3), and for those with multiple children in columns (4)-(6). As the estimates show, however, the results for both types of households are similar to

the baseline results in Table 2. If anything, the pattern is slightly stronger for the single-child families. These findings imply that our baseline result is unlikely to be driven by a composition effect of households.

## 7 Conclusion

We provide theoretical and empirical frameworks to analyze the ethnicity of children in China's interethnic marriages. Drawing on earlier work by Benabou and Tirole (2011), we present a model which is consistent with two motivating facts. The model also delivers two additional predictions. The empirical tests we carry out on Chinese census data support these predictions. Most importantly, changes in individual material motives triggered by policy interventions are crowded in by social motives where the initial share of children following the mother's ethnicity is low, and crowded out when this share is high, precisely in the way that theory predicts.

Our empirical results suggest a new perspective to the literature on identity choice. Despite many fruitful studies on the determinants of identity, we have not seen any previous study of the interplay among individual material incentives, individual intrinsic motives, and social reputations. Our paper may open avenues for future research on identity choice in other settings.

A second value added is specific to China, where the economics and politics of ethnicity have been an important issue, yet rarely studied with economic methods. In future work, we hope to extend our empirical analysis to predictions from a model of directed marriage search, asking which individuals end up in mixed couples in the first place. Then, the ethnic choices for children analyzed in this paper would help determine the continuation value from the marriage stage.

Finally, we hope that our paper makes a more general contribution by taking the first steps towards a general understanding how individual (material and intrinsic) motives and social motives interact in shaping individual choices. As mentioned in the introduction, this is an issue we know too little about. Benabou and Tirole's theoretical framework is rich and flexible enough to be adapted to different types of decisions by individuals and households. Our empirical methodology for using micro data to investigate how social reputations modify the effect of individual incentives can be brought to bear on other economic, political or social choices, where individual and social motives play important roles. We believe that more such research should follow. It is only by applying a similar approach to a set of different issues – e.g., in tax evasion, political participation, fertility, or environment-friendly investments – that we may learn general lessons about the interplay between individual and social motives.

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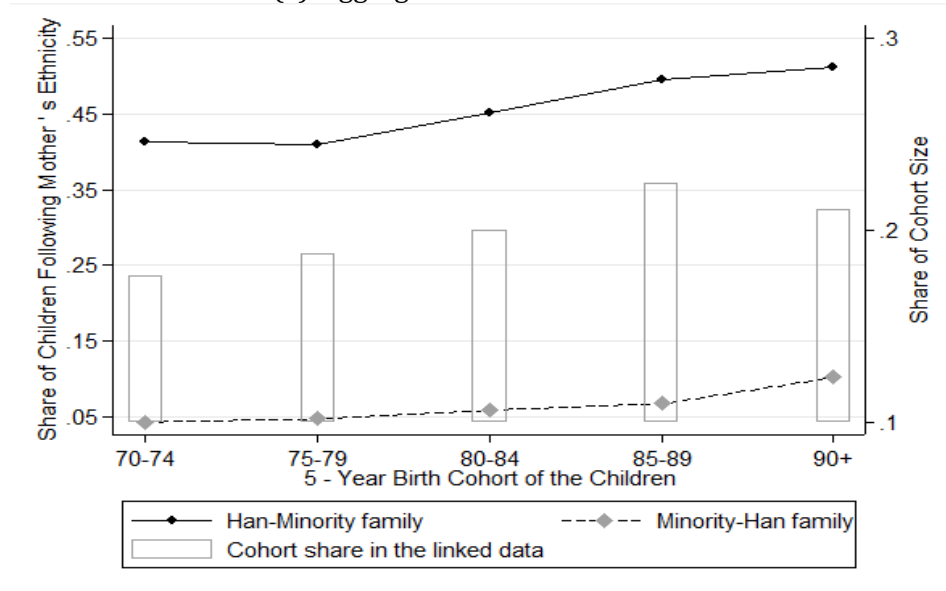


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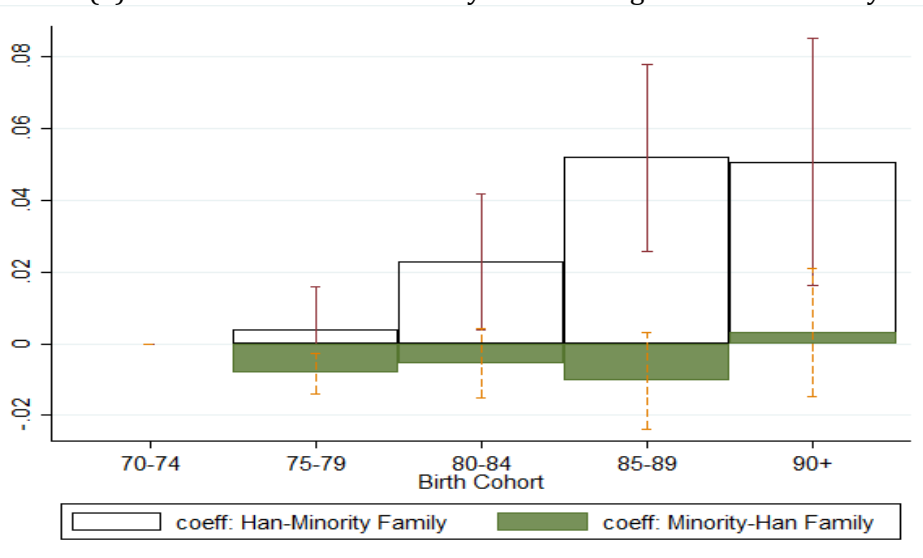
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**Figure 1 Share of Children Following Mother's Ethnicity by Type of Mixed Marriage and Birth Cohort**

(a) Aggregate Data: Share of Children

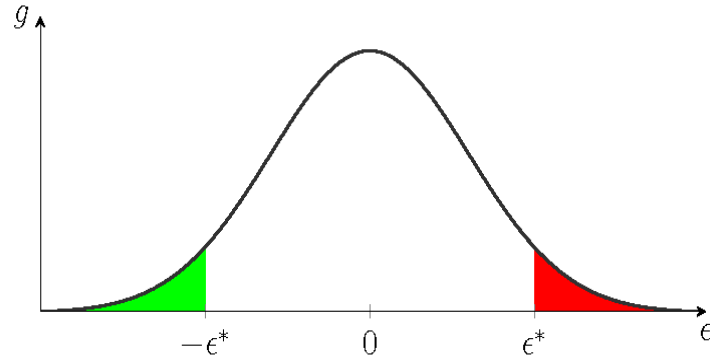


(b) Individual Data: Probability of Following Mother's Ethnicity

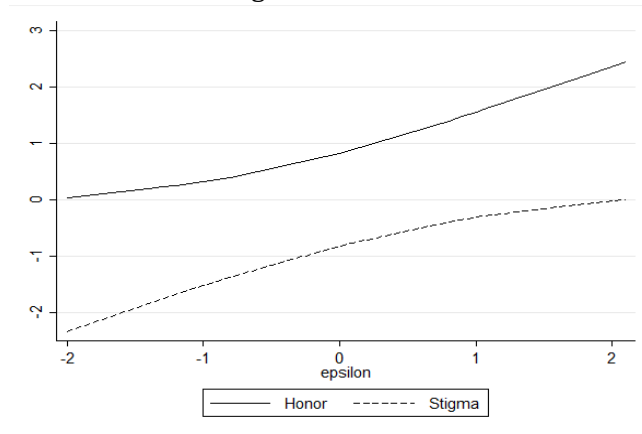


**Notes:** This figure shows two facts using aggregate and individual data: As in **F1**, children are more likely to follow their mother's ethnicity in Han-Minority families; as in **F2**, an increasing share of children following their mother's ethnicity in Han-Minority families after 1980. Figure (b) visualizes the results in columns (3) and (6) of Appendix Table A.2. It shows the probability of having a minority child in two types of mixed marriages over time, using those born during 1970-74 as the comparison group. The bars indicate 95% confidence intervals.

