A comparison and decomposition of reform-era labor force participation rates of China's ethnic minorities and Han majority

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Abstract

Purpose – The purpose of the paper is to examine observed differences in China's ethnic majority and minority patterns of labor force participation and to decompose these differences into treatment and endowment effects.

Design/methodology/approach – Data from the three most recent population censuses of China are employed to explore differences in the labor force participation rates of a number of China's important ethnic groups. Gender-separated urban labor force participation rates are estimated using logit regressions, controlling for educational attainment, marital status, pre-school and school-age children, household size, age, and measures of local economic conditions. The focus is on the experience of six minority groups (Hui, Koreans, Manchu, Mongolians, Uygurs, and Zhuang) in comparison to the majority Han. The technique developed by Borooah and Iyer is adopted to decompose the differences in labor force participation rates between pairs of ethnic groups into treatment and endowment effects.

Findings – Sizeable differences are found between the labor force participation rates of prime-age urban women of particular ethnic groups and the majority Han. Men's participation rates are very high (above 95 percent) and exhibit little difference between Han and ethnic minorities. For almost all pairwise comparisons between Han and ethnic women, it is found that differences in coefficients account for more than 100 percent of the Han-ethnic difference in labor force participation. Differences in endowments often have substantial effects in reducing this positive Han margin in labor force participation. Roughly speaking, treatment of women's characteristics, whether in the market or socially, tend to increase the Han advantage in labor force participation. The levels of these characteristics on average tend to reduce this Han advantage.

Research limitations/implications – The paper analyses only one aspect of the economic status of China's ethnic minorities – labor force participation. It would be useful also to examine income, educational attainment, occupational attainment, and unemployment.

Originality/value – This paper contributes to and expands the scant literature on ethnicity in China's economic transition.

Keywords Ethnic minorities, Labour, Economic reform, Employee participation, China

Paper type Research paper

All nationalities in the People's Republic of China are equal. [. . .] Discrimination against and oppression of any nationality are prohibited (Article 4 of the Constitution of the People's Republic of China).

1. Introduction

This paper contributes to the scant literature on ethnicity in China's economic transition. In the late 1970s the Chinese leadership embarked on a program of economic reform that initiated a transition to a market economy. At the national level, the transition led to rapid and sustained income growth and welfare improvements. Less is known about how China's different ethnic groups have fared in the reform process. The aim of this paper is to fill part of the gap.

2. China's ethnic minorities

According to China's 2000 population census, 8.5 percent of the Chinese population (106 million people) was classified as ethnic minority. When we use the terms "ethnic minority", "national minority" or "minority people" here, we are referring to the 55 national minorities that, with the Han majority, make up the 56 ethnic groups officially recognized by the Chinese central government. Chinese policies towards ethnic minorities stem in part from a legacy inherited from dynastic leaders, in part from an ethnic identification project built on Stalinist principles and implemented in the early years of the People's Republic, and in part from an array of adaptations to specific local situations. In the mid-1980s, government policy increased the benefits to minority identification[1] and thus provided an incentive for change in ethnic identity. Consequently, when on the basis of fertility trends an increase of ten million was expected, the actual number of people self- identifying as ethnic minorities in the 1990 census increased by 24 million[2].

Much of China's total land area (63.9 percent), particularly the politically sensitive border regions in Northwestern, Southwestern, and Northeastern China, is designated as autonomous ethnic minority regions (State Ethnic Affairs Committee, 2003, p. 545), and many of China's minority people (75 percent) reside in these specially designated areas (Information Office of the State Council of the People's Republic of China, 1999, p. 15). Published economic statistical data on China's minority peoples is almost always presented by autonomous region rather than by ethnic group[3]. This makes it difficult to shed light on questions about the economic well-being of China's minority peoples since the Han often comprise a significant proportion of the population in autonomous regions[4].

Overall economic indicators show a rising standard of living in ethnic minority regions. Colin Mackerras (2003, pp. 56-76) examines numerous indicators of the standard of living in China's minority areas, including measure of rural income, wages, healthcare provision, infrastructure development, and industrial development, concluding that since 1990 minorities have radically improved their standard of living. However, these improvements have not kept pace with developments in the national economy. China's minorities dwell predominately in western China, a region that includes China's poorest provinces and lags far behind the Eastern seaboard provinces in terms of income and economic development.

Socioeconomic treatises on China's ethnic groups (as opposed to autonomous regions) are rare. One notable exception is the work of Gustafsson and Li (1998, 2003), who make an important contribution to the economic literature about China's minority nationalities. They employ survey data gathered in 1988 and 1995 from 19 provinces, to assess the differences in rural income between the Han majority and ethnic minorities (grouped together). They find that the per capita income gap of 19.2 percent

in the earlier period grew to 35.9 percent in the latter period. When they decompose the income differential into differences due to endowments and treatment they find that the lion's share of the differential is due to differences in endowments and that minority incomes are lower than Han incomes largely due to location. They note that China's minorities are clustered in provinces with low per capita GDP and tend to dwell in mountainous areas and areas officially designated as poor.

Gustaffson and Ding (2008) build on this earlier work, employing survey data from 22 provinces gathered in 2002 to analyze differences between ethnic minority people (grouped together) and majority people in the levels of temporary and persistent poverty in rural China. They too argue that poverty in rural China has a very strong spatial dimension – that ethnic minorities have higher rates of both persistent and temporary poverty because minorities are concentrated in Western China, home to most of China's poor. They find that the rates of poverty differ little between minorities and the majority in Western China. They report that factors such as the education level of the household head, village mean income, and whether the village is located in a mountainous area are much more important than ethnicity in explaining poverty, and that ethnic minority status has little independent effect.

