

Fertility of Chinese International Migrants and Non-Migrants During China's One Child Policy Period

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Abstract

The purpose of this paper is to assess the effects of Chinese fertility policies and to analyse the fertility of international migrants in the US. The comparison of non-migrants with migrants allows us to assess the emancipation effect from fertility policies, since migrants are no longer subject to them. Meanwhile, the fertility of migrants is the result of the migration process and the situation in the new destination. We use data from the US censuses of 1980, 1990 and 2000, and the Chinese censuses of 1982, 1990 and 2000 from IPUMS, and use event history models to analyse fertility probabilities by birth parity. Our results show that living in the US predicts higher probability of having a second and third birth, but not the first birth. This means that migrants do take advantage of the emancipation effect to achieve higher order birth, i.e., second and third birth, which is somehow or fully restricted by fertility policy. Migrants faced great disruption on the first birth but not the second and third birth. Migrants could not recover from the disruption effect of migration on the first birth even after three years living in the US.

1 Background

This paper compares the fertility level and determinants of Chinese international migrants and non-migrant women during a period of radical policy changes in mainland China, i.e., from the mid 1960s to 2015. We study the fertility of migrants to US, the most popular oversea destination for Chinese and where birth right citizenship is applied. Taking Chinese non-migrants

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as reference group, we attribute the different fertility tempo and quantity of migrants to three effects: the emancipation effect away from China’s population policy, the disruption caused by migration and the adaptation effect of international migration on fertility.

The core interest of this paper is to measure if these three effects exist or not, and if so, how do they interact to shape the fertility of Chinese international migrants. We further checked if during the past 36 years, i.e., 1979-2015, one child policy has ”effectively” controlled the higher order births or not. For instance, the decreased fertility level on third birth during that period means the effectiveness of one child policy and its subsequent slackening that allowed for at most two children for specific group of population. Similarly, the decreased fertility level on the second birth indicates the success of policies that allowed for only one child. By contrast, international migrants are no longer subject to these policies once they migrate, which could potentially lead to an increase in their fertility levels and to an earlier fertility timing. The migration process itself and the new conditions in the destination, however, should also affect their fertility.

2 Theoretical Frameworks

2.1 Power of One child policy

One important interest of this paper is to calibrate the implementation of one child policy for Chinese natives during the first 20 years of one child policy era, from 1980 to 2000. Several relaxations of one child policy were launched during the 1980s and 1990s, the timing of implementation of these relaxations varied across province of living, and *hukou* status (individual’s agricultural or non-agricultural administrative registration), see Table 1 for details. We checked the fertility level for three birth transitions when only 1 child is allowed, only 2 children are allowed and when no birth restrictions apply (including if the woman has migrated, another way of freeing away from one child policy).

For couples living in Mainland China during one child policy period, the only channel for the couple to have more births than allowed is through contributing to a “social support” fee as a form of punishment, which is usually equal to or being multiple of household total income of last year. The social support fee should be paid once at the birth of the above-quota child. Take Guangdong Province as an example, the social support fee is three to six times the average annual income, and the number of above-quota children times the social support fee of the first above-quota child for the second above-quota child and more.

The payment of social support fee, though there is lack of official statistics, is assumed to be prevalent among the number of above-quota births, since it is directly related to whether the above-quota child is granted a *hukou* or not. *Hukou* refers to official household registration, which determines the access to most social benefits, thus is very important for all citizens. The

success to the extent that one child policy achieved depends on couple's affordability to pay the social support fee, or to shrink number of children to the allowed level, if they wanted more than the allowed number of children.

On the micro level, the power of one child policy reflects the relative importance of achieving the desired number (likely to be more than 1) of children and saving last year's household total income. It's a power relative to preference of higher fertility level. On the macro level, Feeny and Wang (1993) presented the limited power of one child policy by checking the progression parity ratio, arguing that even after 1980s, less than 25% of the families had only 1 child, and that nearly half of the women having 2 children continued to have a third one, though the policy contributed vastly to the decline of progressing to a second child.

There was a debate between attributing the sharp fall of total fertility rate to intense government intervention, i.e., one child policy, and to rapid socio-economic development. The latter argues that even without one child policy, China's TFR should have fallen to a low level. By comparing the fertility level for two provinces in China, ZheJiang and JiangSu, Cai (2010) concluded that policy is not the key role, instead, socio-economic development is the decisive power of low fertility level in China. While Gu and associates (2007) found that the actual fertility level has converged to the government-desired one, with 70% percent of population living in places with local TFR between 1.3 to 2.0, and one-third of population living in places where one child policy was applied, implying a well converged policy target and reality.

China has 23 provinces, 4 municipalities, 5 autonomous regions and 2 special administrative regions. Here we employ data on 22 provinces (except Taiwan), 3 municipalities (except Chongqing which was included in Sichuan Province) and all the 5 autonomous regions that in total cover all the regions in Mainland China. We combine the provincial difference with *hukou* status, and compare non-migrants with international migrants whose fertility behaviour is beyond control of government intervention, to calibrate the power of one child policy by birth parity. A List of these provinces, municipalities and autonomous region could be found in Figure 1.

H1: If one child policy is effective, the probability of having a second child should be lower for those who are only allowed to have at most 1 child, and the probability of having a third child should be lower for those who are only allowed to have at most 2 children comparing with others without any restrictions or living in the US.

2.2 Emancipation hypothesis

Emancipation hypothesis assumes that a higher fertility level than the one child policy is naturally preferred. In Chinese traditional culture, a higher fertility is explicitly preferred saying "more sons more happiness (*"Duo Zi Duo Fu"*)", because sons are responsible for caring the par-

ents at their old age, and because the more sons they have, the more likely that the patriarchal line in form of inheriting the surname would survive and flourish (Bongaarts and Greenhalgh, 1995). The responsibility of expanding family tree through having more sons is the main body of filial duty they shouldered from their ancestors. With implementation of one child policy, nearly 50 percent of the patriarchal lines would be broken, and the probability that there would a son shrinks to a half, which is part of the reasons why the policy faced resists from the people (Bongaarts and Greenhalgh, 1995). Given the high fertility preference ingrained in Chinese traditional culture, the hypothetical fertility level without one child policy should be higher than the reality under birth control.

To check if there is an emancipation effect of migration on fertility, existing literature has explored rural-to-urban temporary and permanent migrants within China yielding mixed conclusions. Yang (2000) found that rural-to-urban temporary migrants, who registered as rural dwellers but lived in urban area, are actually escapees from one child policy and presented a higher fertility level than permanent rural-to-urban migrants and non-migrants. While Liang et al (2013) found rural-to-urban migrants decreased fertility while urban-to-rural migrants increased fertility, the extent to which fertility level decreased was greater than that of increased based on empirical work on Hubei Province, China.

On the contrary, the fertility level of Chinese international migrants is barely mentioned in previous literature. An exception is Hwang and Saenz (1997) who argue that female Chinese migrants to the US from Mainland China have achieved a higher fertility level than those migrated from other East Asian countries and regions without fertility restriction. This is attributable to emancipation effect, meaning that fertility should bounce back once restriction is released, i.e., after migrating to the US. However, Coleman and Dubuc (2010) found the fertility level of Chinese international migrants the lowest among all ethnic migrant groups and much lower than White British from 1996 to 2005, which was, TFR 1.23 and 1.24 for Chinese migrants 1996-2000 and 2001-2005, and TFR 1.72 and 1.71 for White British 1996-2000 and 2001-2005, respectively. Another work on Australian context found similar lower fertility level for Chinese international migrants (Abbasi-Shavazi and McDonald 2000). But it is still not clear which fertility level is lower, the one of Chinese international migrants or of non-migrants.

No matter how harsh one child policy was, the first child was never restricted, except that later-longer-fewer policy (started 1974) leads to a delayed marriage, which might affect the timing of the first birth. The second birth was sometimes allowed if living in certain provinces, with agricultural *hukou* or other conditions, and the third birth was almost never permitted after 1980 with few exceptions, eg. herders in Tibet could give birth to at most three. The emancipation hypothesis, if true, should be found more for the high birth order, i.e., third birth, and less so the second, least so the first, which should only be little.

H2: If emancipation hypothesis holds, migrants should have a higher fertility level than Chinese natives on the third birth transition, less so on the second birth transition, and least so on the first birth transition.

Chinese women experienced the first release of one child policy at different ages in 1980. Women of older cohorts entered into one child policy period at older ages who might already had more than 1 child, so their higher order births are less likely to be controlled by the one child policy. While non-migrants of younger cohort are affected at earlier ages and spent more years during reproductive ages under one child policy, so their probability of having higher order births are more affected by one child policy than non-migrants of older cohort.