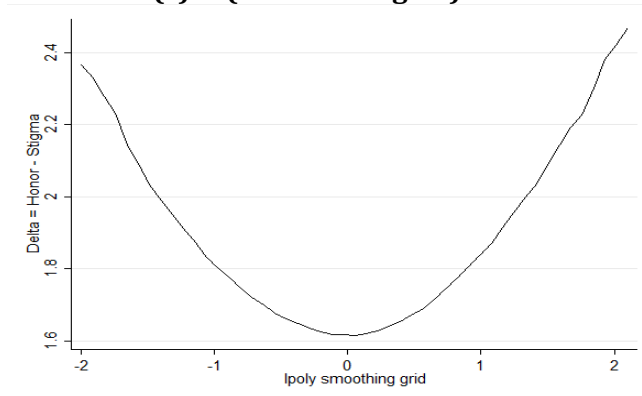
**Figure 2 The Race between Honor and Stigma**  
**(a) An illustration**



**(b) A numerical example**  
**Stigma and Honor**



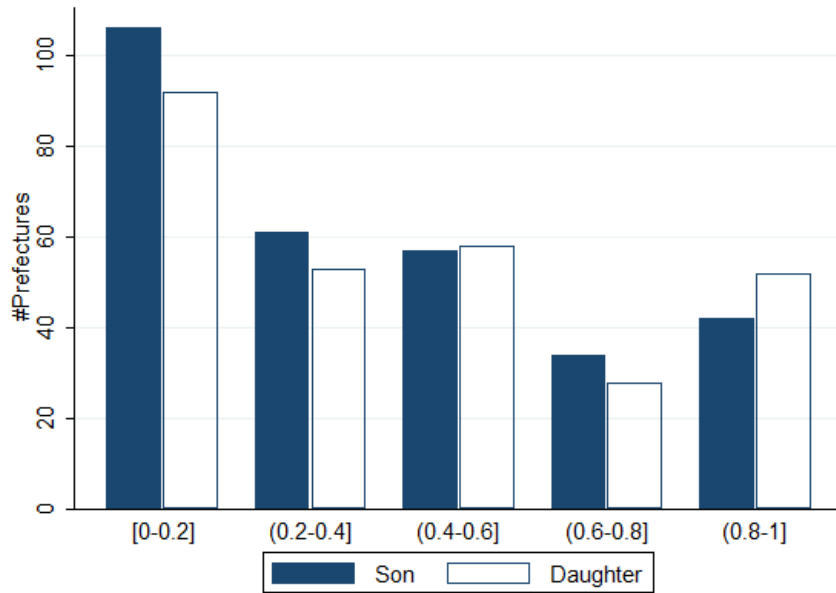
**(c)  $\Delta$  (= Honor-Stigma)**



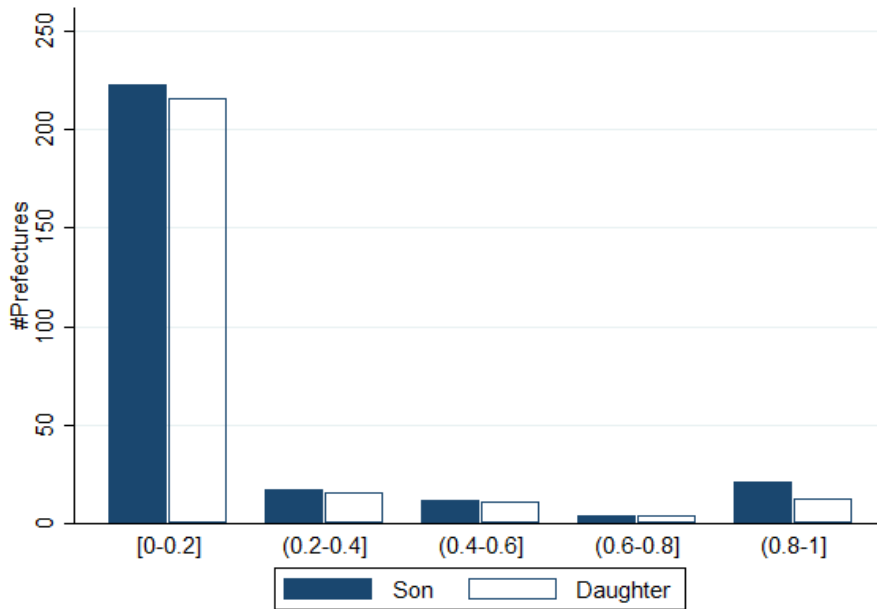
**Notes:** Panel (a) illustrates the social stigma (the green area) and the social honor (the non-green area) for a low equilibrium cutoff, and the stigma (non-red area) and the honor (the red area) for a high cutoff. Panel (c) illustrates how the gain in social reputation (Honor minus Stigma) has a minimum and changes with the equilibrium share of children following the mother's ethnicity. The numerical example in panels (b) and (c) relies on the specific assumption that  $\epsilon$  has a (0,1) normal distribution.

**Figure 3 Distribution of the Share of Children Following Mother's Ethnicity in Mixed Marriages across Marriage Type and Prefectures (for those born in 1970-74)**