Hannum and Xie (1998), in another important contribution to this literature, focus on an array of particular minorities in a single province. They employ population census data to examine the effects of market reform on differences in occupational attainment of Xinjiang's (mainly Turkic) minorities in comparison to the Han. Hannum and Xie (1998) find that the ethnic gap in occupational attainment between the Han and the minorities widened between the 1982 and 1990 censuses. They attribute the rising gap to an increased gap in educational attainment between the Han and the minorities and a strengthening of the relationship between educational attainment and higher-status occupations.

Ding and Li (2009) analyze income inequality and differences in income determination for Hui and Han urban residents in Ningxia based on survey data gathered in 2007. They decompose differences in earnings into treatment and endowment effects and find that the treatment effects are more important than endowment effects in explaining the incomes differences between the Hui and Han. It is important to note, however, that the treatment effects do not necessarily favor the Han. Ding and Li (2009) report that returns to education are somewhat higher for the Han than the Hui, while the returns to experience are higher for the Hui than the Han. Similarly, party membership favors (has a bigger return for) the Hui while state ownership of the workplace favors the Han. Maurer-Fazio *et al.* (2007) analyze trends in the labor force participation of China's minorities between 1990 and 2000. They find that minorities were affected more adversely than Han by reductions in urban sector employment and exited the labor force more rapidly than Han.

The papers of Gustafsson and Li (1998, 2003) and Hannum and Xie (1998) suggest that minorities have not fared well in China's transition – that both rural income and occupational attainment gaps between minorities and the Han have widened. The former paper argues that location rather than ethnicity is the causal factor in the widening rural income gap while the latter paper suggests that important ethnic differences in labor market outcomes remain even after carefully controlling for location. Similarly, Gustaffson and Ding (2008) argue that rural poverty is better

explained by location rather than ethnicity, while Ding and Li (2009) find ethnicity a significant factor in urban income determination.

This nascent but growing literature on ethnicity in China's transition has addressed rural and urban income, rural poverty, and occupational attainment and touched on urban labor force participation. We add to this literature by deepening the analysis of the labor force participation of a number of China's important ethnic groups. We expand on the earlier analysis of Maurer-Fazio *et al.* (2007) in several significant ways. First, we extend the time period from 1982 to 2000 and include a larger set of ethnic minorities. More importantly, we control for both demographic factors and local economic conditions. We are particularly interested in whether the differences in majority and minority economic labor force participation rates are mainly attributable to differences in ethnic groups' attributes or the treatment of those attributes.

3. Research strategy

We utilize the method developed by Borooah and Iyer (2005) to decompose differences in labor force participation rates between the Han majority and a number of minorities into coefficient and attribute effects. The Borooah-Iyer model extends the well-known Oaxaca-Blinder decomposition method to logit models and, importantly for our case, allows the inclusion of multiple groups. Our analysis is based on the data of the 1982, 1990, and 2000 population censuses of China, which identify individuals' ethnic status and allow us to overcome some of the above-mentioned data scarcity problems.

We focus our analysis on the labor force participation patterns of urban residents[5]. We concentrate on six important minority groups and the Han majority. The limited number of urban ethnic minority residents in the census samples determined which groups we could include in our analysis. We've included every minority group with sufficient sample size to successfully run (with a consistent set of explanatory variables) the logits which underlie the Borooah-Iyer method. We thus carry out pair wise comparisons of the differences in labor force participation between the Han and Hui, Koreans, Manchu, Mongolians, Uygurs, and Zhuang[6].

We divide our samples by gender and separately analyze men's and women's labor force participation. Men's labor force participation rates for both majority and minority men are extremely high in international perspective. There is very little difference by ethnicity between men's labor force participation rates, as can be seen in Tables I-IV. Therefore, in the following sections of this paper, we focus our analysis and discussion on the differences in women's labor force participation.

In the next section we discuss our theoretical predictions about how the reforms might influence labor force participation rates. The following section describes the data used in this project. We then report estimates of urban labor force participation rates using logit regressions on the 1982, 1990, and 2000 data. These regressions controls for ethnic group, educational attainment, marital status, household composition, age, and local economic conditions and allow us to determine whether the participation rates of particular ethnic groups differ from that of the Han majority and whether there are any discernible trends in such differences over time. We then employ the Borooah Iyer technique to decompose the differences in labor force participation into treatment/coefficient and attribute/endowment effect. We summarize our findings in the final section of the paper.

Variable	Han	Hui	Korean	Manchu	Mongolian	Uygur	Zhuang
Labor force participation rate	0.988	0.983	0.980	0.989	0.989	0.988	0.976
Education level, proportion with …							
Primary or less	0.359	0.347	0.118	0.274	0.358	0.587	0.478
Junior middle school	0.405	0.432	0.455	0.442	0.319	0.259	0.335
Senior middle school	0.172	0.165	0.311	0.213	0.223	0.121	0.132
Post-secondary	0.064	0.056	0.116	0.071	0.100	0.034	0.055
Marital status, proportion							
Not married	0.129	0.118	0.075	0.084	0.087	0.130	0.114
Married, spouse not present	0.105	0.097	0.071	0.074	0.046	0.110	0.066
Household composition, mean							
Number of adults (aged 18 +)	2.786	2.793	2.856	2.851	2.720	2.585	2.925
Number of children aged 0-5	0.390	0.409	0.425	0.404	0.497	0.770	0.775
Number of children aged 6-12	0.582	0.594	0.590	0.606	0.699	0.881	0.844
Number of children aged 13-17	0.242	0.244	0.273	0.251	0.260	0.262	0.277
Age: proportion in each category							
25-29	0.284	0.271	0.276	0.281	0.271	0.255	0.281
30-34	0.213	0.220	0.237	0.208	0.191	0.211	0.229
35-39	0.152	0.150	0.136	0.154	0.157	0.170	0.121
40-44	0.154	0.174	0.167	0.160	0.185	0.166	0.166
45-50	0.198	0.185	0.183	0.197	0.196	0.197	0.202
Prefectural unemployment rates (percent)	1.58	1.67	2.46	2.29	1.98	1.15	2.74
Number of observations	218,846	2,984	785	1,515	439	745	668