H3: According to emancipation hypothesis, migrants of younger birth cohorts have higher fertility compared to non-migrants of the same cohort. Non-migrants of younger cohort spent earlier and longer years of reproductive ages under one child policy, whose fertility behaviour is more depressed by the one child policy.

2.3 Migration as a Disruption to the fertility process

The disruption hypothesis argues that moving itself is a stressful process for migrants, which depress fertility shortly after migration, especially for international migrants (Milewski 2010). Difficulties of giving birth around migration may involve separation of spouses, uncertainty about the future, and pragmatic concern such that childbearing might impede economic success, or a temporary lack of resource. Migration disruptive effect leads to postponed birth and accelerated fertility behaviour after the uncertainty brought by migration disappeared (Goldstein et al 1997).

Greenhalgh (1988) argues that in a culture of economic rationality, fertility of the Chinese is adjusted to achieve mobility and security. People would calculate the benefits and costs of giving birth. Their fertility depends on sensitivity to costs and benefits and mobility orientation. This could be also true for Chinese international migrants around migration time, who are more economically oriented, and would like to achieve other goals than fertility during the most difficult time due to lack of economic resources.

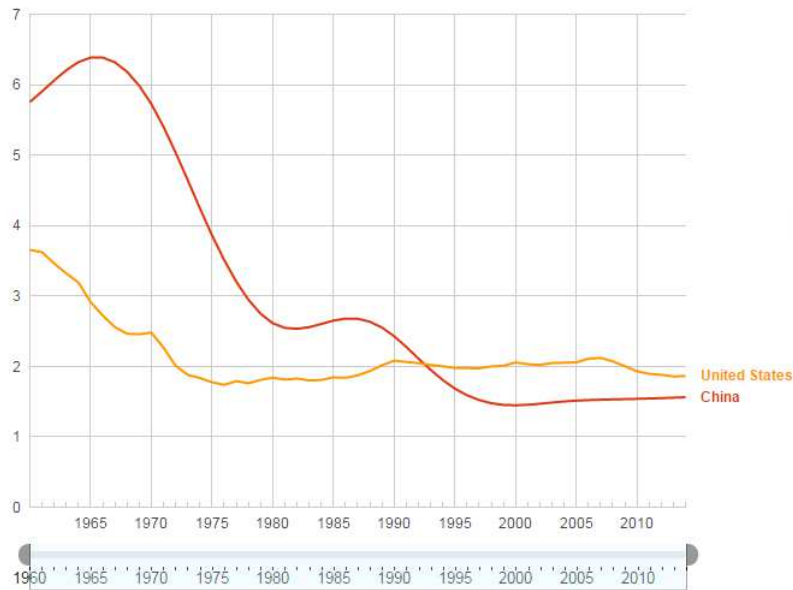
H4: If the migration disruption hypothesis holds, migrant's fertility level should decrease around migration time, and recovers afterwards.

2.4 Migration Adaptation Hypothesis

Unlike disruption theory, adaptation hypothesis focus on the medium-term effect of migration on fertility. A fertility converge with locals would be achieved by migrants within some years of residence through adapting to cultural norms in destination and improved socio-economic

conditions (Milewski 2010). This hypothesis has not yet been tested for Chinese migrants in the US context, in spite of clear relevance. If this theory holds, we would see different converging patterns before and after 1990s, since the period TFR lines of the two countries intersected during those years, as shown below. The differential converging pattern before and after 1990 will be tested after complete data of China census 2000 is available. For the present version of the paper, we don't differentiate the adaptation pattern before and after 1990s.

Figure 1: Source - World Bank. Total fertility rate, China and US, 1960-2010



H5: If fertility adaptation hypothesis holds, on the census year of 1980 and 1990, fertility level of migrants decreased as duration of stay in the US increased. But on the census year of 2000, fertility level of migrants should increase as duration of stay increase, since migrants catch up on giving birth after recovering from the difficult time of migration.

3 A brief review on China's one-child policy

China's one child policy was introduced during the second half year of 1979 and had been implemented for 36 years until the beginning of 2016, followed by several relaxations that worked for rural residents, minority ethnic groups, and economically disadvantaged families. From 1950 to 1970, the family planning policy suggested a switch from implicit birth control to at most two children. From 1959 to 1962, the country experienced a "three-year difficult time", a period of prevalent famine where little fertility policy was enacted, after which, TFR increased from 6 to around 6.5 as compensation reaction. It started to drop right after 1965 baby boom as a result of "instruction on formal implementation of birth control" enacted in the end of 1962, and since then dropped sharply to around 2.5 within only 15 years in 1980, when one child policy was enacted.

During 1970s, “later-longer-fewer (*wan-xi-shao*)” was introduced. It refers to postponed marriage, meaning ages at marriage 28 and 25 for males and females with non-agricultural residence, 25 and 23 for males and females with agricultural residence, four years interval between two births, at most 3 children for rural dweller and at most 2 children for urbanites (Bongaarts and Greenhalgh, 1985). In 1979, “one child certificate” was introduced to guarantee a series of benefits for those who got one child and promised not to have a second one. According to Cooney and Li (1994), urbanization interacted with household registration is the most important predictor of lower fertility. Chinese who rely mostly on agricultural production (i.e., rural dwellers) are allowed to have more children than others who are assigned salary and pension (i.e., urbanites). Hastened urbanization included more people under stricter birth control and contributed to lower fertility level.

After the 1959-1961 “three years difficult time” (great famine), the government started to restrict rural dwellers migrating to urban area and initiated birth control for urbanites inspired by neo-Malthusian argument of negative correlation between oversize population and potential of economy (Peng 1991, Cai 2010). In the second half year of 1979, the government launched one child policy, which encouraged couples of Han ethnicity, the majority ethnic group, to have only 1 child. The total fertility rate even increased slightly after the release of one child policy to approach 3, but dropped again to below replacement level in the 1990s even with relaxation policies.

From 1984 on, there were several relaxations of one child policy by *hukou* registration status that couples both being the only child in their origin family, or that couple either being the only child, or the first child being female could continue to give birth to a second child. The above mentioned conditions are known as “both being only child have 2 births (“Shuang Dú Liang Hái”), either being only child have 2 births (“Dan Dú Liang Hái”), and “one-and-a-half child (“Yì Hái Bàn”) policy, respectively. The one-and-a-half child policy was later argued to have brought sex ratio up.

In Table 1, we list the conditions of provinces, periods and *hukou* status (agricultural, non-agricultural) under which only 1 child is allowed and two children are allowed, respectively. The conditions under which only two children are allowed include couple both being the only child, either being the only child and with agricultural residence, and first child being female. The years between 1956 and 1973 are period without explicit or strong birth control. The later-longer-fewer period was roughly between 1974 and 1979. And the period after the enact of one child policy in 1980 and before actual relaxations were made was when “only 1 child was allowed”.

From 1990 to 2010, one child policy was reinforced by linking individual’s conformity of which to evaluation and administrative nomination in the work place. During this period, China total

Table 1: Provinces and significant time in points of birth control policies

Province Name	Only 1 child allowed	Couple both being the only child give birth to 2	Couple either being the only child give birth to 2	Couple with agricultural HuKou first child being girl give birth to 2
AnHui	1980-1984, both	After 1985, both	After 1985, agricultural After 2014, non-agri	After 1989
BeiJing	1980-1983, both	After 1983, agricultural After 1984, non-agri	1984-1991, agricultural After 2014, non-agri	Not Applicable
FuJian	1980-1983, both	After 1984, both	After 2002, agricultural	After 2002
HeBei	1980-1981, agricultural 1980-1983, non-agri	After 1982, agricultural After 1984, non-agri	After 2014, both	After 1994
HeiLongJiang	1980-1982, agricultural 1980-1983, non-agri	After 1983, agricultural After 1984, non-agri	1984-1990, agricultural After 2014, non-agri	Not Applicable
Inner Mongolia	1980-1988, agricultural 1980-2001, non-agri	After 1989, agricultural After 2002, non-agri	After 2014, both	After 1989
JiangSu	1980-1983, both	After 1984, both	After 1991, agricultural After 2014, non-agri	Not Applicable
JiangXi	1980-1982, agricultural 1980-1986, non-agri	After 1983, agricultural After 1987, non-agri	After 2014, both	Afer 1986
JiLin	1980-1983, both	After 1984, both	After 2003, agricultural After 2014, non-agri	After 1994
LiaoNing	1980-1983, both	After 1984, both	After 1984, agricultural After 2014, non-agri	After 1988
ShanDong	1980-1981, agricultural 1980-1983, non-agri	After 1982, agricultural After 1984, non-agri	After 2014, both	After 1986
ShangHai	1980-1983, both	After 1984, both	After 1990, agricultural After 2014, non-agri	Not Applicable
Shanxi	1980-1981, agricultural 1980-1986, non-agri	After 1982, agricultural After 1987, non-agri	1987-1999, agricultural After 2014, non-agri	Not Applicable
TianJin	1980-1982, agricultural 1980-1983, agricultural	After 1983, agricultural After 1984, non-agri	After 1983, agricultural After 2014, non-agri	Not Applicable
ZheJiang	1980-1983, agricultural 1980-1984, non-agri	After 1984, agricultural After 1985, non-agri	After 2014, both	After 2002

Notes: (1) Province Name. AnHui, Fujian, HeBei, HeiLongJiang, JiangSu, JiangXi, JiLin, LiaoNing, ShanDong, ShanXi, Zhejiang, Gansu, Guangdong, Guizhou, Hainan, Henan, Hubei, Hunan, Qinghai, Shaanxi, Sichuan and Yunnan are provinces. BeiJing, ShangHai and TianJin are municipalities. Inner Mongolia, Guangxi, Tibet, Ningxia, and Xinjiang are autonomous regions. These provinces, municipalities and autonomous region have different relaxations across time.