**(a) Share of Children Following Mother's Ethnicity in Han-Minority Marriages**

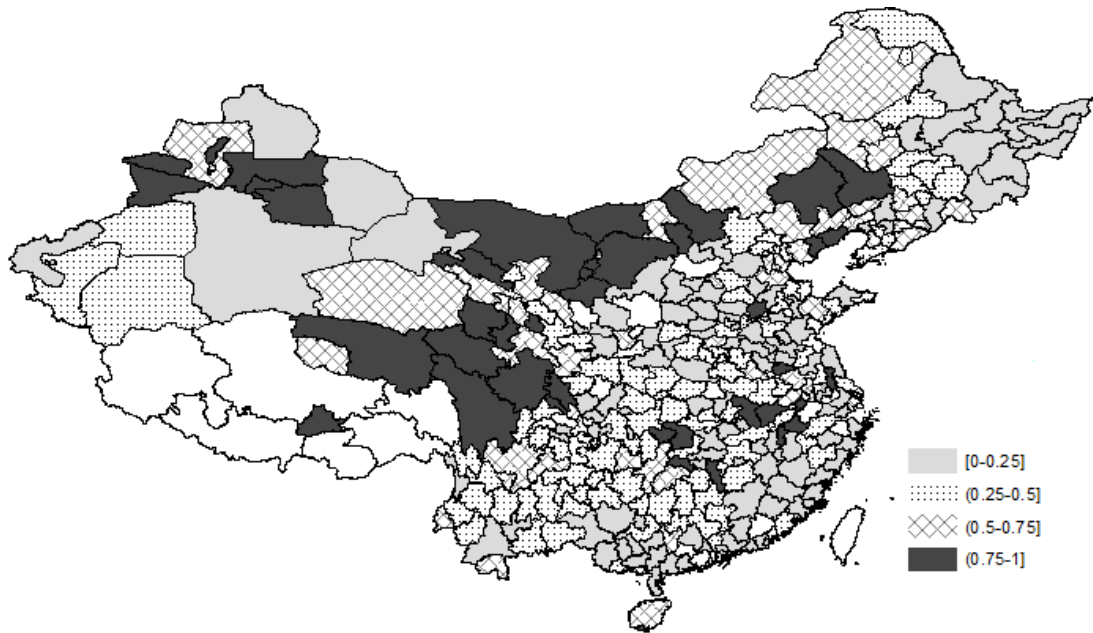


**(b) Share of Children Following Mother's Ethnicity in Minority-Han Marriages**



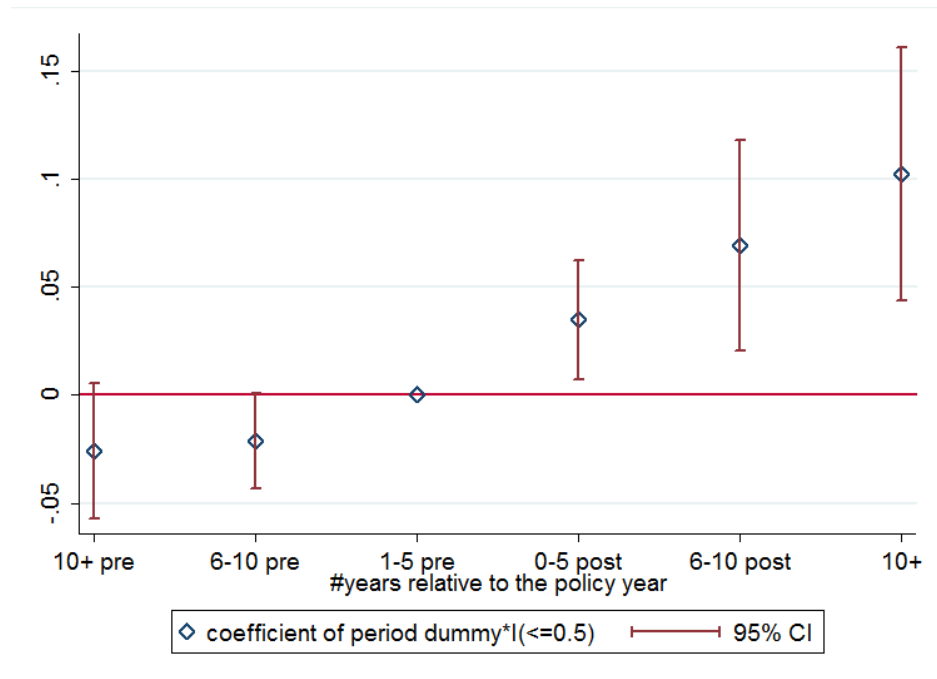
**Notes:** Panel (a) shows that the share of children following mother's ethnicity varies a great deal across regions for Han-Minority marriages and that sons are slightly less likely to do so. Panel (b) shows that the children of Minority-Han couples in most prefectures almost never follow their mother's ethnicity. Our empirical analysis focuses on Han-Minority families.

**Figure 4 Spatial Variation in the Share of Children Following Mother's Ethnicity in Han-Minority Marriages (for those born in 1970-74)**



**Notes:** This figure maps the average probability of children following mother's ethnicity born during 1970-74 in Han-Minority families across prefectures. A set of province fixed effects explains only about 36% of the variation across prefectures. Our empirical analysis exploits only within-province variation. We also control for province-by-year fixed effects to allow for flexible (non-parametric) time trends across provinces.

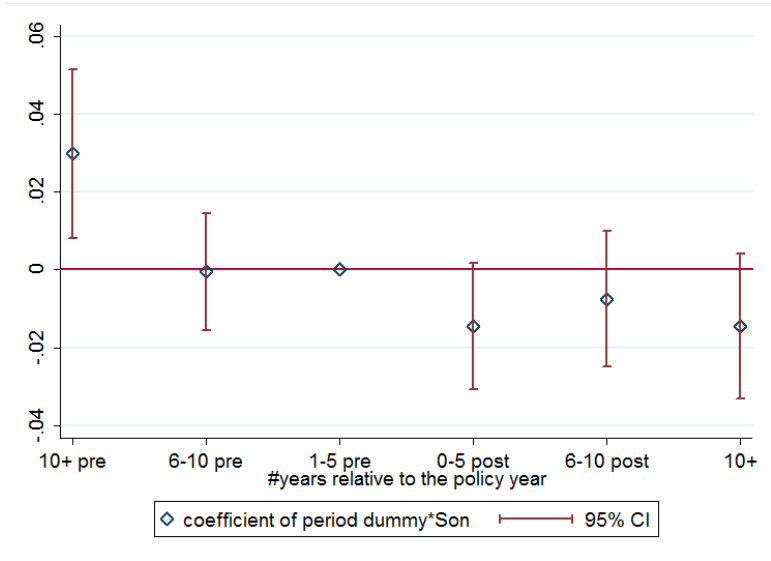
**Figure 5: The Dynamic Effects of Material Benefits (b) \* Social Motives on the Probability of Mixed-Marriage Children Following Mother's Ethnicity**



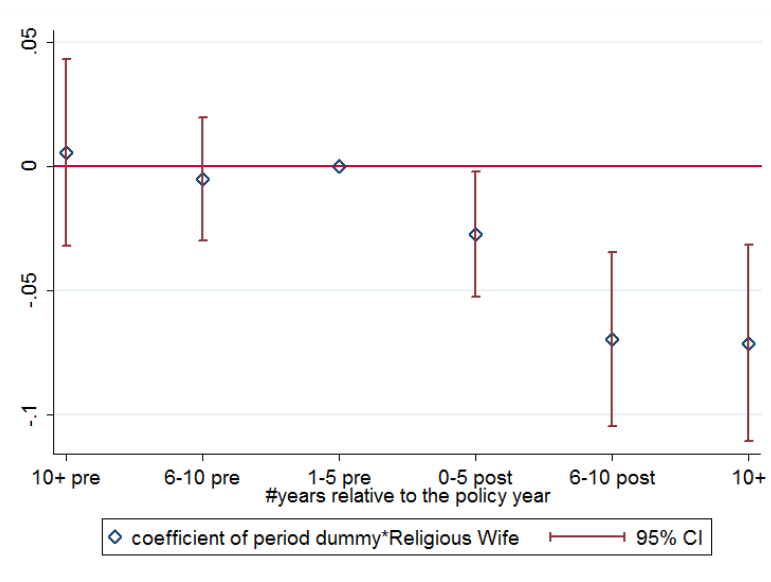
**Notes:** These figures plot the dynamic impacts of material benefits (measured by the rollout of family-planning policy) interacting with social motives (measured by the 1970-74 share of children following mother's ethnicity falling below a 0.5 cutoff). The reference period is 1-5 years before the introduction of the policy. The diamonds indicate the estimates in column (1) of Table A6 and the bars indicate 95% confidence intervals. The figure shows that (1) there are no pre-trends before the policy, and (2) the effect is increasing over time, which is consistent with the dynamic extension of the model in Appendix A1.