Note: Data sources for all tables are a 1 percent micro-samples of the Population Censuses of China for the years 1982 and 1990, and 0.095 percent micro-sample of the Population Census of China 2000

Table I.
Sample statistics: urban men aged 25-50 in 1982

Variable	Han	Hui	Korean	Manchu	Mongolian	Uygur	Zhuang
Labor force participation rate	0.991	0.987	0.983	0.992	0.982	0.967	0.991
Education level, proportion with . . .							
Primary or less	0.252	0.242	0.094	0.248	0.182	0.378	0.409
Junior middle school	0.404	0.449	0.428	0.430	0.356	0.286	0.370
Senior middle school	0.261	0.247	0.375	0.248	0.347	0.228	0.192
Post-secondary	0.083	0.062	0.103	0.074	0.116	0.107	0.030
Marital status, proportion							
Not married	0.090	0.081	0.101	0.081	0.065	0.147	0.107
Married, spouse not present	0.051	0.056	0.019	0.029	0.028	0.081	0.032
Household compostion, mean							
Number of adults (aged 18 +)	2.604	2.599	2.662	2.595	2.592	2.556	2.976
Number of children aged 0-5	0.407	0.437	0.419	0.430	0.598	0.802	0.666
Number of children aged 6-12	0.492	0.517	0.479	0.522	0.678	0.729	0.850
Number of children aged 13-17	0.207	0.206	0.203	0.198	0.171	0.216	0.245
Age, proportion in each category							
25-29	0.251	0.249	0.229	0.263	0.313	0.275	0.280
30-34	0.228	0.224	0.275	0.266	0.273	0.230	0.193
35-39	0.222	0.220	0.227	0.219	0.215	0.174	0.211
40-44	0.159	0.162	0.139	0.131	0.101	0.171	0.170
45-50	0.141	0.145	0.130	0.121	0.099	0.150	0.147
Prefectural unemployment rates (percent)	1.27	1.60	2.32	1.56	1.02	2.49	1.08
Number of observations	282,720	2,975	841	3408	1298	1296	2,996

Table II.
Sample statistics: urban
men aged 25-50 in 1990

Variable	Han	Hui	Korean	Manchu	Mongolian	Uygur	Zhuang
Labor force participation rate	0.962	0.943	0.879	0.961	0.951	0.928	0.971
Education level, proportion with ...							
Primary or less	0.137	0.179	0.030	0.126	0.065	0.257	0.168
Junior middle school	0.441	0.447	0.358	0.460	0.322	0.329	0.405
Senior middle school	0.271	0.240	0.457	0.243	0.371	0.271	0.269
Post-secondary	0.150	0.134	0.155	0.171	0.241	0.144	0.158
Marital status, proportion							
Not married	0.090	0.106	0.185	0.083	0.070	0.116	0.122
Married, spouse not present	0.053	0.057	0.052	0.031	0.022	0.021	0.073
Household composition, mean							
Number of adults (aged 18 +)	2.501	2.525	2.526	2.505	2.377	2.589	2.516
Number of children aged 0-5	0.226	0.250	0.125	0.199	0.206	0.459	0.281
Number of children aged 6-12	0.389	0.418	0.306	0.351	0.480	0.603	0.394
Number of children aged 13-17	0.206	0.216	0.237	0.261	0.201	0.199	0.213
Age: proportion in each category							
25-29	0.198	0.209	0.151	0.168	0.238	0.250	0.227
30-34	0.226	0.219	0.211	0.242	0.211	0.257	0.255
35-39	0.215	0.201	0.259	0.217	0.217	0.229	0.198
40-44	0.173	0.154	0.224	0.182	0.192	0.151	0.155
45-50	0.188	0.217	0.155	0.191	0.141	0.113	0.165
Prefectural unemployment rates (percent)	4.79	4.64	9.65	8.25	5.59	3.88	3.24
Number of observations	87,393	912	232	828	369	292	647

Table III.
Sample statistics: urban
men aged 25-50 in 2000

	LFP rate differences	Coefficients effect	Coefficient percentage	Endowment effect	Endowment percentage
1982					
Han-Hui	0.0051	0.0065	126.56	−0.0014	−26.56
Han-Korean	0.0081	0.0137	169.29	−0.0056	−69.29
Han-Manchu	−0.0011	0.0021	−189.54	−0.0032	289.54
Han-Mongolian	−0.0009	0.0006	−62.86	−0.0015	162.86
Han-Uygur	−0.0002	0.0413	−1,8011.43	−0.0416	18,111.43
Han-Zhuang	0.0116	0.0080	68.62	0.0037	31.38
1990					
Han-Hui	0.0038	0.0037	97.22	0.0001	2.78
Han-Korean	0.0076	0.0013	17.68	0.0063	82.32
Han-Manchu	−0.0011	−0.0009	80.22	−0.0002	19.78
Han-Mongolian	0.0087	0.0140	161.02	−0.0053	−61.02
Han-Uygur	0.0241	0.0253	105.01	−0.0012	−5.01
Han-Zhuang	0.0003	0.0008	264.33	−0.0005	−164.33
2000					
Han-Hui	0.0186	0.0163	88.04	0.0022	11.96
Han-Korean	0.0822	0.1122	136.37	−0.0299	−36.37
Han-Manchu	0.0002	−0.0054	−2,720.87	0.0057	2,820.87
Han-Mongolian	0.0103	0.0043	41.78	0.0060	58.22
Han-Uygur	0.0335	0.1039	310.46	−0.0704	−210.46
Han-Zhuang	−0.0091	−0.0054	60.02	−0.0036	39.98