(2) No restrictions means without any birth control, mainly the period before one child policy except the 3-year difficult time.

(3) Only 1 child allowed refers to the strictest condition that no more than 1 child is allowed. Policies Differ mainly by period and *hukou* status, agricultural or non-agricultural residence.

Province Name	Only 1 child allowed	Couple both being the only child give birth to 2	Couple either being the only child give birth to 2	Couple with agricultural HuKou first child being girl give birth to 2
GanSu	1980-1983, agricultural 1980-2001, non-agri	1984-1989, agricultural After 2002, non-agri	After 2014, both	After 1990
GuangDong	1980-1983, both	After 1984, both	1986-1998, agricultural After 2014, non-agri	After 1986
GuangXi	1980-1984, both	After 1985, both	After 2014, both	After 1989
GuiZhou	1980-1983, both	After 1984, both	After 2014, both	After 1998
HaiNan	1980-1983, both	After 1984, both	After 1986, both After 2014, non-agri	1986-1989
HeNan	1980-1983, agricultural 1980-2011, non-agri	1984-1990, agricultural After 2012, non-agri	After 2014, both	After 2012
HuBei	1980-1983, agricultural 1980-2011, non-agri	1984-1990, agricultural After 2012, non-agri	After 2014, both	After 1988
HuNan	1980-1984, agricultural 1980-1984, non-agri	After 1985, both	After 2014, both	Afer 1987
NingXia	1980-1986, non-agri	Always, agricultural After 1987, non-agri	Always, agricultural After 2014, both	Always
QingHai	1980-1985, non-agri	Always, agricultural After 1986, non-agri	Always, agricultural After 2014, non-agri	Always
ShaanXi	1980-1985, both	After 1986, both	After 2014, both	After 2002
SiChuan	1980-1983, both	After 1984, both	After 2014, both	Not Applicable
Tibet	1980-1991, non-agri	Always, agricultural After 1992, non-agri	Always, agricultural After 2014, non-agri	Always
XinJiang	1980-1991, non-agri	Always, agricultural After 1992, non-agri	Always, agricultural After 2014, non-agri	Always
YunNan	1980-1990, non-agri	Always, agricultural After 1991, non-agri	Always, agricultural After 2014, non-agri	Always

Notes: (3) Couple both being the only child give birth to 2 means that if both husband and wife are the only child in their origin family, then they are allowed to have at most 2 children. Policies differ by province, period and *hukou* status.

(4) Couple either being the only child give birth to 2 means that if either one of the couple is the only child in the origin family, then they are allowed to have at most 2 children. This is a further relaxation of (3). Policies Differ mainly by province, period and *hukou* status.

(5) Couple with agricultural *hukou* firs child being girl give birth to 2 means that if the couple is of agricultural residence, and that their first birth is a female, then they are allowed to have a second birth. Not applicable means that this policy has never been executed in that region at any period. Policies differ by province and period.

(6) Both refers to both agricultural residence and agricultural residence. Non-agri refers to agricultural residence.

fertility dropped rapidly that represented the lowest level worldwide. In the autumn of 2013, a turning point came as one of the couple either being the only child of origin family could have two children regardless of *hukou* status or the sex of first child. However, in 2015, the official register of second birth intention showed that, among the 11 million eligible families, only 0.7 million of them applied for the quota of a second child, roughly 6%, much lower than official expectation (18%).

Maybe demographers should not be too disappointed by the low self-reported second birth intention in 2015, since it was a year of sheep, an unfavourable zodiac for the Chinese, and that the intention for a second birth had great regional variance. For instance, Canton city reported that 28% of the eligible families are ready to have a second birth, four times the national average, due to cultural preference. For whatever reason, on 29th October 2015, the government decided that all couples could have at most two children, and that all second child born after 1 January 2016 are births that meet the fertility policy, signifying the end of one child policy since 1979.

4 History of Chinese international migration to the US

The earliest scaled Chinese migration to the US could be dated back to the 1850s when Cantonese living in Taishan and Canton city migrated to North California as railway constructors. Ever since 1848 when gold mountain was discovered in California, 335,000 Chinese travelled to the US. The period between 1852 to 1882 was a transition between petty-commodity to capitalism in the US, and the ethnic tensions between the white and the Chinese got more intensive due to economic competition.

The American government passed the 1882 Exclusion Act that banned more Chinese migrants coming as labours (Boswell 1986). Migration flow from Canton to the US stopped when this administration law that unfavoured Chinese was enacted in 1882 (Walker 1977). Nowadays, city San Francisco is still called “the Old Gold Mountain (“Jiù Jin Shan”) in Chinese, reminding us of the time of gold mining.

Chinese Americans, or American Born Chinese (ABC), clustered in metropolis including New York, San Francisco, Los Angeles, etc., and built up China Town as an economic enclave to maintain Chinese living style and cultural characteristics. They are supposed to have a lower fertility level than US natives, but little literature has seriously addressed their actual fertility behaviour.

From 1950s to 1960s, there was a second large migration flow from China to the US. During these two decades, “Immigration and Nationality Act of 1952” and “Immigration and Nationality Act of 1965” were enacted. The former came up with a quota system for country of origin

with a preference for immigrants of certain origin, while the later abandoned the usage of quota assigned to different countries of origin.

After 1977 when People’s Republic of China started to allow out-migration to the US, total number of Chinese migrants in America grew from around 700 thousand in 1970, to 1558 thousand in 1980 and 3226 thousands in 1990, becoming the destination with second fastest growing rate of out-migration after Oceania, estimated by Poston et.al (1994). This vast out-migration flow during 1980s and 1990s is captured in this chapter. Soon after allowing migrants moving to the US in 1977, China initiated the ever strictest fertility policy known as “one child policy” in 1980.

