Childcare, Eldercare, and Labor Force Participation of Married Women in Urban China, 1982–2000

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ABSTRACT

We employ Chinese population census data to consider married, urban women's labor force participation decisions in the context of their families. We find that the presence in the household of a parent, parent-in-law, or person aged 75 or older increases prime-age women's likelihood of participating in market work. The presence of preschool-aged children decreases it. The negative effect on women's labor force participation of having young children in the household is substantially larger for married, rural-to-urban migrants than for their nonmigrant counterparts. Similarly, the positive effect of coresidence with elders is larger for rural-to-urban migrant women than for nonmigrants.

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Figure 1

Labor Force Participation Rates by Age of Urban, Nonmigrant, Married Women in China: 1982, 1990, and 2000

Data Sources: 1 percent Micro Samples of the 1982 and 1990 Population Censuses of China and the 0.095 percent Micro Sample of the 2000 Population Census of China

I. Introduction

In urban China's prereform labor system where the state guaranteed workers a job and expected all able-bodied individuals to work, prime-aged women worked. In 1982, the labor force participation rate of married women between the ages of 25 and 50 living in urban areas was 86.7 percent.¹ (See Figure 1 for an age-labor force participation profile.) The rate was so high that few researchers invested time in considering who was not in the labor force. It seemed likely to be a mix of those with physical disabilities and the luck of the draw; that is, there would be a large stochastic element associated with who was in or out of the labor force

By the time of the Fifth National Population Census in 2000, the labor market in China had certainly changed. For the most part, the state had withdrawn from the business of assigning workers to work units, employment was no longer guaranteed for life, lay-offs had become commonplace, and unemployment was rising. Espe-

^{1.} Authors' calculations based on the 1 percent micro sample of the Third National Population Census of China.

cially hard hit were older, prime-aged women who were encouraged/forced to retire even earlier than the official retirement age of 50.² By 2000, the labor force participation rate of prime-aged, urban, married, nonmigrant women had fallen to 77.3 percent. The decline from the 1982 rates occurred almost entirely in the ten years between 1990 and 2000.³ Still, few labor economists were modeling women's labor force participation. (For notable exceptions see Cai and Wang 2004; Wang and Cai 2004; Yao and Tan 2005.) While the situation had changed, most observers continued to assume that all married women who could find a job were employed, a sizable number were unemployed, and the rest were discouraged workers.

But there were signs that not all women were either working or looking for work. First, as Figure 1 demonstrates, the shape of the age-labor force participation profiles did not change substantially over the 18-year period, despite the major restructuring of the economy and extensive changes in labor market institutions. The one notable change in the profiles revealed in Figure 1 is the later labor force entry of young people (aged 20–25) in 1990 and 2000 relative to 1982. This is consistent with the increasing period of school attendance of many urban residents. The profile based on the 2000 census also reveals a decline in the labor force participation of 25- to 35-year-olds, which may be related to childcare concerns.

Figure 2 shows the activity status of the urban, married women aged 25 to 50 who were not in the labor force as a percent of total number of urban, married women in this age category. Housekeeping, as an alternative to being in the labor force, increased over the three censuses, and, by 2000, 16 percent of urban, nonmigrant women reported themselves as housekeeping. The percentage of women reporting themselves as retired or resigned also increased between 1990 and 2000. During this period, income was rising rapidly among some urban households. These households were paying for expensive education for their children and buying new homes (and even second homes). Might they also have invested in a stay-at-home mom to direct the educational activities of their child and to look after the growing numbers of aged? Maurer-Fazio, Hughes, and Zhang (2005 2007) found both a decline in urban women's labor force participation (especially at older ages) and differentials in urban women's labor force participation by marital status. Married women exhibited lower rates of labor force participation than unmarried women. Yao and Tan (2005) found that women's labor force participation was inversely related to spousal income but that spousal income was insufficient to explain the steep decline of Chinese women's labor force participation.

Figure 2 also reminds us of the extraordinary change in the composition of the urban labor force between 1982 and 2000. The loosening of the strict migration controls that prevailed under planning led to large increases in the numbers and share of rural-to-urban migrant workers in the urban work force. By 2000, married, rural-to-urban migrant women constituted 11.6 percent of the married women aged

^{2.} The retirement age of 50 applies to women who are "ordinary" workers. The retirement age for female cadres and those with advanced degrees is 55. The retirement age for men is 60.

^{3.} A similar steep decline in women's labor force participation occurred over the same period in the Central and East European economies undergoing transition from socialist to market economic systems (see Pollert 2005).



Activity Status of Urban Women Who Are Not in the Labor Force, Aged 25–50 (as percentages of all rural migrant and nonmigrant women aged 25–50)

Data Sources: 1 percent Micro Samples of the 1982 and 1990 Population Censuses of China and the 0.095 percent Micro Sample of the 2000 Population Census of China

25–50 enumerated in urban areas.⁴ In 1990, the comparable share was only 2.4 percent.⁵ Most of these married, female, rural-to-urban migrants came to the urban areas for employment opportunities, but some also migrated to accompany and support their husbands and children. The labor force participation rate of prime-age, married, rural-to-urban migrant women in urban China in 2000 was 62.3 percent, a full 15 percentage points below that of their nonmigrant counterparts.

As shown in Figure 2, migrants were much more likely than nonmigrants to define their activity status as housekeeping. In 2000, 33 percent of married migrants listed themselves as housekeepers. The trend in the labor force participation of migrants was the opposite of that of nonmigrants. In 2000, a greater percent of married, rural-to-urban migrant women were in the labor force than in 1990, while the labor force participation rate of their nonmigrant counterparts declined over the same period.

^{4.} Authors' calculations based on the 0.095 percent micro sample of the 2000 Population Census and the 1 percent micro sample of the 1990 Census.

^{5.} One needs to be a bit cautious here as the rules for enumerating migrants changed between the 1990 and 2000 Censuses. In 1990 migrants who had been in residence for one year or more were enumerated in the urban area. In 2000 there was more effort placed on enumerating the migrants in the urban areas and the residency length requirement was reduced to six months.





Data Sources: 1 percent Micro Samples of the 1990 Population Censuses of China and the 0.095 percent Micro Sample of the 2000 Population Census of China

Figure 3 provides a detailed look at the age-labor force participation profile for married, rural-to-urban migrant women enumerated in urban China. The shape of the migrants' age-labor force participation profile differs dramatically from that of nonmigrants. The decline in labor force participation for this group begins at age 20 and is quite rapid until age 26. Thereafter, labor force participation rates remain fairly stable until age 42 when another rapid decline begins that lasts until age 50. The median age of the married migrant women was 33. Thus, the majority of married, migrant women were in the higher labor force participation age groups.

In this paper, we explore the determinants of the labor force participation decisions of both rural-to-urban migrant and nonmigrant, married women in urban China and investigate how these determinants have changed over the period made visible by the three censuses of 1982, 1990, and 2000.⁶ We consider married women's labor

^{6.} The rate of marriage in China is still extremely high, so that limiting our sample to married women aged 25-50 does not eliminate very many prime-age women. Zhang and Gu (2007) report that the percent of women aged 30-34 who are single is 1.3 percent in 2000, and the percent of women aged 35-39 who are single is 0.5 percent. Urban rates would be somewhat higher, but even in Beijing and Shanghai the percent of women who are single aged 30-34 in 2000 was only 3.9%.

force participation decisions primarily in the context of their families. We are particularly interested in how the presence in the household of preschool and schoolaged children and/or the elderly and the disabled affects women's likelihood of engaging in work outside the home. In addition, we are interested in how China's substantial economic reform, changing demographic environment, and shifting expectations of gendered social roles have affected these determinants. To explore the relationship between household composition and urban, married women's labor force participation in China, we have pushed and pulled and tugged at the census data in order to be able to fully characterize the family circumstance of each prime-aged, urban woman and to make our categories compatible across census years.

In Section II, we discuss a number of the factors that affect married women's participation in market work. We consider these factors in the context of China's changing economic and demographic environment. We then estimate labor force participation equations that include these factors as explanatory variables and present our findings in Section III. We focus first on the experience of prime-aged, urban, married nonmigrants in 2000. Next, we consider the change in the determinants of labor force participation over time by comparing the experience of urban, nonmigrant women in 2000 to that of their counterparts in 1982 and 1990. Finally, we investigate the determinants of married, migrant women's labor force participation and compare them to those of nonmigrant urban residents.⁷

In each of the three analyses, we consider the possibility that coresidency with elders and the presence of young child may be endogenous to the labor force participation decision of these prime-aged women. Local and provincial differences in the average rates of coresidency and spousal information provide strong identifiers to control for potential endogeneity. Using a two-stage residual inclusion method (Terza, Basu, and Rathouz 2008), we obtain results that are highly consistent with our more naïve model, which assumes exogeneity. Thus, even though we reject the assumption of exogeneity and employ a two-stage model, our qualitative results do not change. In 2000, the presence of young children in the household reduced both migrant and nonmigrant urban women's rates of labor force participation, while coresidency with elders increased these same women's labor force participation. The magnitude of the effects was larger for migrant than nonmigrant women. The 1990 census data yielded similar but smaller effects.