Notes: 1982: logit for Mongolian fails χ^2 test. 2000: logits for Zhuang and Koreans fail χ^2 tests

Table IV.
Decomposition of
differences in Chinese
men's labor force
participation rates: urban
men aged 25-50

4. Labor force participation rates

China's economic reforms have widened the range of women's opportunities for paid employment as the economic structure shifted away from capital-intensive heavy industry towards labor-intensive light industry and commercial services. Economic growth and concomitant wage increases raise the opportunity cost of not working. On this basis, we would expect to see higher levels of labor force participation in 1990 and 2000 than in 1982, as the gains from such participation increase. China, however, has long had very high labor force participation rates by international standards, especially for women. The labor force participation rates of urban women in 1982 (very early in the reform period) were 87.5 for women aged 25-50 and 70.5 for women aged 15 and above[7]. Thus, economic growth may not draw significant numbers of new workers into the labor force, as not many adults were outside the labor force in the pre-reform period.

The transition also created new obstacles for women's labor force participation. The state's retreat from its commitment to socialist ideology and enforcement of workplace protections for women coincided with a re-emergence of traditional patriarchal values (Croll, 1995; Entwisle and Henderson, 2000). This retreat combined with growing pressure to reduce the size of the state-owned enterprise work force put pressure on women, especially older women, to leave the labor force and return to more subordinate roles. In many cases, the effort expenditure required at the workplace increased with reform-era changes in workplace discipline, making it more difficult for working women to cope with household responsibilities and thus raising the costs of labor force participation, particularly for married women with young children. We thus add variables to control for the number of children of various age groups.

At the household level, rising incomes of spouses and/or other household members can be viewed as an income effect for married women that would allow some individuals to withdraw from the labor force when their spouse's earnings met household income goals. Labor force participation of married women could decline as a result of this phenomenon. Such a trend, however, might be dampened by China's birth planning policies, implemented first as the *wan xi shao* policy (later births, longer intervals, fewer children) in 1971 and followed by the even more stringent "one-child" policy of 1979, which drastically reduced total fertility rates and affected the value of time spent in home production. The vast majority of Chinese women continue to marry and to raise children but they have far fewer children and are finished with childbearing and childrearing at earlier ages than their mothers and grandmothers.

Education is increasingly rewarded in the Chinese workplace (Maurer-Fazio, 1999, Zhang *et al.*, 2005). We thus expect to observe a positive relationship between level of education and labor force participation.

The restructuring of the state-owned sector in the latter half of the 1990s led to the laying off of many millions of urban workers. Extended periods of lay-off led, in turn, to withdrawal from the labor force of some of these workers – the discouraged worker effect. The layoffs appeared to fall disproportionately on women and older workers (Giles *et al.*, 2006; Maurer-Fazio, 2006). We enter a series of age dummies to allow for changing age effects.

Finally, and importantly for the focus of this paper, with a relaxation of the protections afforded workers in the socialist period, managers may have begun to

indulge prejudices against particular ethnic groups by refusing to hire or disproportionately laying off members of these groups. If such practices are widespread, members of disadvantaged groups could become "discouraged workers" and withdraw from the labor force.

5. Data description

The data employed in this project are drawn from the three most recent population censuses of China. Our analysis is based on 1 percent micro data samples of the 1982 and 1990 censuses and a 0.095 percent micro data sample of the 2000 census[8]. We use all the data for urban residents available in the 1982 and 2000 census micro samples and take a random 50 percent sub-sample of the urban residents in the 1990 micro sample.

Individuals are considered to be in the labor force if they had a job on the day of the census or if they were unemployed and looking for work at that time. We equate those classified as "waiting for work" in the earlier censuses as seeking employment and thus part of the labor force.

Ethnicity is reported directly on the census questionnaires. The number of ethnic groups is consistent across all three censuses. We restrict the ages of the individuals included in our analysis to those between 25 and 50. The lower age bound allows us to focus our analysis on those who have completed their schooling. The upper bound is prescribed by two factors. First, and importantly, the Chinese population census data reports household relationships relative to the household head. This makes it very difficult to accurately assign dependent children to parents in multi-generation, extended households. To reliably sort out which children belong to which adults in the census households we make use of a set of questions related to fertility that is asked only of women aged 15 to 50[9]. Secondly, women who are considered "ordinary" workers face a retirement age of 50.

For each person in our census samples, we have created a set of variables that characterize ethnicity, the number of adults in the household, the age distribution of children in the household, marital status[10], education[11], and age.

We also created a set of variables at the prefecture and provincial levels that capture local economic conditions – provincial per capital urban income, provincial real GDP growth rates over the previous five years, and prefectural unemployment rates[12]. These variables are intended to capture differences in labor market opportunities and the general health of the local economy[13].

6. Results and discussion

We first estimate logits on labor force participation for 1982, 1990, and 2000 with controls for ethnic group, educational attainment, marital status, household composition, age, and local economic conditions. The results are presented in Tables V-VII. The base case consists of married Han of age category 25-29 with junior middle-school education. All explanatory variables are highly significant save for one or two ethnic group indicators in particular years.