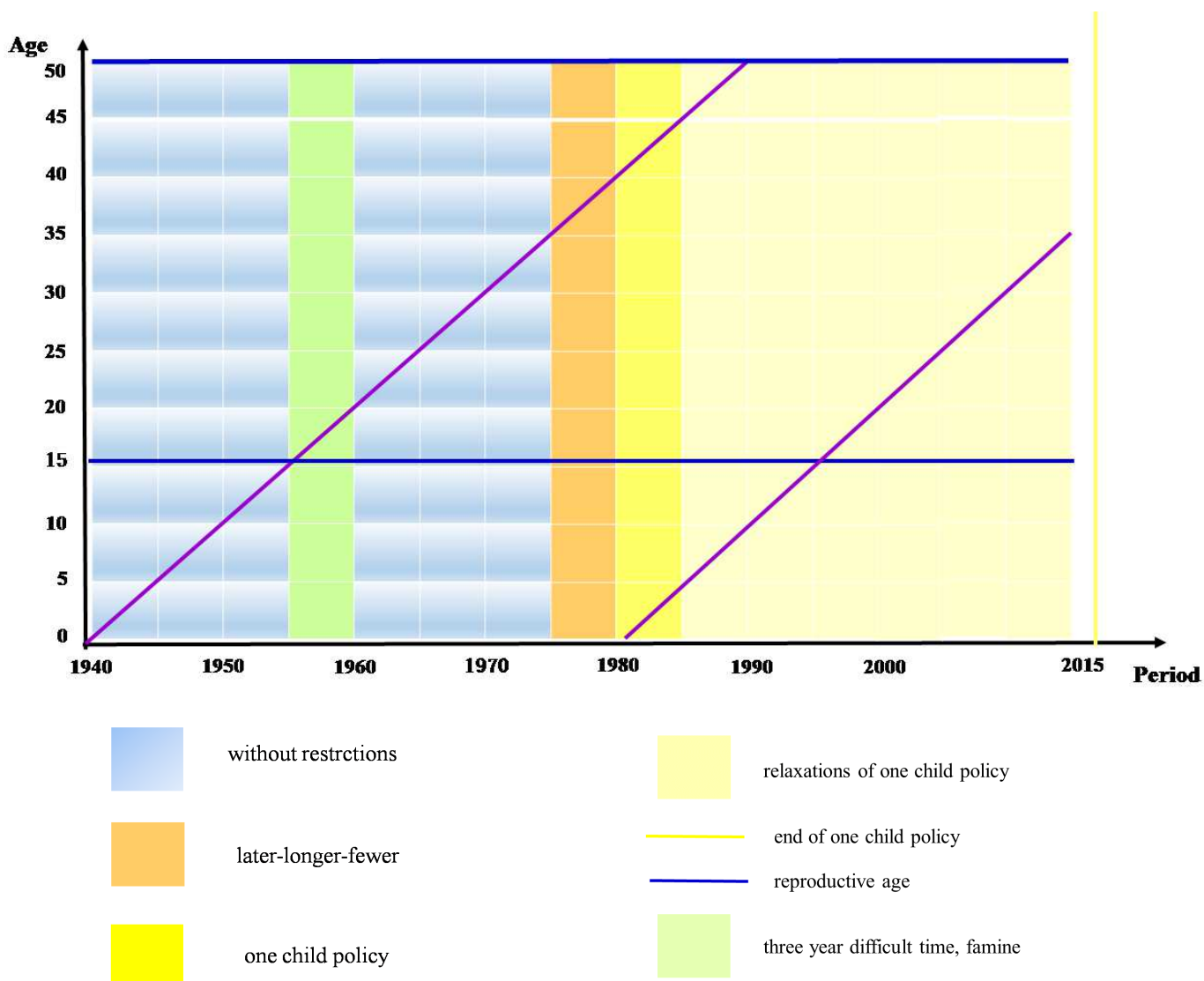
5 Data and Measurement

Data on first-generation Chinese migrants in the US is used for the period when one-child policy is dominated in Mainland China, i.e., from 1980 to 2000. To trace both Chinese migrants and non-migrants in this period, we use the US census 5% sample of 1980, 1990, 2000, and the Chinese census 1% sample of 1982, 1990, 2000 (will be available soon), available thanks to IPUMS-USA and IPUMS-International China sub-sample. For US census data, we identified the females in reproductive ages who were born in China from 1940 to 1980, and that were living in the US at survey year, i.e., first-generation migrants.

As shown in Figure 2, females were born between 1940 and 1980, whose fertility history lie on the 45 degree diagonal (in purple) and encounter different fertility policies across reproductive ages (in blue, 15 to 49). The one-child policy roughly started the year 1980 and ended in the first day of 2016. Year 1958 to 1961 (in green) was during the great famine, which might affect fertility to some extent. The blue grids represent the period without strong birth control. Orange grids represent period of later-longer-fewer policy, yellow grids represent one child policy without relaxations, and light yellow grids stand for when several relaxation of one child policy were expanded across the country. Fertility decision of cohort 1930s to 1990s might be influenced by the one child policy, though they stayed for different length during and beyond one child policy period from 1980 to 2015. It seems that cohort 1950s, 1960s and 1970s are the most affected by one child policy if we assumed that the age at first birth varies between 15 to 30. We focus on the fertility behaviour of Chinese first generation female migrants who were born between 1940 and 1980.

We identify pairs of Chinese international migrants and their counterpart non-migrants that born in the same year and reached the same age at survey year and end up with 1:1 match of migrant and non-migrants. The pair of migrant and non-migrant extracted from US and Chinese census, respectively, share similar cohort and age characteristics but differ in migration

Figure 2: One child policy by age and cohort



experience. The former migrated to the US at least one time in life, while the later never migrated at least until the survey time. One data matching example could be found in Riosmena et.al (2017).

The main variables are one child policy, years since migration and migration status (living in China or the US), controlling for age, cohort and women's educational attainment. One child policy variable is categorised as only 1 child allowed, only 2 children allowed during later-longer-fewer period and, no restrictions. Roughly, listed in a time order of policy release, under the following five conditions, couple could give birth to at most 2 children: both being the only child with agricultural residence, both being the only child regardless of residence type, first child being girl with agricultural residence, either being the only child with agricultural residence, and either being the only child regardless of residence type.

In this paper, we only look into the first, second, fourth of the above-mentioned conditions since we didn't end up with enough observations of the third condition, and that the fifth policy, either being the only child give birth to 2 regardless of residence type was only released after 2014, which is, beyond the observation window of this paper. No restrictions refer to period without any birth control, that is, before 1973 when "later-long-fewer", meaning later marriage, each couple two children and four years interruption between first and second birth, was enacted. However, to wash out effect of famine on fertility, the "three years difficult time", from 1958 to 1962, are excluded from the analysis.

Migration status means if he/she is migrated or not, 0 living in China, 1 living in the US. It refers to person-year inside and outside of China. It is coded 0 for all person-years for Chinese non-migrants since they have never migrated abroad by the survey time, and 1 for the years after migration for Chinese migrants in the US. Return migration is not considered, which might just slightly bias the result as Chinese international migrants have remarkably low return rate.

Years since migration is a categorical variable estimating disruptive effect of migration on fertility. The reference category is non-migrants and more than 3 years since migration. Taking three years before or after migration as the threshold, we have less than three years before migration, less than three years after migration and more than three years after migration. For transition to the second and third birth, duration since last birth is a numeric like age, with a squared term as controls. Cohort is coded with 5-year-interval from 1940 to 1980 for first birth transition models, and to 1970 for second and third birth transition models.

Child gender deals with the sex of first and second child, with male child as reference category. On second birth order, rural citizens with first child being girl could give birth to a second child, known as "one-child-and-a half" policy. The decision of having a third child could

be due to son preference. By including women’s educational attainment into the model, we controlled for educational selectivity of Chinese international migrants, that the different fertility level of migrants and non-migrants is not due to different educational attainment of the two groups.

We separate the likelihood of having birth by birth parity since the higher birth order, i.e., second and third birth are depressed differently by policy. The policies that targeted on the second birth vary across conditions listed in Table 1, but none is allowed to have a third or more birth (except eg., herders in Tibet), while there is no restrictions ever on the first birth.

6 Descriptive Statistics

Table 2 descriptive statistics show the age structure at survey time, parity-specific births by mothers’ age group, number of women at exposure by birth parity, i.e., number of females during reproductive ages, parity progression ratio, i.e., proportion of females continue to give a nth birth if already had (n-1) child(ren), sex ratio of each birth (male/female), women’s year at migration. Only a sub sample of Chinese non-migrants are included, which are matched with migrants by birth year and age at survey. Each non-migrant in the sample could find his/her counterpart who was born in the exact same year and of the same age at the survey year.

Since we only included women born between 1940 to 1980, women aged over 40 above in US 1982 and China 1980 are not included, thus the parity progression ratio and sex ratio is not comparable across census but between migrants and non-migrants. Unfortunately, year married, times married, age at first marriage, duration of current marital status are partly and fully missing for these six populations. But 1980 5% US census gives information on times of marriage and year at first marriage, which provides us with general picture of marriage of Chinese migrants in the US. Based on an unpublished study on marriage timing of Chinese migrants to the US, we found that marriage usually happen before migration, and that overall marriage rate for Chinese international migrants is much lower compared with Chinese internal migrants. The sex ratio of each birth for migrants is always lower than that of non-migrants. Sex ratio here refers to that of survived daughters and sons, not sex ratio at birth.