**Figure 6: The Dynamic Effects of Material Benefits ( $b$ )\*Intrinsic Costs ( $e$ ) on the Probability of Mixed-Marriage Children Following Mother's Ethnicity**

**(a) The Effect of Material Benefits ( $b$ )\*Son (vs. Daughter)**



**(b) The Effect of Material Benefits ( $b$ )\* Religious (vs. Non-religious) Wife**



**Notes:** These figures plot the dynamic impacts of material benefits (measured by the rollout of family planning policy) interacted with intrinsic costs (proxied by son and religious wife). The reference period is 1-5 years before the policy. The diamonds indicate the estimates in columns (3) and (5) of Table A6 and the bars indicate 95% confidence intervals. The figures show that there are no pre-trends before the introduction of the policy, and that the effects are consistent with model Prediction P2.



**Table 1: Summary Statistics**

	Mean	s.d.	#Obs.
Minority Husband -- Han Wife (little variation)			
Child Following Mother's Ethnicity	0.063	0.242	110,020
Han Husband -- Minority Wife (our focus)			
<b>a) Individual Characteristics</b>			
Child Following Mother's Ethnicity: all	0.465	0.499	124,940
Child Following Mother's Ethnicity: born before 1980	0.411	0.492	42,140
Child Following Mother's Ethnicity: born after 1980	0.492	0.500	82,800
Husband's education (1-4)	2.094	0.616	124,940
Wife's education (1-4)	1.878	0.654	124,940
Urban husband	0.261	0.439	59,278
Urban wife	0.261	0.422	59,278
<b>b) Ethnic Benefits Measures (b)</b>			
Post policy (rollout of family-planning)	0.581	0.493	121,908
Lagged extra Minority fertility (for women aged 40+)	0.059	0.129	97,217
Extra exam scores (relative to cutoff score for colleges)	0.014	0.015	124,938
<b>c) Proxy for Intrinsic Costs (e)</b>			
Son	0.531	0.499	124,940
Religious wife	0.185	0.388	124,940
<b>d) Prefecture Characteristics</b>			
Minority prob. of those born in 1970-74	0.388	0.310	319
Borderland	0.273	0.446	319
Minority pop. share in 1982	13.295 <sup>1</sup>	23.405	272
Share of pop. with high school or above in 1982	7.890	4.655	272
#children for a minority in 1982 (women aged 40+)	5.255	1.279	261

**Notes:** This table reports the summary statistics for the key variables in our analysis. The table shows that there is little variation in the ethnic choices in Minority-Han marriages. Our analysis in the paper focuses on Han-Minority marriages.

<sup>1</sup> Note that the mean of prefecture-level shares is slightly different from the total minority population share (around 9%).

**Table 2A Baseline Results for P1: The Impact of Material Benefits (b) and Social Motives on the Probability of Mixed-marriage Children Following Mother's Ethnicity** (Results using pre-post family planning policy to proxy material benefits *b*)

Dependent Variable: Child Following Mother's Ethnicity=0/1 (mean: 0.47)

	(1)	(2)	(3)	(4)	(5)	(6)
$I(\leq 0.5) * b(\text{Post Policy})$		0.072*** (0.019) [0.030]	0.069*** (0.019) [0.031]	0.071*** (0.020) [0.031]	0.074*** (0.022) [0.027]	0.070*** (0.014) [0.024]
$b(\text{Post Policy})$	0.078*** (0.011) [0.019]	0.031** (0.014) [0.014]	0.035** (0.013) [0.013]			
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE			Y	Y	Y	Y
Birth Year FE				Y	Y	Y
Controls* <i>b</i>					Y	Y
Province FE*Year FE						Y
Observations	121,908	121,908	121,908	121,908	108,914	108,914
R-squared	0.276	0.277	0.290	0.292	0.299	0.334

**Notes:** This table shows the results using the provincial roll-out of family-planning polices to measure material benefits. The cutoff (0.5) is defined by the share of minority children in Han-Minority families in the 1970-74 birth cohort. Controls include couples' characteristics (education-level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). The data come from three censuses and a mini census from 1982-2005. Standard errors in parentheses are clustered at the prefecture level, while those in brackets are clustered at the province level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.

**Table 2B Baseline Results for P1: The Impact of Material Benefits (*b*) and Social Motives on the Probability of Mixed-marriage Children Following Mother's Ethnicity Following Mother's Ethnicity** (Results using additional fertility and additional exam scores for minorities to proxy material benefits *b*)

Dependent Variable: Child Following Mother's Ethnicity=0/1 (mean: 0.47)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$I(\leq 0.5) * b$ (Extra Fertility)		0.027*** (0.009)	0.027*** (0.009)				0.022** (0.009)
<i>b</i> (Extra Fertility)	0.034*** (0.005)						
$I(\leq 0.5) * b$ (Extra Scores)					0.052*** (0.009)	0.034*** (0.009)	0.022*** (0.008)
<i>b</i> (Extra Scores)				0.044*** (0.007)			
Prefecture FE	Y	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE		Y	Y		Y	Y	Y
Birth Year FE		Y	Y		Y	Y	Y
Controls* <i>b</i>			Y			Y	Y
Province FE*Year FE			Y			Y	Y
Observations	107,903	107,903	96,874	124,938	124,938	111,944	96,873
R-squared	0.277	0.295	0.341	0.269	0.287	0.329	0.342

**Notes:** This table reports the results using two proxies for individual material incentives: extra fertility for minority in the previous birth cohort and extra scores for minority (relative to the provincial college acceptance cutoffs) in the college entrance exam. Both proxies are standardized. The cutoff is defined by the share of minority children in Han-Minority families in the cohort of 1970-74 births. Controls include couples' characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). The data come from three censuses and a mini census from 1982-2005. Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.

**Table 3 Results for P1': The Interaction Effects by Quartiles on the Probability of Mixed-marriage Children Following Mother's Ethnicity**

Dependent Variable: Child Following Mother's Ethnicity=0/1 (mean: 0.47)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Proxy for material benefits <i>b</i>	Rollout of Family Planning Post Policy = 0/1			Extra Fertility for Minority (lagged cohort)			Extra Exam Scores for Minority (share of cutoff score)		
I(0-0.25)* <i>b</i>	0.097*** (0.024)	0.099*** (0.023)	0.094*** (0.029)	0.030** (0.014)	0.036*** (0.013)	0.032*** (0.011)	0.052*** (0.016)	0.058*** (0.017)	0.040** (0.016)
I(0.25-0.5)* <i>b</i>	0.145*** (0.027)	0.144*** (0.026)	0.119*** (0.027)	0.044** (0.017)	0.041*** (0.013)	0.032*** (0.009)	0.077*** (0.015)	0.088*** (0.016)	0.063*** (0.014)
I(0.5-0.75)* <i>b</i>	0.079*** (0.025)	0.080*** (0.024)	0.052* (0.027)	0.032*** (0.009)	0.025** (0.011)	0.009 (0.011)	0.030 (0.018)	0.034** (0.017)	0.029* (0.016)
Prefecture FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE		Y	Y		Y	Y		Y	Y
Birth Year FE		Y	Y		Y	Y		Y	Y
Controls* <i>b</i>			Y			Y			Y
Province FE * Year FE			Y			Y			Y
<i>p</i> -value	0.014	0.019	0.000	0.514	0.219	0.048	0.003	0.000	0.0003
Observations	121,908	121,908	108,914	107,903	107,903	96,874	124,938	124,938	111,944
R-squared	0.278	0.293	0.334	0.277	0.296	0.341	0.270	0.288	0.329

**Notes:** According to Prediction P1', the interaction effects of material benefits and social motives estimated for the first three quartiles should be larger than that for the fourth quartile. Further, the effect for the second quartile should be larger than that for the third quartile – the *p*-values refer to tests for a difference between the effects in the second and third quartiles. Controls include couples' characteristics (education-level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.