II. Determinants of Married Women's Labor Force Participation Rates in Urban China

In China, both the tradition of filial piety⁸ and the law⁹ oblige adult children to care for elderly parents, and, in fact, the majority of elderly Chinese

^{7.} In this analysis, we are excluding urban to urban migrants even though there are a substantial number of them. In our preliminary look at the data, the urban migrants appear to consistently fall in between rural migrants and urban nonmigrants in terms of the determinants of their labor force participation.

^{8.} Even though filial piety has been a very important element of Chinese society for thousands of years, it does not mean that care for the elderly comes about smoothly. In their study of the relationship between elderly parent health and the migration of adult children, Giles and Mu (2007) report that conflict among

(those aged 65 and older) live with their children.¹⁰ Nationwide, the percentage of the elderly men and women living with their children remained almost constant between 1982 and 1990 at 68 percent and 74 percent, respectively but declined to 60 percent and 69 percent by 2000 (Zeng and Wang 2003, Table 2). According to Zeng and Wang (2003), the decline between 1990 and 2000 is due to a noticeable decrease in the proportion of the young elderly (aged 65–79) who coresided with their children (Tables 3 and 4).

Some of the decline in coresidency among the young elderly can be attributed to the urban housing reform and subsequent boom in the availability of new residential housing,¹¹ which has enabled those with sufficient resources the possibility of independent living. Zhang (2009) reported that some urban elders perceive separate living as yielding convenience, freedom, and better control over their lives. Pension availability also has contributed to an increase in independent living.¹² Nonetheless, the predominance of family-based eldercare in China in the context of rapid population aging implies that families will soon face a profoundly increased burden of eldercare. In 2000, 20.1 percent of Chinese households had at least one member aged 65 or above, and the percentage of elderly in the population is expected to rise from 7 percent (93 million) in 2000 to 15.7 percent (235 million) in 2030 and 22.7 percent (334 million) in 2050 (Zeng and Wang 2003).

In studies using data for the United States and United Kingdom, economists have modeled the effect of elder care (sometimes proxied by coresidency) on married women's labor force participation (Heitmueller and Inglis 2007, Johnson and Lo-Sasso 2006, Carmichael, and Charles 2003, Stern 1996, Ettner 1996, Wolf and Soldo 1988). Each of the studies has found some decline in labor force participation of caregiving adult children. However, Marenzi and Pagani (2005) report that adult children in Italy often benefit from childcare services provided by parents and parents-in-law. Pezzin and Schone (1999) offer a bargaining model approach where coresidency and adult daughters' labor force participation are determined jointly with the propensity to provide informal care. In their model, as in the models of Stern (1995), Hiedemann and Stern (1999), and Checkovich and Stern (2002), the intergenerational transfer is assumed to go from adult child to elderly parents. This seems to be an accurate depiction of coresidency with elders in the United States and Western Europe. Forty-three percent of the 65–and-older population in the United

siblings over the care of the elderly was the third most important source of conflict in the 55 villages they surveyed. It was the first or second most important source of conflict in 11 of those villages (see also Zhang 2005).

^{9.} As Palmer (1995) describes, both the Article 49 of the Constitution of 1982 and Article 15 of the 1980 Marriage Law require children who have come of age to support and assist their parents. Palmer also notes that Article 183 of the 1979 Criminal Law makes it an offense punishable for up to 5 years in prison for adult children to refuse to perform their duties to their parents.

^{10.} This phenomenon is not limited to the rural population.

^{11.} The housing reforms, implemented nationally in the early 1990s, dramatically increased housing availability and ownership. Meng and Luo (2008) report that per capita residential floor space in urban China increased from 13.0 square meters in 1988 to 22.8 in 2002 and that residential housing sales increased over the same period from 255 million square meters to 2.2 billion square meters.

^{12.} There is a big gender difference in the availability of pension support amongst oldest old in urban areas. 70 percent of male octogenarians reported pension income as their main source of financial support in comparison to 26 percent of the females (Zeng et al. 2002).

States lives in married couple households, and another 45 percent live alone. Coresidency has been shown to be strongly affected by advancing parent age and parents' ADL¹³ limitations (Stern 1996, Pezzin and Schone 1999).

It is important to recognize, however, in the Chinese context that coresidence of parents and/or parents-in-law with adult children does not necessarily imply the need for eldercare.¹⁴ Coresidency can result from parent and/or child preferences or from income or housing constraints. In addition, coresident, older family members may live in the household to provide household help and care of grandchildren. Coresident grandmothers may care for preschool or school-aged children and/or do the shopping, cooking, and laundry that would facilitate younger women's employment outside the home.¹⁵ It is the very old who are most likely to need care. Given the short length of time between generations, the care of those older than 80 will fall mainly on adult children in their 50s and 60s and thus beyond the age limits of our current analysis.¹⁶ In the U.S. context, economists have investigated intergenerational transfers from parents to their adult children only for parents of young mothers. For example, Rosenzweig and Wolpin (1994) model the effect of government welfare benefits on parental transfers of money and shared residence with young adult daughters and their children. Cox and Stark (2005) provide an interesting model of exchange between generations where the older generation makes tied money transfers to their adult children to help with the down payment on a house. The purpose of the money transfer is to subsidize grandchildren because adult children with children of their own are more likely to provide informal care for their aging parents to demonstrate to their own children how they wish to be cared for.¹⁷ The idea that elders provide services that facilitate married women's employment has not been investigated in the Western context beyond the phenomena of grandmothers providing childcare.18

Other demographic changes in China that have coincided with the economic reform period also must be taken into consideration. The marked post-1970 decline in fertility implies that men and women now entering middle age have fewer siblings than previous generations, and fewer siblings implies fewer family members who

^{13.} ADL—Activities of Daily Living

^{14.} This is very different from the situation in the U.S. or Western Europe where coresidence is usually the result of growing disability or frailness on the part of the elderly parent.

^{15.} Nor, for that matter, does coresidence necessarily imply financial transfers from adult children to elderly parents. Cai, Giles, and Meng (2006) suggest to the contrary, that there is a good chance that net transfers are flowing from parents to children. In their study of how well adult children insure urban parents against low retirement incomes, they find that children living apart from parents are more likely to have four-year college educations and be employed and less likely to be ill or in school than those who live with parents. I. The prevalence of disability increases rapidly with age in the elderly Chinese population, especially for those aged 80 and above (Zeng and Wang 2003).

^{17.} This type of intergenerational quid pro quo is also suggested for Lee and Xiao (1998) in the Chinese context with the older generation providing housing or other services in exchange for current or future financial support from their adult children.

^{18.} One exception mentioned above is Marenzi and Pagani (2005), which looks at Italian extended families. Chen, Short and Entwisle (2000) consider the effect of grandparents' proximity on the time Chinese mothers spend taking care of their own children. Living with or near a child's paternal grandmother reduces the time mothers spend with their children. Coresidency with one's own mother also reduces the time mothers spend with their children.



Mean Number of Coresident Children of Married Women Aged 25–50 Data Sources: 1 percent Micro Samples of the 1982 and 1990 Population Censuses of China and the 0.095 percent Micro Sample of the 2000 Population Census of China

can help share in the provision of eldercare. If women drop out of the labor force to care for elderly or disabled parents or parents-in-law and consequently give up pension entitlements, they may find themselves substantially disadvantaged as they age. However, while the burden of eldercare is likely to rise, the number of years spent in childbearing and childrearing has fallen.

The rapid decline in the total fertility rate in urban China implies that current mothers and grandmothers are likely to spend fewer years in childcare than previous generations. However, mothers and grandmothers may devote substantially more time per child. It is possible given the reported quality/quantity childcare tradeoffs of Chinese urban households that time devoted to active childcare has increased.

Figure 4 shows the decline in the mean number of coresident children across the three census years. Coresident children cannot be considered a measure of total fertility. Many of the children of the older women (in the 25-to-50 age cohort) will be adults¹⁹ who may be living in separate households.

Married, rural-to-urban migrant women and urban women face very different environments with regard to childcare. They also differ in their fertility experience. Married, rural-to-urban migrants have more children than married, urban dwellers, but, as shown in Figure 5, they have fewer children than their rural counterparts. In addition, many rural-to-urban migrants leave their children in the rural area when

^{19.} We consider individuals age 18 and older to be adults.



Mean Number of Surviving Children of Married Women Aged 25–50 Data Sources: 1 percent Micro Samples of the 1982 and 1990 Population Censuses of China and the 0.095 percent Micro Sample of the 2000 Population Census of China

they migrate. Figure 6 compares the numbers of surviving children to coresident children for married, female, rural-to-urban migrants in 1990 and 2000. It both reveals that fertility fell between 1990 and 2000 and that the number of children left in the rural area has increased. This may be related to the increase in labor force participation of married, rural-to-urban migrant women from 1990 to 2000.

Those rural-to-urban migrants who brought their young children with them face a difficult childcare environment in urban China. Preschools are expensive and geared to urban parents. Many urban women use their parents or parents-in-law as caregivers. This level of family support may not be available to rural-to-urban migrants. Migrant women who can't convince their mothers-in-law to join them in the urban areas may choose to withdraw from the labor market to care for their young children.