Table 2: Descriptive Statistics

	Chinese Non-migrants			Chinese Migrants		
	1982	1990	2000	1980	1990	2000
Sample size	1151796	1728923	2054789	4750	11881	15263
Age structure						
15-19	12886	9633	0	17	16	0
20-24	122320	208218	71621	411	327	240

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Table 1 – *Continued from previous page*

25-29	333683	383454	278599	1472	2020	1784
30-34	310881	356681	445999	1623	2585	2568
35-39	240547	381909	418780	1040	2608	2599
40-44	131479	235432	238346	187	2487	1950
45-49	0	132891	164781	0	1514	1831
above 49	0	20705	436663	0	324	4291
Cohort						
1940-1944	220375	121658	175281	998	1473	1591
1945-1949	262738	205380	242398	1464	2238	2201
1950-1954	344547	358017	140471	1677	2703	1897
1955-1959	267404	382889	233537	573	2604	2014
1960-1964	55319	363711	373316	38	2290	2498
1965-1969	1413	272466	818165	0	573	4822
1970-1980	0	24802	71621	0	0	240
No. Births happened						
<i>1st child</i>						
15-19	126954	133054	77668	138	149	79
20-24	623145	979885	935111	874	1417	623
25-29	235443	496697	522869	1221	3126	1301
30-34	13513	42912	49525	359	1502	500
35-39	979	4412	6146	31	257	72
40-44	49	664	892	0	19	9
45-49	0	68	123	0	1	0
<i>2nd child</i>						
15-19	11303	15058	6203	13	19	11
20-24	356306	403495	244751	369	501	179
25-29	363781	551000	390242	790	1710	383
30-34	47992	17268	139101	482	1631	239
35-39	3231	48582	19040	68	534	61
40-44	117	1349	1824	3	44	6
45-49	0	115	220	0	2	0
<i>3rd child</i>						
15-19	408	860	276	0	2	39
20-24	86852	76036	31666	89	98	116
25-29	303141	289942	122039	277	481	91
30-34	95017	163212	68161	188	547	30
35-39	8528	33849	15566	36	238	4
40-44	342	4073	1805	0	31	0
45-49	0	328	236	0	0	0
No. Women at exposure						
<i>1st child</i>						
15-19	1024842	1595869	1977121	4612	11732	15184
20-24	401697	615984	1042010	3738	10315	14561
25-29	166254	119287	519141	2517	7189	13260
30-34	152741	76375	469616	2158	5687	12760
35-39	151762	79071	463470	2127	5430	12688
40-44	151713	71963	462578	2127	5411	12679
45-49	151713	71231	462455	2127	5410	12679
<i>2nd child</i>						
15-19	126954	133054	77668	138	149	79
20-24	738796	1097881	1006576	999	1547	691
25-29	617933	1191083	1284694	1851	4172	1813
30-34	267665	682995	943977	1420	3964	1930
35-39	220652	541416	811022	969	2590	1763
40-44	217470	524812	792874	901	2075	1711
45-49	217353	523531	791173	898	2032	1705
<i>3rd child</i>						
15-19	11303	15058	6203	13	19	11
20-24	367201	417693	250678	382	518	190
25-29	644130	892657	609254	1083	2135	534

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Table 1 – *Continued from previous page*

30-34	388981	748706	626316	1288	3285	657
35-39	297195	602762	577195	1168	3272	627
40-44	288784	570262	563453	1135	3078	603
45-49	288442	566304	561868	1135	3049	599
parity progression ratio						
1st child	0.86828	0.95880	0.77494	0.55221	0.54465	0.16930
2nd child	0.78267	0.68425	0.50327	0.65764	0.68629	0.34017
3rd child	0.63149	0.50102	0.29917	0.34203	0.31344	0.31854
Sex ratio of each birth						
1st child	1.03061	1.08465	1.06475	1.02384	1.00941	1.01835
2nd child	1.02689	1.02184	1.04939	1.01896	1.00176	1.00697
3rd child	1.02031	1.01918	1.01570	0.99910	1.00376	1.00252
Year at migration						
before 1949				78	79	43
1949-1959				51	247	244
1960-1964				195	535	369
1965-1969				385	1147	754
1970-1974				950	1531	845
1975-1979				1419	1945	863
1980-1981				1672	1096	676
1982-1984				0	1824	1052
1985-1986				0	1318	921
1987-1990				0	2159	2668
1991-2000				0	0	6828

In descriptive statistics, the most interesting preliminary statistic involves parity progression ratio of first, second and third child for Chinese non-migrants and migrants in 1980 (China census 1982) and 1990. Emancipation hypothesis suggested that fertility level of Chinese women should bounce back if migrated to a country without births check like one-child policy in China. If this is the case, we should find averagely higher parity progression ratio for Chinese migrants than natives. However, we see lower parity progression ratio from childless to first child for Chinese migrants in three census years, but slightly higher progression ratio from first to second birth, and from second to third birth for migrants than Chinese non-migrants in 1990 and 2000, respectively.

These figures imply that other mechanism related to migration should be introduced since both migration and fertility behaviour is sensitive to age profile. Migration disruptive theory argues that fertility behaviour might be depressed or delayed during years of migration. Unfortunately, the exact immigration year into US is not available for US census 1980 and 1990, instead, we are accessible to range of years at migration. Most migration event happened around 10 years before the three US census year 1980, 1990 and 2000, so these census better captured the migration events happened after 1980, which is, after China practised one child policy. After imputing age at migration by duration of stay in the destination, we got a narrowed range of immigration years, and assumed that emmigration to the US happened in the first year of the range. A robust check would be introduced to use the last year of the range as migration year and compare the current results.

Relative timing of migration and fertility by age, cohort and period

Matching sample by age at survey and birth year, we got a 1:1 matched sample of migrants and non-migrants to make migrants group of exactly the same age and cohort structure as non-migrants. Take the transition from the first to the second birth as an example, we present relative timing of migration and birth transitions by mapping out the number of children before (above) and after (below) migration for around 8600 migrants randomly selected from 12897 migrants between 15 to 50 of cohort 1940 to 1980. There are two states represented by lighter and darker rose. Light rose represents the state of having one child, and dark rose represents having 2 children.

Before migration, younger cohort are less likely to progress to second child, while after migration we see a catch-up of progressing to higher birth order for younger cohorts controlling for age. Migrants are likely to move abroad with two children than with three children, since there are more grids filled by lighter colour in Appendix than in Figure 3. This is consistent with the maximum number of children one child policy ever allowed. This might be due to the fact that Chinese first generation international migrants are mainly from rural area with little economic resources where several relaxations of one child policy are applicable. There is a more obvious period effect for migrants after migration than before migration that, regardless of cohort, the survey year 2000 experienced a much lower overall fertility level than year 1980 and 1990 for the first generation Chinese migrants.

Results

Parity-specific birth transition

As shown in Table 1, one child policy varied across provinces, period, *hukou* status and birth parity. Generally, the third child is strictly restricted across the country except in Tibet province where herders could give birth to at most 3 children. The first child is, nevertheless, comprehensively permitted if not encouraged. The most complexed policy relaxations lie on the transition from the first to the second child, mainly “couple both being the only child could give birth to two children”, “couple either being the only child could give birth to two children” and “rural couple with the first child being girl could give birth to two children”. These policies performed as relaxations during 1980s and 1990s relative to the strict one child policy launched in 1980.

Table 3: Discrete-time Logistic Models, transition to 1st birth

	<i>Dependent variable:</i>			
	First Birth			
	Model 1	Model 2	Model 3	Model4
age	1.493***	1.500***	1.516***	1.500***

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Table 3 – Continued from previous page

	(0.017)	(0.017)	(0.017)	(0.017)
age squared	–0.028*** (0.0003)	–0.028*** (0.0003)	–0.028*** (0.0003)	–0.028*** (0.0003)
Cohorts (Ref. born 1940-1944)				
born 1945-1949	0.497*** (0.023)	0.505*** (0.023)	0.481*** (0.025)	0.522*** (0.023)
born 1950-1954	0.486*** (0.023)	0.503*** (0.023)	0.462*** (0.024)	0.557*** (0.025)
born 1955-1959	0.448*** (0.025)	0.475*** (0.025)	0.414*** (0.027)	0.469*** (0.029)
born 1960-1964	0.500*** (0.028)	0.544*** (0.029)	0.625*** (0.031)	0.369*** (0.034)
born 1965-1969	0.757*** (0.045)	0.819*** (0.046)	1.093*** (0.047)	0.598*** (0.049)
born 1970-1980	0.235*** (0.065)	0.302*** (0.066)	0.613*** (0.066)	0.161** (0.068)
Women’s Education (Ref. Primary School and less)				
secondary education	–0.784*** (0.017)	–0.745*** (0.017)	–0.798*** (0.017)	–0.759*** (0.017)
college education	–1.450*** (0.021)	–1.373*** (0.022)	–1.491*** (0.021)	–1.409*** (0.021)
missing*	–2.679*** (0.033)	–2.687*** (0.033)	–2.683*** (0.033)	–2.562*** (0.034)
Migration Status (Ref. Living in China)				
living in the US	–0.181*** (0.020)		–0.031 (0.054)	–0.215*** (0.027)
Years since migration (Ref. non-migrants or more than 3 years before migration)				
less than 3 years before		–0.389*** (0.025)		
less than 3 years after		–0.143*** (0.030)		
more than 3 years after		–0.339*** (0.027)		
Migration Status and Cohort Interaction (Ref. Non-migrant, born 1940-1944)				
living in the US:born 1945-1949			0.073 (0.065)	
living in the US:born 1950-1954			0.089 (0.062)	
living in the US:born 1955-1959			0.077 (0.065)	