Focusing first on the ethnic group indicators, we see that while in 1982 and 1990 Hui and Korean women had labor force participation rates that were indistinguishable from the Han, this changes over the course of the reforms. By 2000, Hui and Korean women, respectively, were 3.5 and 5.5 percent less likely to participate in the labor force

Variables	Coefficient	Robust standard error	Z values	Marginal probability dy/dx	X-bar
Ethnic group					
Hui	0.049	0.056	0.880	0.004	0.013
Korean	0.192	0.109	1.770	0.015	0.004
Manchu	−0.442	0.081	−5.480	−0.043	0.005
Mongolian	−0.804	0.123	−6.550	−0.091	0.002
Uygur	−1.487	0.094	−15.850	−0.214	0.003
Zhuang	1.793	0.159	11.280	0.074	0.003
Other ethnic minorities	1.171	0.125	9.370	0.061	0.005
Educational attainment					
Primary school or less	−0.771	0.016	−48.740	−0.077	0.199
Base case: junior middle school					
Senior middle school	1.309	0.034	38.230	0.075	0.139
Post-secondary education	1.318	0.070	18.890	0.066	0.029
Marital status					
Not married	−0.058	0.031	−1.920	−0.005	0.066
Base case: married spouse present					
Married spouse elsewhere	−0.183	0.019	−9.450	−0.016	0.166
Household composition					
Number of adults (aged 18 and over)	−0.087	0.006	−15.300	−0.007	2.759
Number of children aged 0-5	−0.470	0.014	−33.280	−0.039	0.421
Number of children aged 6-12	−0.146	0.009	−16.160	−0.012	0.678
Number of children aged 13-17	0.063	0.017	3.800	0.005	0.305

(*continued*)

Table V.
Labor force participation
of Chinese urban women,
aged 25-50, in 1982:
logistic regressions and
marginal effects

Variables	Coefficient	Robust standard error	Z values	Marginal probability dy/dx	X-bar
Age category					
Base case: aged 25-29					
Aged 30-34	0.092	0.023	3.940	0.007	0.216
Aged 35-39	− 0.215	0.029	− 7.530	− 0.019	0.160
Aged 40-44	− 0.614	0.028	− 22.230	− 0.060	0.161
Aged 45-50	− 1.762	0.025	− 71.170	− 0.228	0.181
Economic environment					
Prefectural unemployment rate	− 0.221	0.006	− 38.490	− 0.018	1.577
Provincial real per capita income	0.112	0.003	35.350	0.009	10.168
Provincial real five-year GDP growth	0.123	0.004	28.030	0.010	9.158
Constant	1.307	0.060	21.650		
Summary statistics					
Mean LFP				0.873	
Predicted LFP				0.910	
Log pseudolikelihood	−79,611.705				
Number of observations	245,402				
Wald χ^2(23)	23,942				
Prob > χ^2	0.000				
Pseudo R^2	0.149				

Table V.

Variables	Coefficient	Robust standard error	Z values	Marginal probability dy/dx	X-bar
Ethnic group					
Hui	0.095	0.056	1.710	0.008	0.010
Korean	−0.084	0.098	−0.850	−0.008	0.003
Manchu	−0.683	0.045	−15.190	−0.080	0.010
Mongolian	−1.096	0.065	−16.810	−0.150	0.005
Uygur	−0.965	0.066	−14.530	−0.126	0.004
Zhuang	1.535	0.089	17.180	0.079	0.011
Other ethnic minorities	−0.034	0.047	−0.730	−0.003	0.015
Educational attainment					
Primary school or less	−0.546	0.015	−35.780	−0.059	0.115
Base case: junior middle school					
Senior middle school	1.276	0.020	64.150	0.091	0.236
Post-secondary education	2.653	0.081	32.580	0.102	0.040
Marital status					
Not married	0.133	0.031	4.220	0.011	0.042
Base case: married spouse present					
Married spouse elsewhere	−0.025	0.022	−1.130	−0.002	0.085
Household composition					
Number of adults (age 18 and over)	−0.040	0.005	−7.290	−0.004	2.620
Number of children aged 0-5	−0.410	0.011	−37.550	−0.037	0.405
Number of children aged 6-12	−0.235	0.010	−24.460	−0.021	0.534
Number of children aged 13-17	−0.143	0.015	−9.720	−0.013	0.249

(*continued*)

Table VI.
Labor force participation
of Chinese urban women,
age 25-50 in 1990: logistic
regressions and marginal
effects

Variables	Coefficient	Robust standard error	Z values	Marginal probability dy/dx	X-bar
Age category					
Base case: age 25-29					
Aged 30-34	0.174	0.020	8.610	0.015	0.224
Aged 35-39	0.153	0.022	6.910	0.013	0.222
Aged 40-44	−0.320	0.024	−13.550	−0.032	0.155
Aged 45-50	−1.295	0.022	−58.880	−0.169	0.140
Economic environment					
Prefectural unemployment rate	−0.250	0.004	−65.030	−0.023	1.269
Provincial real per capita income	0.015	0.000	34.480	0.001	55.606
Provincial real five-year GDP growth	−0.067	0.004	−16.650	−0.006	5.956
Constant	2.309	0.040	57.690		
Summary statistics					
Mean LFP				0.864	
Predicted LFP				0.899	
Log pseudolikelihood	−16,561.750				
Number of observations	303,694				
Wald χ^2(23)	22,900				
Prob > χ^2	0.000				
Pseudo R^2	0.120				

Table VI.