**Table 4 Considering the Effects of Endogenous Marriages**

(Dependent Variable: Child Following Mother's Ethnicity=0/1)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Marriage Before the Policy						All		
$I(\leq 0.5) * b(\text{Post Policy})$		0.034*					0.065***		
$b(\text{Post Policy})$	0.030***	(0.020)					(0.015)		
$I(\leq 0.5) * b(\text{Extra Fertility})$				0.009				0.016***	
$b(\text{Extra Fertility})$			0.013***	(0.013)				(0.006)	
$I(\leq 0.5) * b(\text{Extra Scores})$						0.022*			0.023**
$b(\text{Extra Scores})$					0.013***	(0.012)			(0.009)
$I(\leq 0.5) * \text{HM Marriage Share}$							0.003	0.002	0.004
							(0.003)	(0.003)	(0.003)
Prefecture FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE		Y		Y		Y	Y	Y	Y
Birth Year FE		Y		Y		Y	Y	Y	Y
Controls*b		Y		Y		Y	Y	Y	Y
Prov. FE * Year FE		Y		Y		Y	Y	Y	Y
Observations	18,814	15,584	18,583	15,397	21,206	17,976	108,914	96,874	111,944
R-squared	0.293	0.319	0.294	0.320	0.274	0.300	0.334	0.341	0.329

**Notes:** Columns (1)-(6) present estimation results in a subsample of only those couples married before the policy. The results show that the baseline pattern is robust to the concern of endogenous marriages. Controls include couples' characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.

**Table 5 Results Using Alternative Peer Groups**

Dependent Variable: Child Following Mother's Ethnicity=0/1

	(1)	(2)	(3)	(4)	(5)	(6)
(a)	<u>Rural (mean: 0.49)</u>			<u>Urban (mean: 0.66)</u>		
I( $\leq 0.5$ )*b(Post Policy)	0.043*			0.121***		
	(0.023)			(0.025)		
I( $\leq 0.5$ )*b(Extra Fertility)		0.032***			0.036***	
		(0.009)			(0.009)	
I( $\leq 0.5$ )*b(Extra Score)			0.014			0.064***
			(0.011)			(0.020)
(b)	<u>Below High School (mean: 0.44)</u>			<u>High School + (mean: 0.60)</u>		
I( $\leq 0.5$ )*b(Post Policy)	0.058***			0.071***		
	(0.014)			(0.027)		
I( $\leq 0.5$ )*b(Extra Fertility)		0.024***			0.021	
		(0.009)			(0.015)	
I( $\leq 0.5$ )*b(Extra Score)			0.027***			0.037
			(0.009)			(0.023)
(c)	<u>By Precise Ethnicity of the Wife</u>			<u>(d) Using HM-MH-MM families</u>		
I( $\leq 0.5$ )*b(Post Policy)	0.106***			0.080***		
	(0.015)			(0.025)		
I( $\leq 0.5$ )*b(Extra Fertility)		0.045***			0.012*	
		(0.008)			(0.007)	
I( $\leq 0.5$ )*b(Extra Score)			0.046***			0.039***
			(0.007)			(0.012)
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE	Y	Y	Y	Y	Y	Y
Birth Year FE	Y	Y	Y	Y	Y	Y
Controls*b	Y	Y	Y	Y	Y	Y
Prov. FE * Year FE	Y	Y	Y	Y	Y	Y

**Notes:** This table shows that the baseline results hold up under alternative definitions of peer groups. Panel (a) separates rural/urban couples based on the 2000 and 2005 censuses; panels (b) and (c) define peer groups relevant for social reputation by education and minority groups; panel (d) defines these peer groups as all families that can make a choice of letting their children follow the mother's ethnicity, a choice option which cannot be made by same-ethnicity couples. Controls include couples' characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.

**Table 6 Results for P2: The Interaction of Material Benefits (b) and Intrinsic Costs (e) on the Probability of Mixed-marriage Children Following Mother’s Ethnicity**

Dependent Variable: Child Following Mother’s Ethnicity=0/1

	(1)	(2)	(3)	(4)	(5)	(6)
<i>b</i> (Post Policy)*Son	-0.017*** (0.005)	-0.008 (0.005)				
<i>b</i> (Extra Fertility)*Son			-0.004*** (0.001)	-0.003** (0.002)		
<i>b</i> (Extra Score)*Son					0.001 (0.002)	0.002 (0.002)
Son	-0.000 (0.004)	-0.009** (0.004)	-0.007** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)	-0.015*** (0.003)
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethn. FE		Y		Y		Y
Birth Year FE		Y		Y		Y
Controls* <i>b</i>		Y		Y		Y
Province FE*Year FE		Y		Y		Y
Observations	122,835	109,250	108,528	97,100	122,803	109,227
R-squared	0.278 (7)	0.334 (8)	0.278 (9)	0.341 (10)	0.276 (11)	0.334 (12)
<i>b</i> (Post Policy)*Religious Wife	-0.044*** (0.015)	-0.026** (0.013)				
<i>b</i> (Extra Fertility)* Relig. Wife			-0.016*** (0.004)	-0.011*** (0.004)		
<i>b</i> (Extra Score)*Relig. Wife					-0.027*** (0.008)	-0.047*** (0.008)
Religious Wife	0.204 (0.206)	0.127 (0.283)	0.072*** (0.013)	0.129 (0.276)	0.071*** (0.013)	0.130 (0.283)
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethn. FE		Y		Y		Y
Birth Year FE		Y		Y		Y
Controls* <i>b</i>		Y		Y		Y
Province FE*Year FE		Y		Y		Y
Observations	122,835	109,250	108,528	97,100	122,803	109,227
R-squared	0.293	0.334	0.280	0.341	0.277	0.335

**Notes:** This table shows that the effect of the policy change tends to be smaller when the child is a son or when the wife belongs to a religious ethnicity, consistent with Prediction P2 of the model. Controls include couples’ characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%

**Table 7 Alternative Explanation: Bargaining Power**

	(1) Edu. Dif.	(2) Edu. Dif.	(3) Minority Child	(4) Age Dif.	(5) Age Dif.	(6) Minority Child	(7) Sex Ratio	(8) Sex Ratio	(9) Minority Child	(10) Minority Child
I( $\leq 0.5$ )* <i>b</i> (Post Policy)		0.009 (0.015)	0.066*** (0.015)		0.369*** (0.110)	0.067*** (0.015)		0.018 (0.011)	0.062*** (0.014)	0.065*** (0.014)
<i>b</i> (Post Policy)	-0.116*** (0.006)			-0.465*** (0.124)			0.022*** (0.009)			
I( $\leq 0.5$ )* (Husb–Wife Edu.)			-0.002 (0.006)							-0.002 (0.006)
Husband – Wife Edu.			-0.005 (0.004)							-0.005 (0.004)
I( $\leq 0.5$ )* (Husb–Wife Age)						0.003** (0.001)				0.003** (0.001)
Husband–Wife Age						-0.003*** (0.001)				-0.003*** (0.001)
I( $\leq 0.5$ )* Sex Ratio								0.000 (0.056)		-0.002 (0.055)
Sex Ratio								0.046 (0.040)		0.049 (0.040)
Prefecture FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE		Y	Y		Y	Y		Y	Y	Y
Birth Year FE		Y	Y		Y	Y		Y	Y	Y
Pref. Characteristics* <i>b</i>		Y	Y		Y	Y		Y	Y	Y
Province FE*Year FE		Y	Y		Y	Y		Y	Y	Y
Observations	121,908	108,914	108,914	121,908	108,914	108,914	120,094	108,688	108,688	108,688
R-squared	0.036	0.047	0.326	0.066	0.076	0.326	0.373	0.404	0.326	0.291

**Notes:** Dependent variable is a 0/1 indicator for mixed-marriage child following mother's ethnicity. The table shows that our main results cannot be explained by changes in the bargaining power of minority women, when this power is proxied by education differences, age differences and sex ratios (for the husband's birth cohort). Prefecture characteristics are those listed in panel (d) of Table 1. Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%. Similar checks for the other two measures of benefits are presented in Appendix Table A7.