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Table 3 – *Continued from previous page*

living in the US:born 1960-1964				–0.625*** (0.075)
living in the US:born 1965-1969				–1.896*** (0.141)
living in the US:born 1970-1980				–2.712*** (0.288)
One Child Policy (Ref. Only 1 child allowed)				
only 2 children allowed				0.680*** (0.047)
later-longer-fewer				–0.353*** (0.027)
no restrictions				–0.107*** (0.030)
missing*				–0.164*** (0.032)
Constant	–21.238*** (0.202)	–21.390*** (0.203)	–21.498*** (0.204)	–21.188*** (0.209)
Observations	434,258	434,258	434,258	434,258
Log Likelihood	–77,963.960	–77,837.090	–77,628.800	–77,684.090
Akaike Inf. Crit.	155,953.900	155,704.200	155,295.600	155,402.200

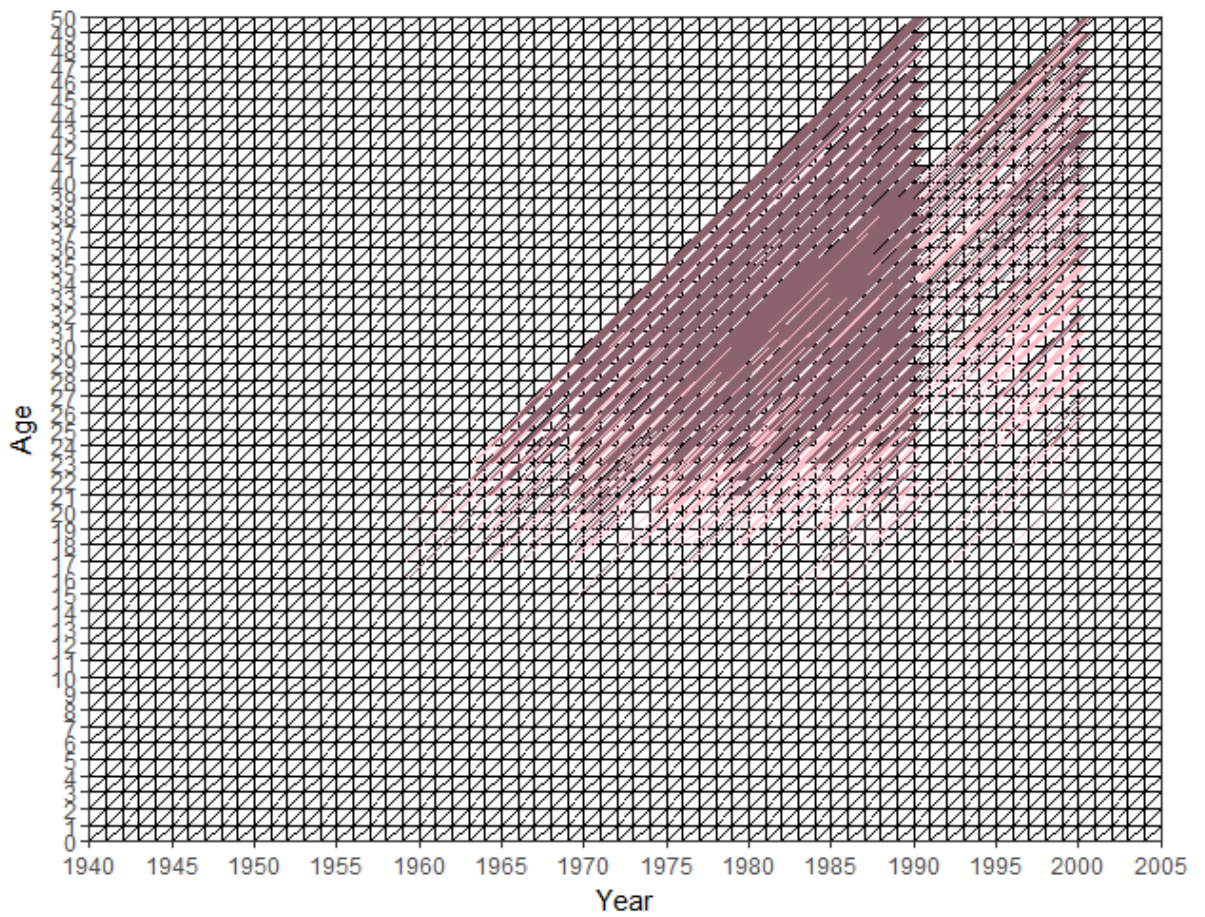
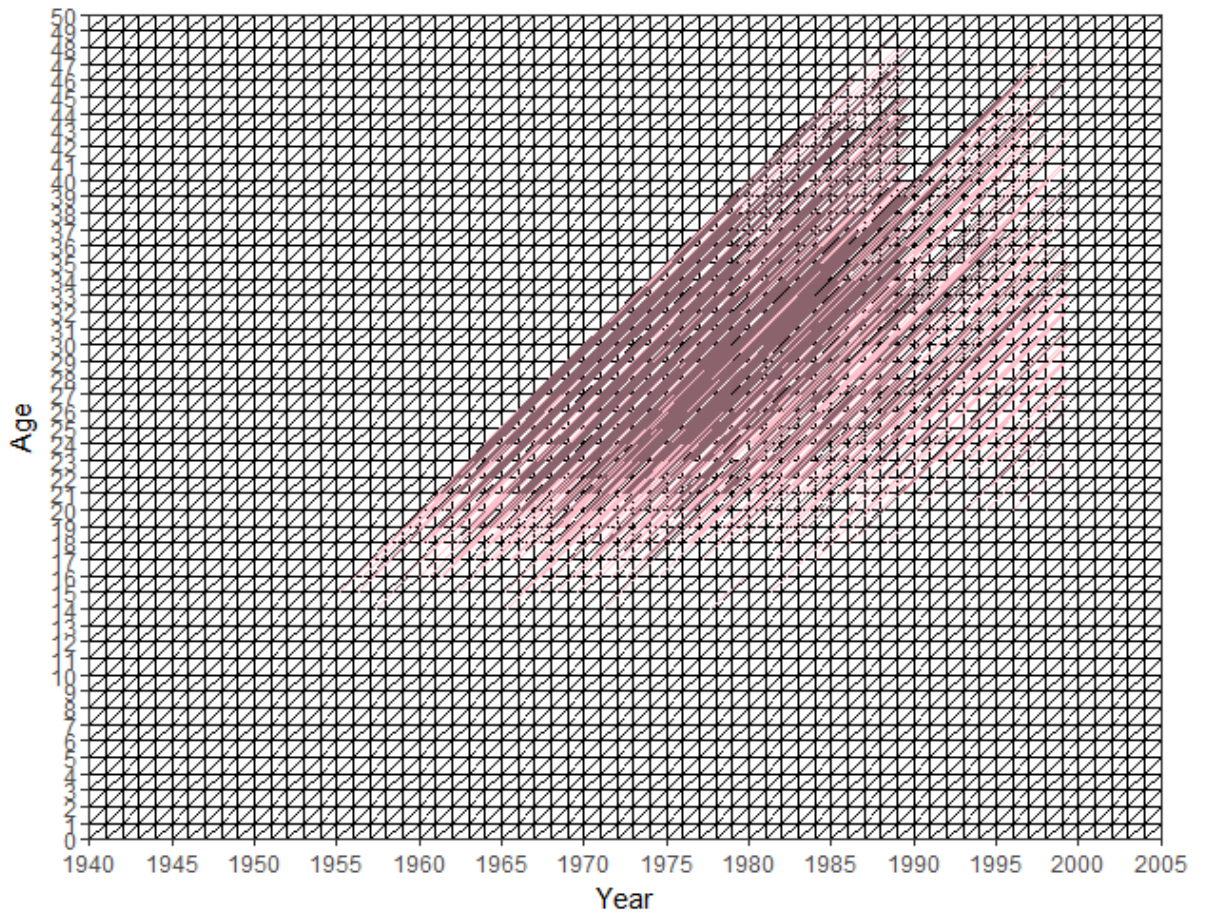
Note: missing due to incomplete China census 2000*

*p<0.1; **p<0.05; ***p<0.01

Table 3 shows four models of transition to first birth. Migration status has a negative effect on having the first child. Younger cohorts have higher probability of having the first child than older cohorts. Compared to the probability of having the first child for non-migrants and migrants more than three years before migration, chances of having the first child are lower for migrants since less than 3 years before migration on, till more than three years living in the US. This is consistent with both adaptation hypothesis and disruption hypothesis. It seems that planning to have the first child is substantially disturbed by migration for Chinese international migrants and is unlikely to recover afterwards. On dimension of education, women with secondary or college education are less like to have a child.