For each married woman in the sample, we have created a set of indicator variables that characterize those with whom she coresides, the age distribution of children in her household, and the standard demographics of education, age, and ethnicity. When we first ran probit regressions on these household and individual variables, along with a set of dummies for the province of residence, we found very large differences among the provinces in base labor force participation rates (results not reported). In order to explore the nature of these differences, we also have created a set of contextual variables at the prefecture and provincial levels. These variables are intended to capture differences in labor market opportunities, the general health of the local economy, and differences in expectations about gender roles. The vari-



Coresidency of Migrant Mothers and Their Children in 1990 and 2000 (of Mothers in Family Households)

Data Sources: 1 percent Micro Sample of the 1990 Population Census of China and 0.095 percent Micro Sample of the 2000 Population Census of China

ables for provincial level per capita urban income and the growth rates of annual GDP over the previous five years were obtained from the statistical yearbooks and a compendium of GDP statistics released by the State Statistical Bureau. We calculated the prefectural variables from the census data itself—the unemployment rate by aggregating unemployment information for all prefectural residents, the infant sex ratio for all infants in the prefecture, the difference in sex-specific rates of illiteracy for all prefectural residents, and the percent of Muslims in the prefecture's population. We created the latter three prefectural variables to explore differences in gender roles or gender power across regions. As will be shown below, these contextual variables are significant predictors of prime-aged, urban women's labor force participation. They do not explain all of the provincial differences, but do reduce them substantially. More importantly, the demographic effects, discussed below, prove to be extremely robust with respect to the specification of the provincial and/or contextual variables.

In creating coresidency and child variables, we seek to capture the impact that other family members may have on the time use and income demands of primeaged women. The presence of older coresidents could mean that the prime-aged women have additional caregiving responsibilities, which would be expected to lower their labor force participation rates.²⁰ Alternatively, older household members might help out with household chores and thus facilitate the labor force participation of prime-aged women. In addition, older household members might contribute income to the household, reducing the income motivation of prime-aged women to participate in market work or, alternatively, require expensive medical care and increase the incentive for prime-aged women to contribute earnings to the household. Thus, we hypothesize that coresidency with older household members will affect women's labor force participation but are unable to predict the direction of the effect. We expect, however, that the oldest coresidents will contribute less to the household and need more care, whether financial or physical. As such, we have included three separate coresidency indicators: coresidency with parents or parents-in-law, coresidency with a person aged 75 or above, and coresidency with a disabled person less than 65 years of age. We also control for the number of adults in the household.

In most countries, the labor force participation rates of married women with children, especially those with young children, are substantially lower than those of their childless counterparts. We thus characterize women's households by the age of the youngest children. We divide children into four age categories with differential time and income needs: preschoolers, aged 0 to 5, who must be watched at all times; young school-aged children, aged 6 to 12, who still need "watching" and delivering to and from school; older school-aged children, aged 13 to 15, who are still in compulsory education; and those aged 16 to 17 whose school fees, if they are in school, are substantially higher. As with coresidency with elders, the presence of children in the household may indicate increased demand for time, leading to reduced labor force participation or increased demand for money income to cover school and other children-centric expenditures, leading to increased labor force participation. We divide women with no coresident children into those younger than age 40 and those aged 40 and older. The latter group is quite likely to have adult children.²¹ In our regression models, we use the presence of a coresident child aged 6 to 12 as the base case. Thus, the effects of having no coresident children or younger or older coresident children are presented as relative to the effects of having one's youngest child of elementary school age.

China's economic reforms and increased openness 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 raised the opportunity cost of not working. However, 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 reemergence of traditional patriarchal values (Croll 1995; Entwisle and Henderson 2000). This retreat, combined with growing pressure to reduce the size of the state-

^{20.} This is what we would expect if the context of our analysis were a "Western" country. Liu and Dong (2008) using data from urban China find that caring for parents does not affect the labor force participation or labor supply of married women but that caring for parents-in-law negatively affects both of these measures. The questionnaire their data are based on asked explicitly if elder care was provided.

^{21.} Adult children may continue to live in the same households as their mothers. However, we count all members of the household of age 18 and older as adults.

owned enterprise work force, put pressure on women, especially older women, to leave the labor force and return to more subordinate roles. Increased workplace discipline and required effort levels also made it more difficult for some working women to cope with household responsibilities, thereby raising the costs of labor force participation, particularly for married women with young children.

Education is increasingly rewarded in the Chinese workplace. Studies of the rate of return based on 1981, 1985, and 1986 data all reported very low rates of return. For example, Meng and Kidd (1997), using data from 1981 for more than 25,000 men in the state-owned sector, found a rate of return of 2.5 percent. Maurer-Fazio (1999), using data from 1989 and 1992, also found low overall rates of return to education but higher rates for younger workers, indicating that the urban Chinese labor markets had begun to change. Maurer-Fazio and Dinh (2004), employing data from 1999, found higher rates of return, especially among reemployed workers who competed for their jobs (as opposed to being assigned to a post). Zhang et al. (2005) reported that rates of return to education for urban women increased from 5.2 in 1988 to 12.5 in 2001. We, thus, expect to observe a positive relationship between level of education and labor force participation. In addition, the number of slots available in higher education has increased, leading to an increased average level of education among prime-aged women. Illiteracy also may take on a different meaning over the three censuses as the level of primary school initiation rose during this period (Connelly and Zheng 2007).

The restructuring of the state-owned sector in the latter half of the 1990s led to the layoff of many millions of urban workers. Extended periods of layoff led, in turn, to withdrawal from the labor force of some of these workers.²² The layoffs appeared to fall disproportionately on women and older workers (Giles, Park, and Cai 2006; Maurer-Fazio 2006). It is difficult to distinguish between layoff-related withdrawals and withdrawals motivated by increasing opportunity costs of time. It is our hope that comparing the determinants of labor force participation in these three periods (1982, which predates the majority of urban reforms; 1990, which is early on in the economic reform period when the market was still largely but not completely regulated and when rapid changes were leading to tremendous uncertainty about the future; and 2000, when a market-based labor market was much more firmly established) will allow us to argue that not all of the decrease in urban women's labor force participation and spousal education are increasingly related to labor force participation.

We expect that some labor market withdrawal is positively correlated with household income. Rising incomes of spouses and/or other household members can be viewed as an income effect for married women. This would allow some individuals to withdraw from the labor force when their spouses' earnings met household income goals. We thus included spouse's education as a proxy for spouse's income.

Maurer-Fazio, Hughes, and Zhang (2007, 2009) explore whether China's reforms differentially affected the labor force participation of China's minority ethnic groups and the Han majority. They find that Muslim Hui women have significantly lower

^{22.} This phenomenon is often referred to as the discouraged worker effect.

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rates of participation than Han women. Given the high degree of assimilation of the Hui into Han society (relative to other ethnic minority groups), they argue that it would be difficult to attribute this finding to discrimination. They believe this effect to be a robust cultural or religious difference that surfaced with the relaxation of state control over individuals' lives. We explore this issue further by both controlling for those belonging to China's Muslim ethnic groups and controlling for the share of Muslims in prefectural population.

Finally, we control for the location of residency—living in a city versus living in a town. The rate of change in the economy has been uneven with city labor markets emerging first. There are often very different regulations in towns versus cities, as the largest cities are trying to discourage in-migration while some towns may welcome it.

III. Results

We estimate probit regressions on women's labor force participation, controlling for the many individual, household, and contextual factors discussed above. The census data identify individuals as members of households, which are classified as either family or collective. The data indicate an individual's relationship to the head of household. We are able to use this information to match mothers' data to that of their coresident children in at least 97.5 percent of households in each of the three census years. We are unable to match mothers and children in collective households and in a small number of particular forms of multigeneration extended family households. We have dropped such cases from the analysis. As previously indicated, for each married woman in the sample, we have created a set of indicator variables that characterize those with whom she coresides, the age distribution of the children in her household, the standard demographics of education, age, and ethnicity, and a number of contextual variables.

Defining urban and rural in the Chinese censuses is a nontrivial endeavor. Our strategy differs by census year. For 2000, we used a variable from the census questionnaire that designated an individual's location as city, town, or rural. We combined the city and town designations into an urban category. For 1990, we used a similar census variable. However, that variable was defined for each individual's usual place of residence five years before the census. For women who had not moved from that location by the time of the census, the majority of our sample, we once again added the city and town categories together to get urban. For those who had moved, we used the city, town, rural classification of nonmovers at the new location to assign the rural urban status of the movers. We were unable to use a similar strategy for the 1982 sample and had to rely on administrative location codes for that year's data. Fortunately, the administrative county codes differentiate the districts administered by cities from those administered by rural counties, and we were able to use this distinction to classify individuals' locations as rural or urban.

A. Prime-Aged, Married Women: Nonmigrant Urban Residents in 2000

Column 1 of Table 1 presents the results obtained from our most recent data, that is, the data of the 2000 census. The sample includes married, nonmigrant women

between the ages of 25 and 50, living in family households in urban areas. The mean of each explanatory variable is presented in the second and fourth columns of the table. Marginal effects are presented to help facilitate interpretation. Since our nonmigrant sample sizes are quite large, we have chosen a level of significance of 1 percent for hypothesis testing.