**Table 8 Alternative Explanation: Censoring (Shares between 0.3 and 0.7 only)**

Dependent Variable: Mixed-marriage Child Following Mother's Ethnicity=0/1

	(1)	(2)	(3)	(4)	(5)	(6)
$I(\leq 0.5) * b(\text{Post Policy})$		0.076*** (0.017)				
$b(\text{Post Policy})$	0.108*** (0.021)					
$I(\leq 0.5) * b(\text{Extra Fertility})$				0.022 (0.014)		
$b(\text{Extra Fertility})$			0.042*** (0.010)			
$I(\leq 0.5) * b(\text{Extra Score})$						0.031*** (0.010)
$b(\text{Extra Score})$					0.051*** (0.010)	
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE		Y		Y		Y
Birth Year FE		Y		Y		Y
Controls*b		Y		Y		Y
Province FE*Year FE		Y		Y		Y
Observations	54,345	48,480	47,286	42,258	54,345	48,480
R-squared	0.093	0.195	0.084	0.200	0.088	0.195

**Notes:** This table shows the baseline results on a sample restricting the share of Mixed-marriage children following mother's ethnicity for those born during 1970-74 lies between 0.3 and 0.7. It shows that censoring of the room for change should not be a critical concern. Controls include couples' characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*, 5%, \*, 10%.

**Table 9 Alternative Explanation: Composition Effects**

Dependent Variable: Mixed-marriage Child Following Mother's Ethnicity=0/1

	(1)	(2)	(3)	(4)	(5)	(6)
	Single-child Family			Multiple-children family		
I( $\leq 0.5$ )* <i>b</i> (Post Policy)	0.074*** (0.017)			0.060*** (0.016)		
I( $\leq 0.5$ )* <i>b</i> (Extra Fertility)		0.037*** (0.010)			0.022* (0.011)	
I( $\leq 0.5$ )* <i>b</i> (Extra Score)			0.062*** (0.019)			0.023*** (0.010)
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE	Y	Y	Y	Y	Y	Y
Birth Year FE	Y	Y	Y	Y	Y	Y
Controls* <i>b</i>	Y	Y	Y	Y	Y	Y
Province FE*Year FE	Y	Y	Y	Y	Y	Y
Observations	30,910	23,932	32,561	78,004	72,942	79,383
R-squared	0.290	0.297	0.284	0.357	0.363	0.354

**Notes:** This table shows that composition effects are unlikely to drive our baseline findings. Controls include couples' characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*, 5%, \*, 10%.

## Individual vs. Social Motives in Identity Choice: Theory and Evidence from China

### A.1 Dynamic Extension of the Model

In this section, we show how one can extend the model to get a dynamic adjustment to a new steady state after a one time shock.

#### Introducing dynamics

Suppose that the social-reputation motives of the parents in a given birth cohort (where a cohort could, e.g., be defined as a year) are tied to the behavior of the parents in the previous birth cohort. Specifically, the cutoff entering the gain in social reputation for Han-minority couples with birth cohort  $t$  is tied to the behavior of the Han-minority couples with birth cohort  $t - 1$ . One rationale for this assumption could be that the behavior of other couples is only observed with a period's lag. This assumption is similar to the one made by Besley, Jensen and Persson (2015) in their analysis of tax evasion in a dynamic version of the Benabou-Tirole model.

Drawing on their results, equation (3) still defines a steady-state value for  $\varepsilon_H^*$ . As long as other parameters,  $b$  and  $e(H)$  are constant, the equilibrium cutoff (and therefore the share of children following mother's ethnicity) adjusts gradually towards the new steady state according to the non-linear difference equation<sup>2</sup>:

$$b - e(H) - \varepsilon_{H,t}^* = \mu \Delta(\varepsilon_{H,t-1}^*) \quad (\text{A.1})$$

#### A Shift in $b$

Consider now an upward shift in benefits  $b$  that occurs in period 1. Consider two peer groups  $L$  and  $H$  with low and high initial shares  $\varepsilon_{H,0}^{*L} < \varepsilon_{L,0}^{*H}$  of children following mother's ethnicity. In the dynamic setting, the steady-state shift in the minority share is going to be larger in group  $L$  than in group  $H$ , in the same way as in the static model. But the impact effect of the shift in  $b$  in period 1 is the same in the two groups, as the behavior by the previous cohort  $\varepsilon_{H,0}^{*L}$  is given at the time of the shock. However, the cutoff starts changing from birth cohort 1 and onwards. Because the

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<sup>2</sup> The steady state is stable under the assumption we have already made that  $1 + \mu \frac{d\Delta(\varepsilon_1^*)}{d\varepsilon^*} \geq 0$ . This guarantees the root on non-linear difference equation (A.1) is less than 1 in absolute value.

share of children following the mother's ethnicity in the group  $L$  is adjusting more than the one of group  $H$ , its share will become progressively higher as we go forward in time from period 2. This is precisely what we see in Figure 5 in the main text and in the corresponding regression estimates in Table A6 of this Appendix.

## Figure A1 Anecdotal Evidence on Ethnic Choice

### (a) Example 1:

父亲是汉族，母亲是少数民族，那孩子的民族怎么决定？可以随母亲吗？

父亲是汉族，母亲是少数民族，那孩子的民族怎么决定？可以随母亲吗？wsjssc.com

"If the father is a Han and the mother is a minority, could the child be a minority?"



林医宝贝轩

来自：网页 2012-08-28

Generally should follow the father's. But following the mother's has the benefits of ethnic favors.

一般都随父亲，听说这样的孩子聪明，不过随母亲有好处，少数民族人国家有照顾

0



郭高高

小女孩 4岁2个月

来自：网页 2012-08-28

Ok. I have a friend who followed the mother's.

可以的。。。。我有个朋友就随母亲的

2



育儿2011

小男孩 6岁9个月

来自：网页 2012-08-28

Generally should follow the father's. It is fine if you insist on following the mother's.

一般都是随父亲的，你一定要随母亲应该问题也不大

0



嘴角带甜味

小女孩 3岁7个月

来自：网页 2012-08-28

The parent can make a choice. It is fine following the mother's.

父母可以自己决定，随母亲也行的

0



三口之家兔

小男孩 3岁1个月

来自：网页 2012-08-28

The child should follow the father's ethnicity. Only the children of a live-in husband will follow the mother's.

亲这样的话，孩子的民族一般是跟着孩子的父亲的，如果是跟着母亲的话，一般是上门女婿才可以的啊。

0



西西1011

小男孩 3岁10个月

来自：网页 2012-09-02

You can follow the mother's. A minority has the option of having a second child.

可以随母亲，当个少数民族，然后还可以再生一个。

0

**Notes:** This discussion comes from <http://www.babytree.com/ask/detail/3690549>, which shows that parents are thinking about both social motives and ethnic policies (especially the option of having more children for their child if they choose minority for their child).