We introduced an interaction term of migration status and cohort to estimate if migration status works differently for females who spent various years during reproductive age under one child policy. The result shows that migrants have a lower probability of having the first child than non-migrants of the same cohort. Since the first child is not restricted at all in Mainland China all through the history, there is barely an emancipation effect detected on this birth order. Younger migrants are more likely to be childless compared with non-migrants of the same cohort. Living in the US predicts a lower probability of having the first child, or that Chinese living in the US are more likely to be childless than non-migrants in China.

Figure 3: Lexis Diagram Visualization, transition from first to second birth before (above) and after (below) migration



One child policy found its targeted fertility outcome under control on the first birth. The probability of having the first child is higher for those who are allowed to have at most 2 children than others who are allowed to have only 1 child. However, individuals without any birth restrictions, those during later-longer-fewer policy period (1974 to 1979) and migrants have lower probability of having the first child than if only 1 child is allowed.

Table 4: Discrete-time Logistic Models, transition to 2nd birth

	<i>Dependent variable:</i>			
	Second Birth			
	Model 1	Model 2	Model 3	Model 4
age	0.045* (0.023)	0.058** (0.023)	0.034 (0.023)	0.030 (0.023)
age squared	-0.002*** (0.0004)	-0.003*** (0.0004)	-0.002*** (0.0004)	-0.001*** (0.0004)
duration since last birth	0.699*** (0.016)	0.683*** (0.016)	0.706*** (0.016)	0.705*** (0.016)
duration since last birth squared	-0.068*** (0.002)	-0.067*** (0.002)	-0.069*** (0.002)	-0.067*** (0.002)
Cohorts (Ref. born 1940-1944)				
born 1945-1949	-0.137*** (0.028)	-0.145*** (0.028)	-0.122*** (0.030)	-0.097*** (0.030)
born 1950-1954	-0.343*** (0.028)	-0.355*** (0.028)	-0.379*** (0.030)	-0.177*** (0.036)
born 1955-1959	-0.725*** (0.032)	-0.723*** (0.032)	-0.858*** (0.035)	-0.213*** (0.046)
born 1960-1964	-0.889*** (0.040)	-0.882*** (0.040)	-0.979*** (0.042)	-0.079 (0.059)
born 1965-1969	-1.177*** (0.074)	-1.174*** (0.074)	-1.235*** (0.075)	-0.326*** (0.088)
Migration Status (Ref. Living in China)				
living in the US	0.652*** (0.032)		0.295*** (0.073)	0.332*** (0.045)
Women's Education (Ref. Primary School and less)				
secondary education	-0.164*** (0.022)	-0.206*** (0.022)	-0.170*** (0.022)	-0.159*** (0.022)
college education	0.047 (0.034)	-0.101*** (0.037)	0.065* (0.034)	0.016 (0.034)
missing*	-0.958*** (0.047)	-1.022*** (0.048)	-0.936*** (0.047)	-1.087*** (0.053)

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Table 4 – *Continued from previous page***Child Gender (Ref. male child)**

first child being female	0.167*** (0.018)	0.168*** (0.018)	0.166*** (0.018)	0.161*** (0.018)
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Years since migration**(Ref. non-migrants or more than 3 years before migration)**

less than 3 years before		0.178*** (0.049)		
less than 3 years after		0.473*** (0.038)		
more than 3 years after		0.833*** (0.036)		

Migration Status and Cohort Interaction**(Ref. Non-migrant, born 1940-1944)**

living in the US:born 1945-1949			–0.009 (0.086)	
living in the US:born 1950-1954			0.326*** (0.085)	
living in the US:born 1955-1959			0.933*** (0.092)	
living in the US:born 1960-1964			0.944*** (0.125)	
living in the US:born 1965-1969			0.631* (0.333)	

One Child Policy (Ref. Only 1 child allowed)

only 2 children allowed				–0.601*** (0.046)
later-longer-fewer				0.559*** (0.035)
no restrictions				0.500*** (0.045)
missing*				–0.224*** (0.046)
Constant	–1.593*** (0.309)	–1.711*** (0.310)	–1.464*** (0.308)	–2.287*** (0.325)

Observations	77,113	77,113	77,113	77,113
Log Likelihood	–36,990.640	–36,913.760	–36,890.530	–36,688.320
Akaike Inf. Crit.	74,011.290	73,861.530	73,821.070	73,414.630

Note: missing due to incomplete China census 2000*

*p<0.1; **p<0.05; ***p<0.01

Table 4 shows discrete-time logistic models of progressing to the second birth for those who already had one child, no matter in China or the US. We tracked the female migrants for at most 15 years since the year they gave birth to the first child, and censored the observations

when they "arrived" the survey year. Probability of having the second birth increases and then decreases as age and duration since last birth increases.

Younger cohorts are less likely to have a second birth. This is consistent with the trend of second demographic transition of later marriage and postponed fertility of both migrants and natives. For non-migrants, the spirit of second demographic transition was explicitly suggested through birth control policy of "later-longer-fewer", i.e., later marriage, longer spacing between births and fewer births. For migrants, it is in form of daily access to individualism and modernism in destination.

We found clear emancipation effect of migration status on a second birth. Living in the US predicts higher probability of having a second child. Compared to non-migrants in the same cohort, migrants are more likely to have the second birth. This is more found among younger birth cohorts, who if migrated, would be more likely to have a second birth. The second birth is somehow restricted by fertility policy in China, especially during one child policy period, i.e., 1980 to 2015. Younger non-migrants are more affected by one child policy, since they spent earlier and longer years during reproductive ages under one child policy, so the emancipation effect is stronger for these younger cohorts.

Women's educational attainment has similar impact on the second birth as on the first birth, that wife with at most primary education has the highest probability of having the second birth. The emancipation hypothesis could also be verified on the second birth transition, since the second birth is more likely to happen since three years before migration than more than 3 years before migration or for non-migrants.

We found a mixed effect of one child policy on the probability of second birth. The vast number of missing values caused by lack of province and household registration status information in China census 2000 might produce noise here. This limitation would be alleviated after the soon release of China census 2000 data by IPUMS. If the first child is a female, the family tends to have a second child compared with the first child being a male, implying a son preference at transition from first to second birth.

Table 5: Discrete-time Logistic Models, transition to 3rd birth

	<i>Dependent variable:</i>			
	Third Birth			
	Model 1	Model 2	Model 3	Model4
age	-0.033 (0.035)	-0.031 (0.035)	-0.043 (0.035)	-0.023 (0.035)
age squared	-0.001* (0.001)	-0.001* (0.001)	-0.001 (0.001)	-0.0005 (0.001)

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Table 5 – *Continued from previous page*

duration since last birth	0.609*** (0.022)	0.608*** (0.022)	0.617*** (0.022)	0.606*** (0.021)
duration since last birth squared	-0.065*** (0.002)	-0.065*** (0.002)	-0.066*** (0.002)	-0.063*** (0.002)
Cohorts (Ref. born 1940-1944)				
born 1945-1949	-0.463*** (0.034)	-0.473*** (0.034)	-0.503*** (0.035)	-0.320*** (0.039)
born 1950-1954	-0.886*** (0.036)	-0.898*** (0.036)	-0.969*** (0.038)	-0.487*** (0.050)
born 1955-1959	-1.227*** (0.046)	-1.239*** (0.046)	-1.343*** (0.049)	-0.413*** (0.070)
born 1960-1964	-1.430*** (0.066)	-1.437*** (0.066)	-1.521*** (0.069)	-0.355*** (0.098)
born 1965-1969	-2.002*** (0.167)	-2.024*** (0.167)	-2.045*** (0.174)	-0.897*** (0.184)
Women's Education (Ref. Primary School and less)				
secondary education	-0.237*** (0.030)	-0.255*** (0.030)	-0.236*** (0.030)	-0.235*** (0.030)
college education	0.019 (0.067)	-0.091 (0.068)	0.099 (0.066)	0.021 (0.066)
missing*	-0.663*** (0.079)	-0.665*** (0.080)	-0.688*** (0.080)	-0.765*** (0.088)
Migration Status (Ref. Living in China)				
living in the US	0.962*** (0.048)		0.376*** (0.093)	0.583*** (0.063)
Child Gender (Ref. male child)				
first child being female	0.253*** (0.025)	0.256*** (0.025)	0.252*** (0.025)	0.251*** (0.025)
second child being female	0.322*** (0.025)	0.325*** (0.025)	0.318*** (0.025)	0.318*** (0.025)
Years since migration (Ref. non-migrants or more than 3 years before migration)				
less than 3 years before		0.415*** (0.085)		
less than 3 years after		0.737*** (0.078)		
more than 3 years after		1.237*** (0.058)		
Migration Status and Cohort Interaction (Ref. Non-migrant, born 1940-1944)				
living in the US:born 1945-1949			0.440*** (0.112)	