We find that coresidency matters, but not in the same ways that it does in U.S. or U.K. data. We find that coresidency with older adults increases prime-aged women's labor force participation rates. We had anticipated that the increasing life expectancy of the elderly might increase the burden of caregiving on prime-aged women. By 2000, the choice of the urban elderly to live or not live with adult children was much less constrained by a shortage of housing than in earlier years. Given the easing of housing constraints, we expected that by 2000, elderly coresidents would be increasingly composed of the frail elderly. We thus expected primeaged women to experience an increased burden of care provision, and be less likely to participate in market work. However, we found, on the contrary, that having a person aged 75 and above in the household had no significant effect on the labor force participation rate of married, nonmigrant, urban women. Having a coresiding parent or parent-in-law increased women's participation by 6.6 percentage points.²³ On the other hand, living with a disabled person (younger than age 65) had a large negative effect on labor force participation-it reduced married women's participation by 8.1 percentage points. The difference in the effect of coresidency with a disabled person from that of a parent or parent-in-law strongly suggests that parents and parents-in-law were providing help in the household that facilitated women's employment. This corresponds to the finding of Lee and Xiao (1998) that elderly Chinese in urban areas often provide help in the form of housing and other services to their adult children in order to receive financial support either at the same time or in the future. Alternatively, the increase in labor force participation may be related to an increased need for income to help pay for healthcare for these coresiding elders. Coyne et al. (2002) found that the self-pay portion of medical costs in China had increased from 45 percent to 68 percent from 1989 to 1999.

We are also especially interested in the effect that children have on urban women's labor force participation in 2000. We divided all women aged 25 to 50 into six mutually exclusive categories: women (younger than 40) without children present, those whose youngest child is aged 0 to 5, those whose youngest child is aged 6 to 12, those whose youngest child is aged 13 to 15, those whose youngest child is aged 16 to 17, and older women (40 to 50) with no children in the household. We believed it important to divide the "no child at home" category into younger and older women since women in the younger group were more likely to be childless, while women in the older group were more likely to have grown children to reflect the differing in-

^{23.} This effect was quite robust to age cutoff. We initially used 65 as an age cutoff and then tried 70 and 75 thinking that we would be able to isolate the care-needing group. We present the results for the 75 + group since this is the group we would most have expected to need care.

^{24.} When we expand our analysis to rural-to-urban migrant women, the younger women with no children present will also include many women who have left their children in the rural areas and migrated without them. This means that this group will be quite different from the urban women without children in age but age is broadly controlled for in the regression model.

| | Exogenous Equation | Single Model | Two-Stage Inclusion | Residual Model |
|---|-----------------------|-----------------|------------------------|-------------------|
| Explanatory Variables | dF/dx | x-bar | dF/dx | x-bar |
| Coresidencies: | | | | |
| Coresident with parents/parents in-law | 0.066^{***} | 0.177 | 0.122^{***} | 0.177 |
| Coresident with person aged 75 or above | 0.004 | 0.040 | 0.132^{***} | 0.040 |
| Coresident with a disabled person aged less than 65 | -0.081^{***} | 0.013 | -0.084^{***} | 0.013 |
| Number of adults in the household | -0.002 | 2.575 | -0.035^{***} | 2.576 |
| CIIIIucare: | | | | |
| No children in household, woman age ≤ 39 | -0.007 | 0.042 | -0.006 | 0.042 |
| Youngest coresident child aged 0 to 5 | -0.042^{***} | 0.208 | -0.060^{***} | 0.208 |
| Base case: youngest coresident child aged 6 to 12 | | | | |
| Youngest coresident child aged 13 to 15 | 0.005 | 0.131 | 0.004 | 0.131 |
| Youngest coresident child aged 16 to 17 | -0.002 | 0.035 | -0.003 | 0.065 |
| No children in household, woman age ≥ 40 | -0.052^{***} | 0.206 | -0.047^{***} | 0.206 |
| Education Level: | | | | |
| Illiterate | -0.023^{**} | 0.032 | -0.012 | 0.032 |
| Primary | 0.009^{**} | 0.205 | 0.011^{***} | 0.205 |
| Base case: junior middle | | | | |
| Senior middle | 0.088^{***} | 0.251 | 0.087^{***} | 0.251 |
| Post secondary | 0.203^* | 0.085 | 0.203^{***} | 0.035 |
| Age Categories: | | | | |
| Base case: age 25–29 | | | | |
| Age 30–34 | 0.017^{***} | 0.221 | 0.008 | 0.221 |
| Age 35–39 | 0.021^{***} | 0.222 | 0.008 | 0.222 |
| Age 40–44 | -0.002 | 0.184 | -0.009 | 0.184 |
| A 28 15 50 | -0.118^{***} | | 0 111 *** | |

Table 1 Maroinal Effec

| Spouse's Eduction: | | | | |
|--|----------------|--------|----------------|--------|
| Spouse illiterate | -0.005 | 0.008 | -0.003 | 0.008 |
| Spouse primary | 0.023^{***} | 0.147 | 0.024^{***} | 0.147 |
| Base case: spouse junior middle | | | | |
| Spouse senior middle | 0.000 | 0.265 | 0.000 | 0.265 |
| Spouse post secondary | 0.046^{***} | 0.144 | 0.048^{***} | 0.144 |
| City/Town Location: | | | | |
| Resides in a city | 0.000 | 0.597 | 0.001 | 0.597 |
| Muslim Effect: | | | | |
| Belongs to Muslim ethnic group | -0.051^{***} | 0.014 | -0.050^{***} | 0.013 |
| Percent of Muslims in prefectural population | 0.000 | 1.270 | 0.000 | 1.238 |
| Other Prefectural Variables: | | | | |
| Prefectural unemployment rate | -0.011^{***} | 4.624 | -0.011^{***} | 4.631 |
| Prefectural infant sex ratio | -0.008^{*} | 1.233 | -0.009^{**} | 1.233 |
| Prefectural sex difference in illiteracy rate | 0.002^{***} | 10.419 | 0.002^{***} | 10.402 |
| Provincial Income Variables: | | | | |
| Provincial urban real per capita income (100 yuan) | 0.004^{***} | 64.395 | 0.004^{***} | 64.404 |
| Provincial urban real per capita income squared | 0.000^{***} | 4454.7 | 0.000^{***} | 4455.3 |
| Provincial annual real GDP growth rate over previous 5 years | 0.007^{***} | 9.090 | 0.006^{***} | 9.092 |
| Residuals: | | | | |
| Coresident with parents/parents in-law residuals | | | -0.087^{***} | 0.005 |
| Coresident with person aged 75 or above residuals | | | -0.165^{***} | 0.000 |
| Youngest coresident child aged 0 to 5 residuals | | | 0.019 | 0.000 |
| Observed P | 0.773 | | 0.773 | |
| Predicted P | 0.796 | | 0.797 | |
| Number of observations | 62,846 | | 62,712 | |
| LR chi2 | 5,439 | | 5,492 | |
| Prob > chi2 | 0.000 | | 0.000 | |
| Pseudo R2 | 0.081 | | 0.082 | |
| Log likelihood | -30,944 | | -30,835 | |
| | | | | |

Data Sources: The 0.095% Micro Sample of the 2000 Population Census of China Significance Levels: *** significant at 1%; ** significant at 5%; * significant at 10%;

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stitutions of Chinese urban education: preschool, elementary school, middle school (still mandatory but highly competitive in placement) and high school (not compulsory).

Our results show that young women with no children at home have the same predicted labor force participation rate as those with elementary school-aged children. However, the older women with no coresident children younger than age 18 have significantly lower labor force participation rates. Since we also controlled for age, the lower labor force participation rate of these older women with no coresident children younger than 18 is an interesting finding that bears further investigation. These older women with grown children may well be discouraged workers, but it is interesting to note that the women with children aged 16 to 17 (many of whom are also older than 40) are less discouraged. Tuition bills and other educational expenses may be acting as a strong motivation to stay in the labor market.

One of the most interesting findings of Column 1 of Table 1 is that the presence of preschool children in the household reduced the labor force participation of their mothers by 4.2 percentage points compared to those married women with slightly older children. That this effect is typically larger in Western economies is less interesting than the fact that young children had any negative effect on labor force participation in urban China. Under the planned labor market in prereform China, women would be absent from the workplace for a number of months before and after the birth of a child but still considered employed. The effect of young children. The presence of children aged 13 to 15 and those aged 16 to 17 are statistically insignificant compared to the presence of the young school children (aged 6–12), the omitted category.

Column 1 also reveals that education had a monotonically increasing effect on labor force participation. In comparison to women with junior high school educations, illiterate women were 2.3 percentage points less likely to be in the labor force (p-value 0.017) while those with senior high school educations and postsecondary educations were 8.8 and 20.3 percentage points more likely, respectively.

Within the age range of 25–50, age increased participation slightly until age 39. Women aged 40 to 44 have participation rates equal to those of women aged 25–29 (having controlled for coresidence and presence of young children). After age 44 we observe a large and significant reduction in labor force participation. Women age 45–50 were 11.8 percentage points less likely to be in the labor force that those aged 25–29. This result is consistent with the sense that women were being forced into early retirement. It is, however, also consistent with the hypothesis that some women of this age group were "voluntarily" withdrawing from the labor force to provide care for their grandchildren.