**(b) Example 2:**

作者: 中二门 时间: 2010-5-18 13:17

标题: 我为孩子选择了汉族, 放弃了少数民族

前一阵去给孩子办户口, 我是汉族, 孩子她妈是少数民族, 我对警察说孩子入汉族。

警察大姐好好把我教育了一番, 说中考的时候少一分就多一操场人, 她家孩子要是6分, 稳上四中了, 说要对孩子负责。

最后我还是坚持入了汉族。我是想孩子成长过程中要靠自己的实力, 而不是靠特权和特殊的照顾。我可以花钱让她去上好的培训班, 也可以给她辅导, 而不是直接把分给她。希望孩子长大后能理解她的父母。

Zhongermen: "I went to register the birth of my child a while ago. I am a Han man and my wife is a minority. I told the police that I want my child to be a Han. The police kindly suggested that I should choose minority for the child. She said that one score lower implies an extra playground of competitors in the high-school entrance exam and that I should be responsible for my child's future. But I insisted on choosing Han in the end. I hope that my child's future will rely on his own ability, not ethnic favors."

作者: fh2315 时间: 2010-5-18 13:27

我觉得无所谓

如果没有什么特别的信仰的话。

fh2315: "Not a big deal if the minority is not religious."

作者: clactia 时间: 2010-5-18 15:49

告诉你吧加分什么的你要是瞧不上的话

至少少数民族还可以生2个孩子

clactia: "Well, if you despise the ethnic favor for extra scores, minorities can at least have more children!"

作者: 麻爪 时间: 2010-5-19 00:04

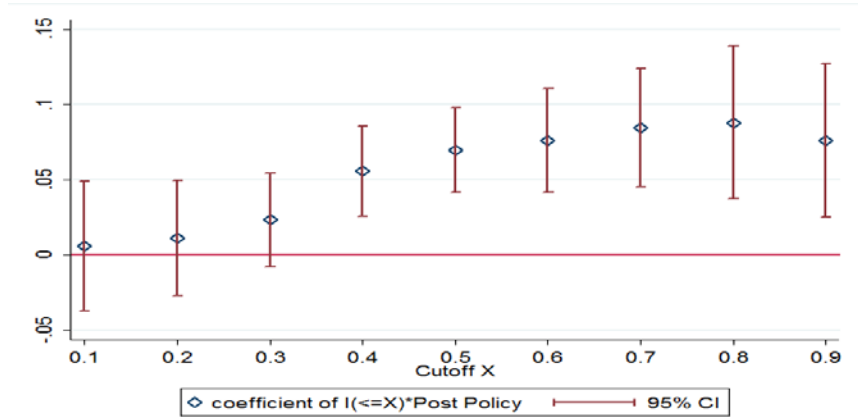
我是少数民族, 女儿随我, 原因很简单, 姓随爸爸, 民族就随妈妈吧, 虽然是人数多的少数民族但我还是以自己的民族为骄傲的, 所以希望女儿也是, 与加分无关

Magua: "I am a minority and my child follows my ethnicity. The reason is simple...Even though I belong to a minority group whose population size is large, I am proud of my ethnicity. So I hope that my child is also [proud of my ethnicity]. This has nothing to do with extra scores."

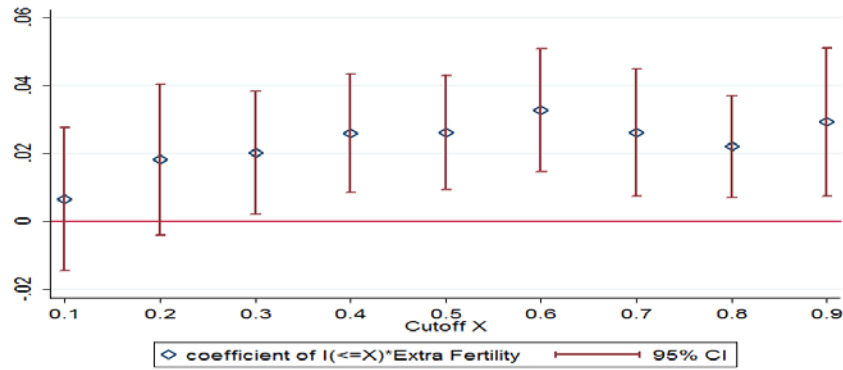
**Notes:** This discussion comes from <http://jzb.com/bbs/thread-335421-1-1.html?action=printable>, which shows that both honor and stigma are discussed in making the ethnic choices for the children.

**Figure A2 Results Using Different Cutoffs**

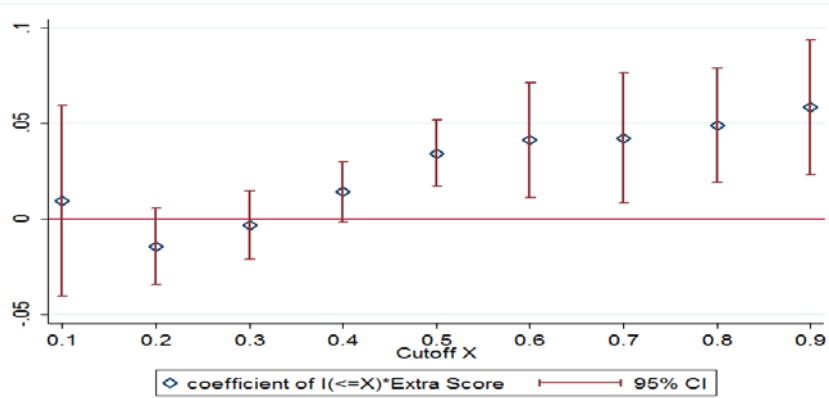
**(a) Coefficient of  $I(\leq X) \cdot b(\text{Post Policy})$**



**(b) Coefficient of  $I(\leq X) \cdot b(\text{Extra Fertility})$**



**(c) Coefficient of  $I(\leq X) \cdot b(\text{Extra Score})$**



**Notes:** This figure plots the results for testing prediction P1 while using different cutoff values for the share of minority children, ranging from 0.1 to 0.9. The econometric specification is the same as that in column (6) of Table 2A. The diamonds indicate the estimates and the bars through each dot indicates 95% confidence intervals.

**Table A1 Fact F1: HM-Families versus MH-Families**  
 Dependent Variable: Following Mother's Ethnicity = 0/1

	(1)	(2)	(3)	(4)
HM-Marriage	0.475*** (0.028)	0.447*** (0.028)	0.448*** (0.028)	0.449*** (0.028)
Prefecture FE		Y	Y	Y
Birth Year FE			Y	Y
Provincial Trends				Y
Observations	235,930	235,930	235,930	235,930
R-squared	0.260	0.370	0.371	0.382

**Notes:** This table shows that fact F1 in Figure 1 also holds at the individual level. Provincial trends indicate provincial-birth year linear trends. Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.