Variables	Coefficient	Robust standard error	Z values	Marginal probability dy/dx	X-bar
Ethnic group					
Hui	−0.200	0.078	−2.560	−0.035	0.010
Korean	−0.304	0.153	−1.980	−0.055	0.003
Manchu	0.001	0.083	0.010	0.000	0.009
Mongolian	−0.316	0.114	−2.770	−0.057	0.005
Uygur	−0.619	0.122	−5.080	−0.120	0.004
Zhuang	0.563	0.109	5.160	0.079	0.007
Other ethnic minorities	0.176	0.071	2.460	0.028	0.015
Educational attainment					
Primary school or less	−0.216	0.040	−5.390	−0.038	0.034
Base case: junior middle school					
Senior middle school	0.664	0.021	32.280	0.100	0.251
Post-secondary education	2.193	0.052	41.850	0.212	0.099
Marital status					
Not married	0.437	0.041	10.580	0.064	0.057
Base case: married spouse present					
Married spouse elsewhere	0.047	0.034	1.410	0.008	0.071
Household composition					
Number of adults (aged 18 and over)	0.085	0.009	9.370	0.014	2.510
Number of children aged 0-5	−0.302	0.021	−14.160	−0.050	0.225
Number of children aged 6-12	−0.043	0.016	−2.710	−0.007	0.410
Number of children aged 13-17	0.115	0.022	5.130	0.019	0.221

(continued)

Variables	Coefficient	Robust standard error	Z values	Marginal probability dy/dx	X-bar
Age category					
Base case: aged 25-29					
Aged 30-34	0.080	0.027	2.900	0.013	0.227
Aged 35-39	0.062	0.031	2.000	0.010	0.210
Aged 40-44	−0.208	0.032	−6.480	−0.036	0.166
Aged 45-50	−0.955	0.029	−33.030	−0.184	0.184
Economic environment					
Prefectural unemployment rate	−0.068	0.002	−27.620	−0.011	4.779
Provincial real per capita income	0.003	0.000	7.140	0.001	65.563
Provincial real five-year GDP growth	0.068	0.007	9.500	0.011	9.057
Constant	0.431	0.075	5.780		
Summary statistics					
Mean LFP				0.762	
Predicted LFP				0.790	
Log pseudolikelihood	−47,140.171				
Number of observations	93,145				
Wald χ^2(23)	6,183				
Prob > χ^2	0.000				
Pseudo R^2	0.077				

than Han women (see column 4, "Marginal probabilities" in Tables V-VII)[14]. The vast majority of Koreans live in Northeastern China, an area hit hard by the decline of inefficient state-run enterprises. Korean men and women both exhibit steeper declines in participation rates than any other ethnic group studied here.

In 1982 and 1990, Manchu, Mongolian, Uygur women were significantly less likely to be in the labor force than Han women. By 2000, the Manchu women became indistinguishable from Han in terms of labor force participation. The very large gap between Uygur and Han participation in 1982 (21.4 percent) was reduced to 12.6 percent by 1990 and remained at 12 percent through 2000.

The Zhuang are the only ethnic group with labor force participation rates substantially and significantly higher than that of the Han. Throughout the whole period, Zhuang women's participation rates remained 7.4-7.9 percent above that of the Han.

As expected, education became an increasingly important determinant of labor force participation. At the beginning of the period, women with post-secondary educations were 6.6 percent more likely to be in the labor force than those with junior middle-school educations. By the end of the period, those with post-secondary education were 21.2 percent more likely to be in the labor force. Throughout the period, women with pre-school age children were consistently 4-5 percent less likely to be in the labor force than others.

Women's labor force participation is inversely related to local unemployment rates (suggesting a discouraged-worker effect) and, generally, positively related to the level of provincial urban income and provincial rates of GDP growth. The sample statistics presented in Tables VIII-X reveal a marked decline in urban women's labor force participation between 1990 and 2000 which is not mirrored in the sample statistics for men (Tables I-III).

To better understand whether the differences between Han and ethnic minority participation rates are due to differences in their endowments (education level, marital status, household composition, age structure, and location) or to the coefficients (responses to or treatment) of those attributes, we use the Borooah-Iyer decomposition technique. Its coefficient effect is derived by estimating the participation rate that would arise if all the women in the sample were treated as Han and subtracting from this the participation rate that would arise if all women in the sample were treated as one of the ethnic groups – for example, Manchu. Borooah and Iyer (2005) refer to this as the difference in synthetic probabilities, or in our case, the difference in synthetic participation rates. The endowment effect is the difference in Han and Manchu participation rates resulting from Han-Manchu differences in attributes when evaluated with a common coefficient vector. We estimate the endowment effect by subtracting the difference in Han and Manchu synthetic participation rates from the difference between the actual, observed Han and Manchu participation rates.

In the labor force participation setting, we interpret the coefficient effect to measure the "return", or "treatment" of women's average characteristics. If all women had Han average attributes rather than, say Uygur attributes, how would the difference in labor force participation change? We note that this treatment of attributes could be market-based (e.g. different returns to education) or cultural (e.g. different attitudes towards market and home production). The attributes effect in our model is broader

Variable	Han	Hui	Korean	Manchu	Mongolian	Uygur	Zhuang
Labor force participation rate	0.873	0.878	0.874	0.803	0.773	0.666	0.937
Education level, proportion with …							
Primary or less	0.511	0.472	0.277	0.378	0.459	0.637	0.693
Junior middle school	0.322	0.370	0.457	0.404	0.257	0.227	0.181
Senior middle school	0.139	0.132	0.236	0.183	0.221	0.116	0.112
Post-secondary	0.029	0.026	0.030	0.035	0.063	0.019	0.015
Marital status, proportion							
Not married	0.066	0.073	0.045	0.071	0.070	0.123	0.063
Married, spouse not present	0.167	0.135	0.107	0.136	0.101	0.074	0.166
Household composition, mean							
Number of adults (aged 18+)	2.759	2.772	2.884	2.829	2.676	2.645	2.821
Number of children aged 0-5	0.416	0.423	0.421	0.419	0.486	0.750	0.830
Number of children aged 6-12	0.673	0.696	0.614	0.587	0.707	1.114	0.973
Number of children aged 13-17	0.305	0.298	0.322	0.287	0.284	0.394	0.344
Age: proportion in each category							
25-29	0.283	0.266	0.307	0.309	0.302	0.265	0.300
30-34	0.216	0.228	0.203	0.195	0.194	0.191	0.216
35-39	0.160	0.175	0.129	0.137	0.162	0.186	0.144
40-44	0.160	0.165	0.168	0.163	0.182	0.170	0.172
45-50	0.181	0.166	0.193	0.196	0.160	0.188	0.168
Prefectural unemployment rates (percent)	1.57	1.67	2.44	2.25	2.02	1.11	2.84
Number of observations	236,885	3191	876	1260	444	775	814