Spouse's education did not have the negative effect on women's labor force participation that might be expected if spouse's education was simply a proxy for spousal income. Women whose spouses had either primary education or postsecondary education were 2.3 and 4.6 percentage points more likely to be in the labor force, respectively, than those whose spouses had junior or senior middle school educations. The former may indicate more severe income constraints leading to a push to stay in the labor market longer, while the latter could be the result of positive assortative mating where more capable women marry more capable men and these capable women remain in the labor market longer.

The Muslim effect on labor force participation, 5.1 percentage points, was negative and significant. The value falls between the -3.5 and -12.0 percentage-point effects for Hui and Uygur women reported in Maurer-Fazio, Hughes, and Zhang (2009).²⁵ While the individual effect of being Muslim was negative and significant, living in a prefecture with a larger Muslim share had no significant effect on labor force participation.

Prefectural level unemployment rates and sex difference in rates of illiteracy had significant but quantitatively small effects on women's labor force participation. Women who lived in a region with higher unemployment had lower rates of labor force participation, indicating a discouraged worker effect for some women. The illiteracy differential (along with the sex ratio) was designed to capture difference in the status of women in the region. Those regions with higher gender differences in rates of illiteracy had slightly higher rates of married women's labor force participation. Similarly, the provincial-level variables of urban per capita income and the growth rate of GDP over the previous five years both affected women's labor force participation in very muted ways.

One possible criticism of the estimation procedure used to produce Column 1 of Table 1 is that all coresidency and child presence variables are assumed to be exogenously determined. An alternative approach would be to model the presence of others in the household along with labor force participation. While the charge of potential endogeneity can be leveled at almost any variable in a household decision making model, we believe some charges should be taken more seriously than others.²⁶ In China, even in urban China in the 1990s, strong familial pressure to have at least one child²⁷ made the "decision" to have a child for most women to effectively a "nondecision," exogenous to labor force participation. In the 2000 Census, we find that only 3.1 percent of the urban, nonmigrant, married women aged 40 to 50 report never having had a child. However, the timing of fertility is clearly a matter of choice, so we explore the potential endogeneity of the presence of children aged 0 to 5.²⁸ Similarly, although there are strong normative and even legal requirements that adult children provide care for elderly parents, there is still choice involved as to whether care provision involves coresidency and with which child an elder resides. Thus, we might expect coresidency with a parent or parent-in-law and coresidency with an elder 75 years or older to be jointly determined with women's labor force participation as modeled in Ettner (1996), Pezzin and Schone (1999), Stern (1995), Hiedemann and Stern (1999) and Checkovich and Stern (2002).

^{25.} The Hui and Uygur ethnic groups constitute the vast majority of China's Muslim population.

^{26.} Connelly et al. (2006) argues that endogeneity should not be a yes or no concept and that researchers need to think about tradeoffs between omitted variable bias and endogeneity bias. They argue more attention should be paid to decisions made closer in time with one another and decisions in which more choice is involved. It is in that spirit that we have chosen to focus our attention on the potential endogeneity of the presence of young children and the coresidence with parents and elders.

^{27.} This pressure is countered by China's strict birth control policies, which prohibit most urban families from having more than one child.

^{28.} For rural-to-urban migrant women, decisions about whether to bring their young children with them to urban areas clearly should be thought of as (potentially) jointly determined with labor force participation.

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In order to explore the assumptions of exogeneity implicit in Column 1 of Table 1, we estimated three preliminary equations that predict the presence of the youngest children, the presence of parents and parents-in-laws and the presence of an elder (aged 75 and older) in the household. For each equation we have very strong instruments, particularly the percent of households in the prefecture who have coresident parents and/or parents-in-law and coresidents older than age 70, the woman's exact age, her husband's exact age, a set of interactions between the woman's age and her husband's age with higher order terms, and a full set of provincial dummies.²⁹

In each case, the potential identifiers were significant with strong predictive powers. Overall, our instruments have partial F values of 6,991 in the first-stage equation on the presence of parents or parents-in-laws, 892 in the equation on the presence of those 75 years of age or older, and 16,823 in the equation on the presence of a youngest child age 0 to 5. These values are very high, leading us to feel confident, based on Staiger and Stock (1997), that we do not need concern ourselves with the asymptotic properties of weak instruments.

Having estimated the first-stage equations, for each woman in our sample, we calculate the residuals as the difference between her observed value of the presence of parents, elders or young children and the predicted values of the presence of parents, elders or young children. Then, following Terza, Basu, and Rathouz (2008), we include these residuals, along with the original observed values of these variables, in the labor force participation model specification. This two-stage residual inclusion method has been shown by Terza, Basu, and Rathouz to produce consistent estimates of the potentially endogeneous variables. This method is preferred to models that include the predicted values for nonlinear functional forms such as the probits we estimate.

Column 3 of Table 1 shows that the marginal effects of the three "corrected" variables are consistent in sign to those in Column 1. The marginal effects on coresidence with parents or parents-in-law and coresidence with any person aged 75 or above are significantly larger than in the model that assumed exogeneity. The marginal effect on the presence of a young child is statistically unchanged by the "correction."³⁰ The marginal effects on other variables reported in Column 3 are completely consistent with the results reported in Column 1 with almost no changes in magnitudes although there are some interesting changes in significance. Still, the basic findings reported above hold: coresidence with parents or parents-in-law and coresidence with any person aged 75 or above increased prime-age, urban, nonmigrant, married women's labor force participation while the presence of a young child aged 0 to 5 decreased these same women's labor force participation. The age differentials became less important once the endogeneity of the presence of young children and the presences of elders in the household was accounted for. In contrast,

^{29.} In the subsequent section that compares migrant women's labor force participation to that on nonmigrant women, we use a set of instruments that is almost identical. However, instead of provincial dummies for the women's location at the time of census enumeration, we use a set of provincial dummies for the women's usual residential location five years before the census. Results for the preliminary estimation equations are available upon request.

^{30.} Based on the t-tests for the differences in the underlying coefficients at the 5 percent level.

the negative effect number of adults in the household became significant in the twostage residual inclusion model. The marginal effects on the residual terms for the presence of parents or parents in law and the presence of elders (75 and older) were significant and negative. This indicates that characteristics correlated with the choice to coreside, reduced urban women's labor force participation. In contrast, the marginal effect of the residual term on the presence of young children was not significant, indicating that fertility timing was not correlated with labor force participation.

B. Are These Effects New? Comparing the Household and Personal Demographic Effects on Labor Force Participation over Time

Table 2 reveals that the household and personal demographic effects discussed above were not new. However, they grew somewhat in magnitude over the time period under consideration, which seems in keeping with the hypothesis that choice about labor force participation was increasing. The results for 2000 are the same two-stage residual inclusion model results as were presented in Table 1, Column 3.³¹

Coresiding with parents and/or parents-in-law had a statistically similar impact on labor force participation in 2000 and 1990 and a statistically greater impact than it did in 1982. In all three years the effect was significant and positive. It is interesting to note that the percent of married, urban women living with parents or parents-inlaw remained constant at 18 or 19 percent over the 18-year period. Coresidence with the elderly had a negative effect on women's labor force participation in 1982, but the effect became positive in 1990 and stayed so in 2000. The positive effect in 2000 was significantly larger than the 1990 effect, 13 percentage points compared to four percentage points. Living with a disabled person became a significantly less negative factor between 1982 and 1990, moving from negative 14.2 percentage points in 1982 to negative 7.5 percentage points in 1990. The estimated marginal effect in 2000 is -8.4, which is not statistically different from the 1990 effect. We can say that in each of these categories the general trend over time was toward increased labor force participation. That this result holds for the disabled as well as parents and the elderly suggests the need for increased household income (perhaps to cover increased medical expenses) was playing a role.

The comparisons made available to us in Table 2 reveal that having preschool children in the household increased women's labor force participation in the prereform, urban, labor environment of 1982. By 1990, this effect became negative and was significantly different from the 1982 level. Between 1990 and 2000 the magnitude of the point estimates increased from negative 3.2 percentage points in 1990 to negative 6.0 percentage points in 2000 though these values are not statistically different from one another.³² The change from positive effect in 1982 to a negative

^{31.} In Table 2, we compare results for 1982, 1990, and 2000 from the two-stage residual models, which provide consistent estimates that correct for the potential endogeneity of coresidence and the timing of the birth of the youngest children.