**Table A2 Fact F2: Ethnicity of Children by Cohorts**  
 Dependent Variable: Following Mother's Ethnicity = 0/1

	(1)	(2)	(3)	(4)	(5)	(6)
Born 1975-79	-0.002 (0.009)	0.017*** (0.005)	0.003 (0.006)	0.004* (0.002)	0.002 (0.002)	-0.008*** (0.003)
Born 1980-84	0.040** (0.015)	0.048*** (0.008)	0.020** (0.010)	0.016*** (0.003)	0.015*** (0.003)	-0.005 (0.005)
Born 1985-90	0.086*** (0.017)	0.089*** (0.011)	0.048*** (0.013)	0.024*** (0.004)	0.020*** (0.004)	-0.010 (0.007)
Born 1990+	0.108*** (0.024)	0.109*** (0.015)	0.047*** (0.018)	0.059*** (0.006)	0.047*** (0.005)	0.003 (0.009)
Prefecture FE		Y	Y		Y	Y
Provincial Trends			Y			Y
Observations	124,940	124,940	124,940	110,020	110,020	110,020
R-squared	0.008	0.272	0.277	0.007	0.082	0.086

**Notes:** This table shows that fact F2 in Figure 1 also holds at the individual level. Provincial trends indicate provincial-birth year linear trends. Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.



**Table A3 Differences across Marriages**

	HH	MM	HM	MH	
#Couples	6436486	417089	90704	81570	
Share in total marriages	91.60%	5.90%	1.30%	1.20%	
HM Share for a minority woman					1.3/(1.3+5.9)=18%
MH Share or a minority man					1.2/(1.2+5.9)=17%
Husband Edu-Wife Edu	0.27	0.26	0.21	0.23	
Husband Age-Wife Age	2.41	2.72	2.8	2.48	

**Notes:** This table describes the marriage patterns among all married couples in the four censuses (1982, 1990, 200 and 2005). This sample includes all the couples in the data, while our analysis on mixed marriages focuses on those with children born between 1970 and 2005.

**Table A4. Correlations among Prefecture Characteristics**

	Mother Ethnicity Prob.	Minority Pop Share	High school	Borderl and	#Children for Minority
Prob. of Children following mother's ethnicity in HM marriages (1970-74 cohort)	1				
Minority Pop Share 1982	0.24	1			
High-school edu.+ Pop Share 1982	0.04	-0.26	1		
Borderland	-0.14	0.15	0.05	1	
# Children for Minority Women (aged 40+)	0.11	0.25	-0.30	-0.01	1

**Notes:** This table presents bivariate correlations between prefecture characteristics. In particular, the probity of having a minority child in HM families is positively correlated with the minority-population share. This correlation rejects a "scarcity" effect, whereby children are likely to be minority in regions with higher minority populations because a more or less fixed set of material benefits get diluted by population. This is consistent with the fact that ethnic policies are not set via a fixed quota system.

**Table A5 Excluding Migrants: The Impact of Material Benefits (*b*) and Social Motives on the Probability of Mixed-marriage Children Following Mother’s Ethnicity** (Dependent Variable: Child Following Mother’s Ethnicity=0/1)

	(1)	(2)	(3)	(4)	(5)	(6)
$I(\leq 0.5) * b(\text{Post Policy})$		0.068*** (0.014)				
$b(\text{Post Policy})$	0.078*** (0.011)					
$I(\leq 0.5) * b(\text{Extra Fertility})$				0.023*** (0.008)		
$b(\text{Extra Fertility})$			0.033*** (0.005)			
$I(\leq 0.5) * b(\text{Extra Score})$						0.032*** (0.009)
$b(\text{Extra Score})$					0.043*** (0.007)	
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE		Y		Y		Y
Birth Year FE		Y		Y		Y
Controls* <i>b</i>		Y		Y		Y
Prov. FE*Year FE		Y		Y		Y
Observations	113,343	101,546	102,216	92,012	115,796	103,999
R-squared	0.285	0.344	0.284	0.348	0.278	0.339

**Notes:** This table presents results, excluding all data after the 2000 census as well as individuals whose birth county and residency county are different. Controls include couples’ characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.

**Table A6 The Dynamic Impacts of Material Benefits (proxied by rollout of family-planning policy) on the Probability of Mixed-marriage Children Following Mother's Ethnicity (Dependent Variable: Child Following Mother's Ethnicity=0/1)**

	(1)	(2)	(3)	(4)	(5)	(6)
X	I( $\leq 0.5$ )		Son		Religious Wife	
X*10+ years Pre Policy	-0.026 (0.016)	-0.024* (0.014)	0.030*** (0.011)	0.026** (0.011)	0.005 (0.019)	0.008 (0.018)
X*6-10 years Pre Policy	-0.021* (0.011)	-0.012 (0.011)	-0.000 (0.008)	-0.003 (0.007)	-0.005 (0.013)	-0.007 (0.012)
X*0-5 years Post Policy	0.035** (0.014)	0.043*** (0.014)	-0.014* (0.008)	-0.007 (0.009)	-0.027** (0.013)	-0.018 (0.014)
X*6-10 years Post Policy	0.069*** (0.025)	0.076*** (0.016)	-0.007 (0.009)	0.003 (0.009)	-0.070*** (0.018)	-0.046*** (0.016)
X*10+ years Post Policy	0.102*** (0.030)	0.103*** (0.022)	-0.014 (0.009)	-0.004 (0.010)	-0.071*** (0.020)	-0.045** (0.018)
Prefecture FE	Y	Y	Y	Y	Y	Y
Wife Ethnicity FE		Y		Y		Y
Birth Year FE		Y		Y		Y
Controls*Post Policy		Y		Y		Y
Province FE*Year FE		Y		Y		Y
Observations	121,908	108,914	122,835	109,250	122,835	109,250
R-squared	0.278	0.322	0.279	0.322	0.281	0.323

Notes: This table presents the dynamic comparisons, using the period 1-5 years before the policy as the reference. It shows no pre-trends. Controls include couples' characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%. Results in columns (1), (3) and (5) are visualized in Figures 5-6.

**Table A7 Additional Checks on Bargaining Power**

Dependent Variable: Child Following Mother's Ethnicity=0/1

	(1)	(2)	(3)
I( $\leq 0.5$ )* <i>b</i> (Post Policy)	0.065*** (0.014)		
I( $\leq 0.5$ )* <i>b</i> (Extra Fertility)		0.015*** (0.005)	
I( $\leq 0.5$ )* <i>b</i> (Extra Score)			0.025*** (0.007)
I( $\leq 0.5$ )* (Hus. Edu – Wife Edu.)	-0.002 (0.006)	-0.001 (0.007)	-0.000 (0.006)
Husband – Wife Edu.	-0.005 (0.004)	-0.007 (0.005)	-0.006 (0.004)
I( $\leq 0.5$ )* (Hus. Age – Wife Age)	0.003** (0.001)	0.002* (0.001)	0.002** (0.001)
Husband – Wife Age	-0.003*** (0.001)	-0.002* (0.001)	-0.002*** (0.001)
I( $\leq 0.5$ )* Sex Ratio	-0.002 (0.055)	0.020 (0.055)	-0.003 (0.056)
Sex Ratio	0.049 (0.040)	0.036 (0.040)	0.065 (0.043)
Prefecture FE	Y	Y	Y
Wife Ethnicity FE	Y	Y	Y
Birth Year FE	Y	Y	Y
Controls* <i>b</i>	Y	Y	Y
Prov. FE*Year FE	Y	Y	Y
Observations	108,688	96,659	108,686
R-squared	0.326	0.334	0.326

**Notes:** This table presents additional checks on bargaining power and shows that the interaction effect between material benefits and social motives cannot be explained by bargaining power per se, even though bargaining power can affect ethnicity choices. Controls include couples' characteristics (education level fixed effects and 5-year birth-cohort fixed effects, for both husband and wife) and prefecture characteristics (listed in panel (d) of Table 1). Standard errors are clustered at the prefecture level. Significance: \*\*\*, 1%, \*\*, 5%, \*, 10%.