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Table 5 – *Continued from previous page*

living in the US:born 1950-1954			0.818***	(0.114)
living in the US:born 1955-1959			1.219***	(0.147)
living in the US:born 1960-1964			1.303***	(0.244)
living in the US:born 1965-1969			0.673	(0.558)
One Child Policy (Ref. Only 1 child allowed)				
only 2 children allowed			−0.351***	(0.062)
later-longer-fewer			0.726***	(0.045)
no restrictions			0.749***	(0.062)
missing*			−0.311***	(0.074)
Constant	−0.480	−0.476	−0.292	−1.950***
	(0.500)	(0.501)	(0.498)	(0.522)
Observations	60,250	60,250	60,250	60,250
Log Likelihood	−21,390.710	−21,347.910	−21,342.920	−21,201.170
Akaike Inf. Crit.	42,813.420	42,731.820	42,727.840	42,442.350

Note: *missing* due to incomplete China census 2000*

*p<0.1; **p<0.05; ***p<0.01

Table 5 presents transition to the third birth. As similar to the transition to the second birth, on the transition to a third birth, younger cohorts are less likely to achieve 3 births than do older cohorts. Younger migrants are more likely to have a third birth compared with non-migrants of the same cohort, since the younger non-migrants are more affected by one child policy which strongly depressed the third birth than older non-migrants.

Living in the US emancipated people from radical birth control and helped to achieve a third birth. Compared to fertility level of non-migrants and migrants 3 years before migration, the probability of having a third birth increased significantly since three years before migration. Another signal of emancipation hypothesis is that migration status has a positive impact on transition from second to third birth, that average probability of having a third birth is higher for person-years outside than inside China.

Regarding the effectiveness of one child policy, those who are allowed to have only 1 and 2 children are less likely to have a third child. While others during later-longer-fewer period, without restrictions and migrants are more likely to have a third child, implying an emancipa-

tion effect. Later-longer-fewer policy suggested at most 2 children for urbanites and 3 children for rural dwellers. The extent of its depression on a third child lies between that of only 2 children allowed and no restrictions. The category of no restrictions means no control on any birth order. This variable of one child policy needs further refinement once given the access to the complete China census 2000 micro-data later on.

Similar to the previous two births, wife with lower education are more likely to have a third birth. Either the first or the second child being female significantly increases the probability of progressing to a third child, implying son preference in higher birth order.

Discussion

China's one child policy faded out of the stage on 1 Jan, 2016, signifying the end of an era which never experienced by any other single country even with high fertility level back in the history. Now it is time to review what we had been through and what if one child policy never happened in this great country. We are not arguing the fertility level of migrants refers to a hypothetical fertility level of China without one child policy, but are curious about how the Chinese would behave if freeing away from any birth controls plus a birthright citizenship in the US, and at the same time, faced all difficulties of migration and transmission of lower fertility values in destination. To our knowledge, this paper is among the first attempts to introduce emancipation hypothesis when comparing the fertility level of Chinese international migrants and non-migrants.

The power of one child policy is more sounded for the transition from the second to third birth, that individuals during later-longer-fewer period, individuals who faced no restrictions and migrants living in the US have higher probability of giving a third birth than other who are living in China and are allowed to have only 1 or 2 children. Emancipation hypothesis is verified, that living in the US promises higher probability of having a second and a third birth than living in China. The third birth is the most emancipated, followed by the second, while the first birth is depressed by migration status.

We found emancipation effect for the transition to second and third birth but not to first birth. Living in the US means lower probability of progressing from childless to the first birth, but higher probability to achieve a second and third birth. The emancipation effect for the second birth is more strong among younger cohort migrants whose non-migrated counterparts spent earlier ages and more years during reproductive ages under one child policy. Abbasi-Shavazi and McDonald (2000) found lower fertility of Chinese international migrants than Chinese non-migrants. Coleman and Dubuc (2010) found lower fertility level of Chinese international migrants than native British. This overall lower fertility level of Chinese international migrants might be attributable to the lower probability of progressing from childless to the first child.

On this birth order, no emancipation effect was found, but migrants faced strong disruption from migration.

The total fertility rate for Chinese female migrants are 1.7, 1.1 and 1.0 for period 1977-1981, 1982-1986, 1987-1991, and 2.6, 2.3 and 2.3 for Chinese natives in the same period. The period in their paper lies more or less during the one child policy period in China. Even 11 years after the release of one child policy, at year 1991, they still found a lower fertility among Chinese international migrants in Australia. This extra lower fertility of Chinese international migrants didn't attract scholars' attention to the full extent. Chinese non-migrant female's ideal number of children itself dropped gradually along with the development, urbanization and industrialization of their residence places (Merli and Smith, 2002). We warn that fertility level of both Chinese natives and international migrants are at a precariously low level.

Goldstein et.al (1997) argued that Chinese rural-to-urban migrants do not have more child than non-migrants even the former are basically out of control of one child policy, probably due to separation of spouse for the migrants. Without reporting a change of household registration, these rural-to-urban migrants are basically out of fertility check since they are absent in the villages so the cadres could not reach them, and that they are not registered as urbanites so the stricter policy is not applicable. However, it seems that Chinese rural-to-urban migrants don't move without informing of household registration change to circumvent birth control, or to say, emancipation didn't work for these rural-to-urban migrants.

This is partly consistent with our findings that international migrants living in the US are not more likely to have a child than non-migrants, but they are more likely to progress to higher birth order which is depressed by one child policy. Especially, on the third birth, Chinese international migrants do take advantage of the absence of birth control and present higher fertility level compared with their counterparts of the same cohort, whose total earlier years of reproductive age are well covered by period of strict birth control after 1980. It would be hard to estimate emancipation effect on the third birth from internal rural-to-urban migration since they are also not allowed to have any third birth like the urbanites. This is a unique result that could only be identified through the comparison between Chinese natives and international migrants.

Migration disruption on fertility is found for transition to the first birth, but not on the higher order birth, i.e., second and third birth. Possible disruptions came from economic uncertainty, couple separation, etc. Chinese International migration to the US is usually planned much in advance, since the preparation of long journey and smuggling fee, if migrated undocumented, could take several years. It is reasonable that fertility behaviour being depressed shortly before and after migration, since both giving birth and migrating is costly. The huge expenditure on migration might bring economic uncertainty to the international migrants. Also, Chinese in-

ternational couples might experienced several years of separation before reunion in destination, the wife usually comes after the husband. So lower fertility level shortly before migration could also be due to couple separation.

However, if economic uncertainty and couple separation is the main source of migration disruption, we should find similar trends of fertility on all three transitions. However, migration disruption on fertility is only found on the first birth. So this disruptive effect is more a form of delayed higher order births, to avoid birth check from Mainland China, and to meet the potential birthright citizenship in the US, than pure economic uncertainty or couple separation. Adaptation after migration plays a mixed role in migrants' fertility level after more than 3 years living in the US. Migrants are less likely to have the first birth but more likely to have a second and third birth if living in the US for more than 3 years.

As found in Goldstein and associates (1997), having a son decreases the probability to progress to a second birth implying a strong son preference, and that women with no schooling had the highest fertility level. The lesson we learnt from data preparation process is that jointly tracking migration and fertility histories of Chinese natives and migrants from 6 national census of two populous countries like China and US didn't turn out to be frustrated but rather an approach worth exploring though being time consuming and computation intensive.

In the future, it is necessary to explore to further details the disruptive and adaptation effect by checking the length of couple separation, the change of fertility before and after 1990s when the two country TFR crossed. Also, we should keep in mind that migrants are selective group, whose fertility level is not only shaped by migration per se, but also the selectivity of being a migrant. The Chinese international migrants to the US came from certain area of China, at the very beginning from Canton Province, later on came the Fujianese and then from all over China. They usually lived in rural mountainous area, with little economic resources and lower education.

Gu (2007) argued that fertility level of rural-to-urban migrants was only slightly lower than rural dwellers, and that this lower fertility was resulted by problems faced by urbanites like elderly support, employment opportunity, chances of social mobility but not by migration per se directly. Chinese international migrants face different opportunity costs of having children, employment situation and separation of couple as non-migrants in China. These selection effect should be taken into consideration in the next step.

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Appendix

Figure 4: Lexis Diagram Visualization, transition from second to third birth before (above) and after (below) migration