Table VIII.
Sample statistics: urban
women aged 25-50 in
1982

Variable	Han	Hui	Korean	Manchu	Mongolian	Uygur	Zhuang
Labor force participation rate	0.866	0.858	0.831	0.770	0.706	0.587	0.957
Education level, proportion with …							
Primary or less	0.379	0.323	0.178	0.351	0.318	0.465	0.656
Junior middle school	0.343	0.393	0.421	0.346	0.310	0.254	0.224
Senior middle school	0.238	0.243	0.336	0.254	0.315	0.232	0.114
Post-secondary	0.040	0.041	0.065	0.049	0.058	0.048	0.006
Marital status, proportion							
Not married	0.040	0.055	0.062	0.035	0.040	0.134	0.060
Married, spouse not present	0.086	0.087	0.033	0.044	0.042	0.070	0.073
Household composition, mean							
Number of adults (aged 18 +)	2.612	2.615	2.626	2.585	2.679	2.653	2.942
Number of children aged 0-5	0.395	0.421	0.408	0.462	0.597	0.780	0.655
Number of children aged 6-12	0.524	0.527	0.479	0.547	0.668	0.905	0.927
Number of children aged 13-17	0.248	0.243	0.227	0.212	0.212	0.334	0.292
Age: proportion in each category							
25-29	0.258	0.255	0.262	0.305	0.344	0.275	0.282
30-34	0.224	0.220	0.268	0.245	0.256	0.215	0.197
35-39	0.223	0.228	0.199	0.209	0.181	0.167	0.196
40-44	0.155	0.162	0.144	0.126	0.109	0.175	0.164
45-50	0.140	0.136	0.127	0.115	0.111	0.169	0.161
Prefectural unemployment rates (percent)	1.27	1.69	2.36	1.51	1.02	2.43	1.08
Number of observations	286,173	2,922	866	3,133	1,373	1,304	3,388

Table IX.
Sample statistics: urban women aged 25-50 in 1990

Variable	Han	Hui	Korean	Manchu	Mongolian	Uygur	Zhuang
Labor force participation rate	0.763	0.721	0.676	0.721	0.718	0.648	0.836
Education level, proportion with …							
Primary or less	0.228	0.227	0.063	0.170	0.155	0.271	0.320
Junior middle school	0.423	0.409	0.415	0.445	0.343	0.295	0.411
Senior middle school	0.251	0.263	0.375	0.255	0.345	0.286	0.196
Post-secondary	0.098	0.101	0.146	0.130	0.157	0.148	0.073
Marital status, proportion							
Not married	0.056	0.060	0.119	0.064	0.039	0.108	0.086
Married, spouse not present	0.071	0.076	0.079	0.038	0.039	0.036	0.071
Household compostion, mean							
Number of adults (aged 18 +)	2.509	2.540	2.510	2.527	2.416	2.666	2.546
Number of children aged 0-5	0.222	0.249	0.158	0.216	0.259	0.392	0.264
Number of children aged 6-12	0.407	0.458	0.312	0.368	0.443	0.623	0.460
Number of children aged 13-17	0.220	0.234	0.253	0.253	0.248	0.238	0.250
Age: proportion in each category							
25-29	0.211	0.212	0.162	0.202	0.270	0.268	0.246
30-34	0.227	0.205	0.198	0.228	0.198	0.247	0.237
35-39	0.210	0.226	0.269	0.222	0.205	0.202	0.208
40-44	0.167	0.161	0.194	0.181	0.180	0.151	0.149
45-50	0.186	0.196	0.178	0.167	0.148	0.133	0.161
Prefectural unemployment rates (percent)	4.78	4.52	9.43	8.08	5.47	3.92	3.26
Number of observations	88,332	902	253	843	440	332	659

Table X.
Sample statistics: urban
women aged 25-50 in
2000

than in earnings models, as it includes local economic factors in addition to personal attributes. Thus, differences in local unemployment rates are part of the attribute effect.

We present pair-wise decompositions for Han and minority women in Table XI (and for Han minority men in Table IV). The coefficient effects clearly outweigh the attribute effects in all of our pair-wise comparisons. (The two exceptions are the Han-Hui 1982 and 1990 cases, where Han-Hui differences in participation rates are quite trivial at less than one percentage point.) A coefficient effect over 100 percent indicates that if all women had Han rather than minority group attributes, the higher labor for participation rate for the Han would be higher still. Han women attributes – whether it is easier to get a job due to employers favoring Han, or, it is easier to get a job because Han women are concentrated in lower unemployment regions – encourage Han labor force participation.

The attribute effects are mostly negative, indicating that differences in average Han and minority personal and economic characteristics tend to reduce the gap between Han and minority labor force participation. The reason for such negative attribute effects could be differences in numbers of young children at home, making labor force participation more difficult, or that minorities could be concentrated in higher unemployment regions, leading discouraged minority workers to drop out of the labor force in greater proportion to the majority Han.

Unfortunately, we cannot distinguish here between positive cultural attitudes and effects of potential employer discrimination. As discussed above, if employers discriminate against minorities in hiring and layoff decisions, minorities may become discouraged workers and drop out of the labor force at rates above that of the Han. Of the groups studied here, Zhuang women alone seem more disposed to participate in the labor force than the Han. Their actual rates of participation exceed those of the Han from 6.4 to 9.2 percentage points. The gaps between the observed participation rates of Han and Manchu, Mongolian and, most notably, Uygur women have narrowed over time. Although we may be tempted to speculate whether the attitudes of Han women have changed in ways that make them relatively less inclined to participate or the minorities more inclined to participate, or whether market forces have mitigated managers' potential inclination to discriminate against minorities, the data we are working with do not allow us to distinguish between these factors.