^{32.} The finding of a negative effect of preschool children on nonmigrant women's labor force participation in 1990 would be the same if we had reported the results of the exogenous model instead of the 2SRI model.

| | 1982 | | 199(| | 2000 | |
|---|----------------|-------|----------------|-------|----------------|-------|
| Exnlanatory Variables | dF/dx | x-har | dF/dx | x-har | dF/dx | x-har |
| Commenter Commenter | 1700 1 100 | - | | | | |
| Coresidencies: | | | | | | |
| Coresident with parents/parents in-law | 0.085^{***} | 0.167 | 0.076^{***} | 0.167 | 0.122^{***} | 0.177 |
| Coresident with person aged 75 or above | -0.068^{***} | 0.038 | 0.042^{***} | 0.040 | 0.132^{***} | 0.040 |
| Coresident with a disabled person aged less than 65 | -0.142^{***} | 0.012 | -0.075^{***} | 0.008 | -0.084^{***} | 0.013 |
| Number of adults in the household | -0.024^{***} | 2.838 | -0.026^{***} | 2.659 | -0.035^{***} | 2.576 |
| Childcare: | | | | | | |
| No children in household, woman age ≤ 39 | 0.011^{**} | 0.056 | 0.000 | 0.040 | -0.006 | 0.042 |
| Youngest coresident child aged 0 to 5 | 0.047^{***} | 0.373 | -0.032^{***} | 0.346 | -0.060^{***} | 0.208 |
| Base case: youngest coresident child aged 6 to 12 | | | | | | |
| Youngest coresident child aged 13 to 15 | 0.017^{***} | 0.088 | -0.002 | 0.107 | 0.004 | 0.131 |
| Youngest coresident child aged 16 to 17 | 0.002 | 0.044 | -0.001 | 0.058 | -0.003 | 0.065 |
| No children in household, woman age ≥ 40 | -0.018^{***} | 0.089 | -0.021*** | 0.093 | -0.047^{***} | 0.206 |
| Education Level: | | | | | | |
| Illiterate | -0.156^{***} | 0.216 | -0.091^{***} | 0.117 | -0.012 | 0.032 |
| Primary | -0.090^{***} | 0.325 | -0.055^{***} | 0.282 | 0.011^{***} | 0.205 |
| Base case: junior middle | | | | | | |
| Senior middle | 0.036^{***} | 0.123 | 0.063^{***} | 0.228 | 0.087^{***} | 0.251 |
| Post secondary | 0.055^{***} | 0.028 | 0.091^{***} | 0.036 | 0.203^{***} | 0.085 |
| Age Categories: | | | | | | |
| Base case: age 25–29 | | | | | | |
| Age 30–34 | 0.032^{***} | 0.217 | 0.008^{***} | 0.230 | 0.008 | 0.221 |
| Age 35–39 | 0.052^{***} | 0.168 | 0.014^{***} | 0.229 | 0.008 | 0.222 |
| Age 40–44 | 0.059^{***} | 0.175 | 0.001 | 0.159 | -0.009 | 0.184 |
| Age 45–50 | -0.013^{**} | 0.195 | -0.074^{***} | 0.142 | -0.111^{***} | 0.207 |

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| Spouse's Education: Spouse illiterate | -0.036^{***} | 0.082 | -0.039^{***} | 0.038 | -0.003 | 0.008 |
|--|----------------|--------|----------------|--------|----------------|--------|
| Spouse primary | -0.026^{***} | 0.336 | -0.019^{***} | 0.241 | 0.024^{***} | 0.147 |
| Base case: spouse junior middle | | | | | | |
| Spouse senior middle | 0.010^{***} | 0.146 | 0.017^{***} | 0.245 | 0.000 | 0.265 |
| Spouse post secondary | 0.031^{***} | 0.070 | 0.044^{***} | 0.088 | 0.048^{***} | 0.144 |
| City/Town Location: | | | | | | |
| Resides in a city | | | 0.039^{***} | 0.414 | 0.001 | 0.597 |
| Muslim Effect: | | | | | | |
| Belongs to Muslim ethnic group | -0.020^{***} | 0.017 | -0.037^{***} | 0.014 | -0.050^{***} | 0.013 |
| Percent of Muslims in prefectural population | -0.001^{***} | 1.600 | 0.000 | 1.380 | 0.000 | 1.238 |
| Other Prefectural Variables: | | | | | | |
| Prefectural unemployment rate | -0.020^{***} | 1.590 | -0.019^{***} | 1.246 | -0.011^{***} | 4.631 |
| Prefectural infant sex ratio | 0.035^{***} | 1.083 | 0.116^{***} | 1.119 | -0.009^{**} | 1.233 |
| Prefectural sex difference in illiteracy rate | 0.001^{***} | 20.402 | | | 0.002^{***} | 10.402 |
| Provincial Income Variables: | | | 0.002^{***} | 16.157 | | |
| Provincial urban real per capita income (100 yuan) | -0.001 | 18.933 | 0.012^{***} | 29.193 | 0.004^{***} | 64.404 |
| Provincial urban real per capita income squared | 0.000^{***} | 382.2 | 0.000^{***} | 902.7 | 0.000^{***} | 4456.3 |
| Provincial annual real GDP growth rate over previous 5 | 0.009^{***} | 9.144 | -0.007^{***} | 5.948 | 0.006^{***} | 9.092 |
| years | | | | | | |
| Kestquals: | *** | 1000 | ***0/00 | | *** | 0.005 |
| Coresident with parents/parents in-law residuals | -0.082 | 0.004 | -0.068 | 0.000 | -0.08/ | CUU.U |
| Coresident with person aged 75 or above residuals | 0.044 | 0.000 | - 0.00 - | 0.000 | -0.160 | 0.000 |
| roungest corestaent chita agea o to o restauats | <u>cou.u</u> – | 0.000 | cuu.u – | 0.000 | 0.019 | 0.000 |
| Observed P | 0.867 | | 0.870 | | 0.773 | |
| Predicted P | 0.909 | | 0.907 | | 0.797 | |
| Number of obs | 188,031 | | 213,913 | | 62,712 | |
| LR chi2 | 26,262 | | 24,325 | | 5,492 | |
| Prob > chi2 | 0.000 | | 0.000 | | 0.000 | |
| Pseudo R2 | 0.179 | | 0.147 | | 0.082 | |
| Log likelihood | -60,423 | | -70,546 | | -30,835 | |
| | | | | | | |

Data Sources: 1% Micro Samples of the 1982 and 1990 Population Censuses of China and the 0.095% Micro Sample of the 2000 Population Significance Levels: *** significant at 1%; ** significant at 10%

effect in 1990 and 2000 is a strong indication of substantial changes in the voluntary nature of labor force participation in the post-reform urban labor market.

The effect of having no children at home and being older than 40 is negative in all three years and does not differ significantly across the years. In 1982, married women in that category had a labor force participation rate 1.8 percentage points lower than women with school-aged children. The direct effect of age on labor force participation at the oldest age cohort was also negative in 1982, but significantly smaller in magnitude than in 1990, which was not significantly different from that of 2000. Thus, we find that, while older urban women had lower participation rates than younger women in the prereform period, the economic reforms seem to have exacerbated the withdrawal of women older than aged 40 from the labor force.

We also find a large change across the years is in the effect of education on labor force participation.³³ In 1982, illiteracy had a large negative effect on prime-aged women's labor force participation, while higher levels of education had only small positive effects. By 2000, the labor force participation rate of illiterate women was no different from that of those with a middle school diploma, and there was a very large positive effect on labor force participation. This result, while consistent with increasing rates of return to education, also might have been related to changes in the type of jobs available by education level and the differential retirement age for women with higher education.

Being a member of one of China's Muslim ethnic groups had a negative twopercentage-point effect on women's labor force participation in 1982, a negative 3.7-percentage-point effect in 1990 and a negative five-percentage-point effect in 2000.³⁴ Again, the changes over time were not large but the increase in magnitude is consistent with others highlighted above that point to an increase in discretion regarding participation in market work for urban, prime-aged, nonmigrant, married women.

The effects of regional and provincial variables that were shown to be significant predictors of married urban women's labor force participation in 2000 also played a role in the labor force participation decisions of married women in 1990 and 1982. The infant sex ratio and sex difference in illiteracy, both designed to capture the status of women in the region, show that more regional inequality of treatment was associated with higher rates of labor force participation in 1990 and 1982. The magnitude of the effect of infant sex ratio was significantly higher in 1990 and may be more related to regional differences in the availability of sonogram³⁵ machines than it is related to cultural norms of son preference. By 2000, this variable is no longer a significant determinant of women's labor force participation, which could be related to the enormous increase in the availability of these machines throughout China. In all three years, urban per capita income of the province positively affected

^{33.} The work of Zhang et al. (2005) and Maurer-Fazio and Dinh (2004) demonstrate increasing rates of return to education,

^{34.} The difference between 1982 and 1990 is statistically significant, while the difference between 1990 and 2000 is not—according to a t-test of the difference in the coefficients at the 5 percent level.

^{35.} Sonogram machines allowed parents to gain information about the sex of their unborn children and increased the prevalence of sex-preference based abortions.

labor force participation rates via the linear and/or the quadratic term. The effect of the annual real GDP growth rate over the previous five years was positive in 1982, negative in 1990 and positive again in 2000.

C. How Does Married Migrant's Labor Force Participation Differ from Urban Nonmigrants?

In this section, we compare the determinants of labor force participation of the married, prime-aged, rural-to-urban migrants enumerated as living in urban areas to those of the married, prime-aged, urban nonmigrants highlighted thus far. Although the percent of rural-to-urban migrants enumerated in the urban areas is much smaller in 1990, the total sample size available to us is large enough that we have a substantial number of married female migrants to analyze.³⁶

Table 3 repeats the urban nonmigrant columns for 1990 and 2000 from Table 2 and adds the sample of married rural-to-urban migrants. Again, we are particularly interested in the coresidency and presence of young children variables. These statuses are more likely to be deliberate choices for the migrant sample. Coresidency with parents or parents-in law was somewhat less common among the migrants, but still 13 percent of the migrants coresided with parents or parents-in-laws in 1990 and 9 percent in 2000. Coresidency with parents or parents-in-law had a large employment facilitating effect on migrant women. The labor force participation of rural-to-urban migrants was 22.3 percentage points higher in 1990 if they coresided with a parent or parent-in-law and 27.0 percentage points higher in 2000.³⁷ On the other hand, coresiding with an elder had no significant effect on migrant labor force participation in either year. Thus, it appears that coresident parents and parents-in-law greatly facilitated migrant women's labor force participation but that having coresident elders was neutral on labor force participation.

A noteworthy statistically significant difference between rural-to-urban, married migrants and urban, married nonmigrants in 2000 is that the effect on labor force participation of being below 40 and having no children was substantially greater in magnitude for rural-to-urban migrants than for nonmigrant women. Young migrant women with no coresident children were 14.2 percentage points more likely to be in the labor force than migrant women with coresident school-aged children, There was no significant difference between those with no children and those with school-aged children among nonmigrants. For both rural-to-urban, married migrants and urban, married nonmigrants in 2000, the effect of preschool children relative to school-aged children on labor force participation was negative and significant. The difference in the effect of having 16–17-year-old children in the household on migrants and nonmigrants labor force attachment was also statistically significant. It increased the labor force attachment of migrants compared to those with young school-aged children. No such differential was found for nonmigrants. Together these

^{36.} We have omitted the group of women who are urban migrants—those who had urban registration status but lived in locations that differed from that on their registration. They appear to be intermediaries between the two groups highlighted here. About 12 percent of urban women in 2000 were urban migrants 37. The magnitude of these effects is larger than it was in the exogenous model but, the significance and the direction of the effects are unchanged.

| | | Rural N | Aigrants | | | Nonmi | grants | |
|--|----------------|---------|----------------|-------|----------------|-------|----------------|-------|
| | 199(| (| 200 | (| 1990 | | 2000 | |
| Explanatory Variables | dF/dx | x-bar | dF/dx | x-bar | dF/dx | x-bar | dF/dx | x-bar |
| Coresidencies: Coresident with parents/parents in-law | 0.223^{***} | 0.126 | 0.270^{***} | 0.086 | 0.076^{***} | 0.167 | 0.122^{***} | 0.177 |
| Coresident with person aged 75 or above | -0.160 | 0.025 | 0.183 | 0.016 | 0.042^{***} | 0.040 | 0.132^{***} | 0.040 |
| Coresident with a disabled person aged less than 65 | -0.116 | 0.006 | -0.083 | 0.00 | -0.075 | 0.008 | -0.084 | 0.013 |
| Number of adults in the household Childcare: | -0.020 | 2.534 | -0.059^{***} | 2.366 | -0.026^{***} | 2.659 | -0.035^{***} | 2.576 |
| No children in household, woman age ≤ 39 | 0.116^{***} | 0.087 | 0.142^{***} | 0.219 | 0.000 | 0.040 | -0.006 | 0.042 |
| Youngest coresident child aged 0 to 5 | -0.037 | 0.465 | -0.163 | 0.286 | -0.032^{***} | 0.346 | -0.060^{***} | 0.208 |
| Base case: youngest coresident child aged 6 to 12 | | | 0.040 | 0.070 | | | | |
| Youngest coresident child aged 13 to 15 | 0.025 | 0.080 | | | -0.002 | 0.107 | 0.004 | 0.131 |
| Youngest coresident child aged 16 to 17 | 0.054^{*} | 0.033 | 0.095^{***} | 0.035 | -0.001 | 0.058 | -0.003 | 0.065 |
| No children in household, woman age ≥ 40 | 0.026 | 0.053 | 0.037 | 0.109 | -0.021^{***} | 0.093 | -0.047^{***} | 0.206 |
| Education Level: | | | | | | | | |
| Illiterate | -0.092^{***} | 0.191 | -0.063^{***} | 0.078 | -0.091^{***} | 0.117 | -0.012 | 0.032 |
| Primary | 0.009 | 0.348 | -0.036^{***} | 0.340 | -0.055^{***} | 0.282 | 0.011^{***} | 0.205 |
| Base case: junior middle | | | | | | | | |
| Senior middle ^a | 0.029^{*} | 0.113 | 0.061^{***} | 0.086 | 0.063^{***} | 0.228 | 0.087^{***} | 0.251 |
| Post secondary | | | | | 0.091^{***} | 0.036 | 0.203^{***} | 0.085 |

Table 3Marginal Effects of the Determinants of Labor Force Participation in China Urban, Married, Rural-Migrant and NonmigrantWomen, Aged 25–50 in 1990 & 2000 Two-stage Residual Inclusion Model

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| 8 0.221 8 0.222 0.184 0.207 | (0.108) (1.147) (0.147) (0.265) (1.144) (0.144) | 0.597 (**** 0.013 (**** 0.013 | **** 4.631 ** 1.233 2*** 10.402 |)**** 4456.3)**** 9.092 | (continued) |
|---|--|--|--|---|-------------|
| $\begin{array}{c} 0.008\\ 0.008\\ -0.009\\ -0.1111\end{array}$ | $\begin{array}{c} -0.003\\ 0.024\\ 0.000\\ 0.048\end{array}$ | -0.001 | $\begin{array}{c} -0.011\\ -0.009\\ 0.002\\ 0.004\end{array}$ | 0.000 | |
| $\begin{array}{c} 0.230\\ 0.229\\ 0.159\\ 0.142\end{array}$ | $\begin{array}{c} 0.038\\ 0.241\\ 0.245\\ 0.088\end{array}$ | 0.414 0.014 1.380 | 1.246 1.119 16.157 29.193 | 902.7 5.948 | |
| $\begin{array}{c} 0.008^{***}\\ 0.014^{***}\\ 0.001\\ -0.074^{***}\end{array}$ | $\begin{array}{c} -0.039^{***} \\ -0.019^{***} \\ 0.017^{***} \\ 0.044^{***} \end{array}$ | $\begin{array}{c} 0.039^{***} \\ - 0.037^{***} \\ 0.000 \end{array}$ | -0.019^{***} 0.116^{***} 0.002^{***} 0.012^{***} | 0.000^{***} $- 0.007^{***}$ | |
| 0.291 0.188 0.095 0.102 | 0.242 0.193 | 0.698 0.009 0.014 | 4.830 1.217 9.888 69.725 | 5289.3 9.068 | |
| $\begin{array}{c} 0.012 \\ - 0.045 \\ - 0.081^{*} \\ - 0.146^{***} \end{array}$ | -0.004 -0.052^{***} | 0.023^{*} - 0.010 - 0.004 | $\begin{array}{c} -0.009^{***} \\ -0.031^{**} \\ 0.002 \\ 0.019^{***} \end{array}$ | 0.000^{***} 0.012^{**} | |
| $\begin{array}{c} 0.219\\ 0.206\\ 0.130\\ 0.071 \end{array}$ | 0.368 0.179 | 0.676 0.007 1.704 | $\begin{array}{c} 1.783 \\ 1.118 \\ 15.254 \\ 30.043 \end{array}$ | 960.4 6.274 | |
| $\begin{array}{c} 0.075^{***}\\ 0.089^{***}\\ 0.077^{**}\\ -0.023\end{array}$ | -0.022^{**} 0.021 | -0.024^{**} -0.054 0.003^{***} | $\begin{array}{c} -0.053^{***}\\ 0.086^{**}\\ 0.000\\ 0.000\\ 0.056^{***}\end{array}$ | -0.001^{***} -0.011^{***} | |
| Age 30-34 Age 35-39 Age 40-44 Age 45-50 | Spouse s Education: Spouse illiterate Spouse primaiy ^b Base case: spouse junior middle Spouse senior middle ^a Spouse post secondary | City/Town Location: Resides in a city Muslim Effect: Belongs to Muslim ethnic group (0–1) Percent of Muslims in prefectural population | Duer Freuecture variabues: Prefectural unemployment rate Prefectural infant sex ratio Prefectural sex difference in illiteracy rate Provincial Income Variables: Provincial urban real per capita income (100 | yuan) Provincial urban real per capita income squared Provincial annual real GDP growth rate over previous 5 years | |

| | | Rural N | Aigrants | | | Nonmi | igrants | |
|---|--|----------------------------|---|---------------------------------|---|----------------|---|---------------------------|
| | 199(| (| 200 | 0 | 199(| (| 2000 | (|
| Explanatory Variables | dF/dx | x-bar | dF/dx | x-bar | dF/dx | x-bar | dF/dx | x-bar |
| Residuals: Coresident with parents/parents in-law residuals Coresident with person aged 75 or above | -0.220^{***} 0.186 | 0.007 0.000 | -0.252^{***} -0.221 | 0.005 0.001 | -0.068^{***} -0.055^{***} | 0.006 0.000 | -0.087^{***} -0.165^{***} | 0.005 |
| Youngest coresident child aged 0 to 5 residuals | -0.057 | 0.001 | 0.093 | 0.000 | -0.003 | 0.000 | 0.019 | 0.000 |
| Observed P Predicted P Number of obs LR chi2 Prob > chi2 Pseudo R2 Log likelihood Data Sources: 1% Micro Sample of the 1990 Population Cens *** significant at 1%; ** significant at 1% is significant at 1 | 0.504 0.503 12,396 1,119 0.000 0.065 - 8,032 sus of China and | d the 0.095 mts, educat | 0.624 0.632 8,500 629 0.000 0.056 -5,313 % Micro Samp ional attainmen | le of the 200 tt of senior n | 0.870 0.907 213,913 24,325 0.000 0.147 -70,546 0 Population C middle school a | Census of C | 0.773 0.797 62,712 5,492 0.000 0.082 - 30,835 - 30,835 hina Significant | ce Levels: educational |

 Table 3 (continued)

differentials are consistent with the hypothesis that many married migrants with coresident children have withdrawn from the labor force in order to provide childcare for preschool and young school-aged children.