6. Concluding comments

The decision to enter the paid workforce or to engage in home production is a complex combination of economic, social and cultural forces. China's economic reforms have unleashed changes in all of these factors. Rewards to market work have increased with reform for most Chinese women, but re-emergent pre-socialist concepts of gender roles may encourage woman to forego these rewards in favor of home production. Our analysis yields indications that market and social treatment of Han attributes tend to ease women's entry into the labor force, while minority women appear to be rich in levels of those attributes that discourage market work at the margin. Further research is needed to separate the varied influences determining the labor force decisions of Chinese women.

	LFP rate differences	Coefficients effect	Coefficient percentage	Endowment effect	Endowment percentage
1982					
Han-Hui	− 0.0044	− 0.0018	39.99	− 0.0027	60.01
Han-Korean	− 0.0011	− 0.0051	480.23	0.0040	− 380.23
Han-Manchu	0.0702	0.0944	134.56	− 0.0243	− 34.56
Han-Mongolian	0.1008	0.1179	116.90	− 0.0170	− 16.90
Han-Uygur	0.2076	0.2585	124.53	− 0.0509	− 24.53
Han-Zhuang	− 0.0640	− 0.0681	106.42	0.0041	− 6.42
1990					
Han-Hui	0.0079	0.0009	10.91	0.0070	89.09
Han-Korean	0.0345	0.0698	202.54	− 0.0353	− 102.54
Han-Manchu	0.0960	0.0956	99.61	0.0004	0.39
Han-Mongolian	0.1601	0.1635	102.11	− 0.0034	− 2.11
Han-Uygur	0.2784	0.2742	98.49	0.0042	1.51
Han-Zhuang	− 0.0916	− 0.0785	85.63	− 0.0132	14.37
2000					
Han-Hui	0.0423	0.0473	111.91	− 0.0050	− 11.91
Han-Korean	0.0870	0.1050	120.69	− 0.0180	− 20.69
Han-Manchu	0.0417	0.0406	97.43	0.0011	2.57
Han-Mongolian	0.0447	0.0849	189.76	− 0.0401	− 89.76
Han-Uygur	0.1153	0.1634	141.70	− 0.0481	− 41.70
Han-Zhuang	− 0.0732	− 0.0758	103.49	0.0026	− 3.49

Table XI.
Decomposition of
differences in Chinese
women's labor force
participation rates: urban
women aged 25-50

Notes

1. The government's preferential policies include an exemption from, or easing of, the restrictions of the government's family planning program, as well as preferential treatment in school admissions, hiring and promotion, the financing and taxation of businesses and the provision of infrastructure (Sautman, p.86). Whether and how these policies are implemented is an important issue.

2. The Manchu and Tujia populations increased particularly rapidly between the 1982 and 1990 censuses.

3. See, for example, *China's Yearbook of Ethnic Works* (State Ethnic Affairs Committee, 2003), *China's Ethnic Statistical Yearbook* (State Ethnic Affairs Committee, Department of Economic Development and National Bureau of Statistics, 2000), and the Statistical Yearbooks of China (National Bureau of Statistics, 2004). Katherine Palmer Kaup (2000, p. 149) suggests that the income inequalities between ethnic groups are so pronounced that if they were published they would become a very contentious issue.

4. For example, in 2002, the minority population of the Inner Mongolian Autonomous Region constituted only 20.9 percent of its total population. Comparable figures for Guangxi Zhuang and the Ningxia Hui Autonomous Regions are 38.4 percent and 35.4 percent, respectively. The Tibet and Xinjiang Uygur Autonomous Regions are notable exceptions, with the minority populations constituting 96.7 and 60.1 percent of their respective populations (National Bureau of Statistics and State Ethnic Affairs Committee, 2003, p. 564, Tables 2-8).

5. Chinese population census questionnaires do not include any questions about income.

6. The Zhuang have the largest population amongst China's minorities. They reside in Southwestern China. The Mongolian and Uygur populations are geographically concentrated in politically sensitive areas in Northern and Northwestern China. The Hui and Uygurs are Muslim minorities. The Hui are broadly dispersed through China. The high education levels and older age structure of the Koreans make them quite distinct. Both the Koreans and Manchu reside in Northeastern China.

7. Authors' calculations based on the census data.

8. The 1982 and 1990 samples were obtained from the Data User Services of China Population Information and Research Center.

9. In 1982 and 1990 this set of questions was asked of women aged 15-64, but in 2000 it was asked only of women aged 15-50.

10. We control not only for marital status but also whether the spouse of a married individual was considered a member of the individual's household for the census enumeration. In 1982 and 1990, individuals away from their registered (*hukou*) residence for a year or more were enumerated at their then current location. In 2000, individuals away from their registered residence for six months or more were enumerated at their then current location.

11. We aggregate educational classifications into four categories that are consistent across the census years: primary or less, junior middle school, senior middle school, and post-secondary education.

12. Prefectures are the administrative units below provinces and above counties.

13. Provincial per capita urban income was obtained through China Statistical Yearbooks accessed through China Data Online (National Bureau of Statistics, n.d.). The growth rates of annual GDP over the previous five years were obtained through a compendium of GDP statistics released by National Bureau of Statistics (2004). The prefectural unemployment rate was calculated from the census data itself by aggregating unemployment information for all prefectural residents.

14. For binary variables, the table entries in the "Marginal probability" column represent the discrete change in probability as the binary independent variable is toggled from 0 to 1. For continuous variables such as age, the table entries are the change in the probability of labor force participation resulting from a one-unit change in the independent variable. All probabilities are calculated at the sample means.

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