Further evidence of married migrants' withdrawal from the labor force for childcare reasons can be seen in the higher rate of labor force participation of the group of migrant women who are younger than 40 and have no child present. Because many married migrants left their children with relatives in their rural homes, the married women younger than 40 with no children present represent a much larger share of the migrant sample than the nonmigrant case; 22 percent of the migrant women were in this category in 2000 compared to 4 percent of the nonmigrant women. By 2000, these younger migrant women with no children present were 14 percentage points more likely to be in the labor force than migrant women with school-aged children present. In comparison, being younger than 40 with no children present had no significant effect on the labor force participation of nonmigrants compared to nonmigrants with school-aged children present. This difference in the determinants of labor force participation between the migrant and nonmigrant groups is especially important since a sizable portion of the migrant population was in this high labor force participation category. Finally, rural-to-urban migrant women older than aged 40 with no coresident children did not reduce their labor force participation in comparison to those with young school-aged children, while the nonmigrant women of this category had a rate of labor force participation that was 4.7 percentage points lower than that of women with young school-aged children.

We know from Figure 6 above that many migrant women leave their children in the rural areas (also see Connelly, Roberts, and Zheng 2008). However, for the 67 percent of rural to urban migrants who brought their children with them in 2000, it seems that many more of the rural migrant mothers "stayed home" to provide childcare and general household support for their working husbands and their children.³⁸ One of the reasons that migrant women keep their children with them in urban areas may be a desire to improve their children's educational opportunities. A stay-athome mother may facilitate her children's schooling as well as her husband's employment. The opportunity cost of staying at home for migrants is not as high as it would be for urban nonmigrants because migrant wages are much lower than those of nonmigrants (Maurer Fazio and Dinh 2004, Frijters, Lee, and Meng 2010). In addition, as discussed above, migrants in the city often lack the support of the extended families that facilitate employment for women with children.

Lower opportunity cost for rural-to-urban migrant women also may explain why the negative effect of low education levels was significantly larger in magnitude in 2000 for rural-to-urban migrants than for nonmigrants. In 2000, illiterate migrant women had a 6.3 percentage point lower labor force participation rate than those who graduated from junior middle school, while for nonmigrants there was no significant difference between illiterate women and those who graduated from junior middle school. Migrant women with only primary school education also had a significantly lower labor force participation rate in 2000 than those with junior middle school education and they make up 34 percent of the sample. Among nonmigrants,

^{38.} Jacka (2006) focuses in part on this group of women in her ethnography of migrant women in Beijing.

those with only primary school education had a slightly higher rate (1.1 percentage point) of labor force participation than those with middle school education.³⁹ While the lower opportunity cost of "keeping house" for migrant women with low educations is one explanation, it also may be the case that members of this group face more trouble in finding a job and were more likely to become discouraged workers.

The differential in labor force participation rates between older and younger women within the prime-aged group is statistically similar for rural-to-urban migrants and urban nonmigrants. Rural migrants aged 45–50 were 14.6 percentage points less likely to be in the labor market than 25–29-year-old migrants in 2000, while the effect for nonmigrants was 11.3 percentage points. However, the decline in labor force participation begins sooner for migrants. Those aged 40–44 had a significant 8.1 percentage point decline in labor force participation compared to 25–29-year-olds, while there was no significant effect of being 40–44 for urban residents in comparison to 25–29-year-olds. Given the younger age of marriage and first birth of rural women compared to urban women, the rural women age 40 and older are much more likely to be grandmothers than their nonmigrant urban counterparts. Thus, the older migrants who are not in the labor force participation of their daughters-in-law.

IV. Conclusions

In this paper, we examined evidence of prime-aged, urban, married women's labor force participation decisions at three points of time between 1982 and 2000, a time period that coincided with the period of rapid structural change in the urban Chinese labor market. Overall, we found strong evidence of increasing discretion in prime-aged women's labor force participation. Coresidency with older relatives did not reduce prime-aged married women's participation in market work as has been shown in Western economies, but rather, in urban China, coresidency with parents or parents-in-law and with elders increased married women's labor force participation. The employment-facilitating effect of coresidency with parents or parents-in-law was even larger after explicitly modeling the potential endogeneity of coresidence than when treating coresidence as exogenous, and was statistically larger for rural-to-urban migrants than nonmigrants.

Care needs to be exercised when modeling intra-family exchange. In a Western context, the direction of care is usually modeled from adult children to elderly parents. It may be the case (even in the Western context) that a significant amount of care is moving in the other direction, that is, from parents to their adult children. In the Chinese case, we found that care moved in both directions. Prime-aged women appeared to provide care for disabled family members, but coresidency with parents or parents-in-law and even with elders increased the probability of women's labor force participation. Part of increase in labor force participation in 2000 may be the

^{39.} All of these effects are statistically different between migrants and nonmigrants based on a standard t-test of the difference in coefficients at the 5 percent level.

result of the much higher out-of-pocket medical costs and higher income needs that most Chinese families faced at the end of the 20th century. China is promising a new overall health insurance regime soon, and those changes may reduce the labor force participation of married older (prime-aged) women. In addition, a policy such as portability of rural health insurance that would grant older rural residents better access to healthcare in urban areas would allow more parents-in-law and parents to accompany adult children to urban areas and provide needed support for younger women's employment.

Migrant women's participation in market work also seemed to be hampered by childcare concerns to a much greater extent than that of urban nonmigrants. In 2000, migrant women with preschool-aged children were 16.3 percentage points less likely to participate in market work than migrant women with young school-aged children and 30.4 percentage points less likely than married migrant women with no coresident children (Table 3, Column 3). In contrast, urban women with young children were 6.0 percentage points less likely to be in the labor force compared with those women with young school-aged children and 6.6 percentage points less likely to be in the labor force than their childless counterparts. (Table 3, Column 4) A common migrant solution to the problem of childcare is to leave their children in the care of relatives in the rural areas while they work in urban areas. One third of our sample of married, rural-to-urban migrants had children (younger than 18) who were not residing with them. Migrant parents and children are often separated from each other for long periods of time. Our analysis shows that another solution to the childcare problem that rural-to-urban migrant women faced was to withdraw from the urban labor market. A policy that would subsidize nonparental childcare for migrant families in urban areas might provide strong welfare gains in comparison to either of the above mentioned options.

Our results provide evidence that some urban nonmigrant mothers of young children were withdrawing from the labor force even in 1990. A comparison of the three census years for the nonmigrants (Tables 2) shows that in 1982, the presence of young children had a small positive effect on women's labor force participation, but that in 1990 and in 2000, the effect of very young children on urban women's labor force participation was negative. Thus, as we expected, the negative effect of young children has increased, given both increased levels of income and the greater degree of personal choice available to urban women in 2000 as compared to 1982.

Another large change from 1982 to 2000 was the much expanded differential in labor force participation by education—especially at the top of the education distribution. In 1982, women with post secondary education were 5.5 percentage points more likely to be in the labor force than those with middle school education, while in 1990 the differential was 9.1 and in 2000 the differential was 20.3 percentage points (Table 2).

We also observed statistically significant changes between 1982 and 1990 in the differential in labor force participation by age, especially an increasing decline of labor force participation of women in the oldest age category (within our group of prime-aged women). We had expected to see a decline in the labor force participation at the oldest age category in the most recent census due to differential layoffs and the discouraged-worker effect but the difference between 1990 and 2000 was not statistically significant.

We plan, in future work, to compare the labor force participation of rural women living in rural areas with urban women. It will be especially interesting to compare the rural women living in rural areas to the rural-to-urban migrants enumerated in urban areas. We also plan to look at the labor force participation of older women, that is, those beyond 50 and younger women (16 to 24 years of age) and compare their labor force participation patterns to the prime-aged women featured here. In those comparisons, we expect changes in years of school attendance to figure importantly for the younger women and demographic changes (such as age at first birth and age at marriage) along with changes in economic conditions and labor market institutions to figure importantly at older ages.

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