

Identifying Change in Spatiotemporal Patterns of China's Internal Migration and Associated Mechanisms Since 2010

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1. Introduction

The demographics and dynamics of China's internal migration pose significant challenges for theory, empirical investigations, policy making, and practical intervention strategies. Four decades of growth and industrialisation have brought massive rural-to-urban migration. Seen initially as one-way, this migration is now largely circular. A *floating population* – some 375.8 million migrants (124.8 million inter-provincial, and 251 million intra-provincial), 26.6% of China's 1.41 billion population – live at least six months outside their registered household location, according to 2020 Census data (NBSC, 2021), and many of them have not yet acquired urban citizenship. Following the pioneering work of Chinese demographers (e.g. Zhu and Chen, 2010; Zhu and Lin, 2014), the largest internal migration of modern times (and possibly of *all* time) is now recognised as not only circular but iterative and highly diversified: an epochal *transition*, superseding a simpler rural–urban and inland–coastal migration involving little urban settlement. Increased urban settlement, inter- and intra-urban movements, and return migration are the new norm (Lin and Zhu, 2015; Lin et al. 2020; Zhu et al., 2021).

Wilbur Zelinsky's (1971) *mobility transition* thesis serves as an adaptable framework within migration studies. Still, it has been criticised as 'linear, deterministic, and Eurocentric', ignoring heterogeneity (Zhu 2018:1). Also missing from the Zelinsky hypothesis is 'the role of policy and whether governments can influence or manage the volume and direction of migration' (Skeldon 2019:399). Socioeconomic development and urbanisation in China since 2010 have ushered in a new phase: an 'advanced society' with reduced rural-urban migration and accelerating intra- and inter-urban migration (Lin et al., 2020). This counters a conventional *linear* view of migration in China (rural–urban, inland–coastal), and poses questions about emerging, dynamic, diversified movement patterns, including inter- and intra-urban migration, and *return migration* which is absent from the Zelinsky model. The *New-Style Urbanisation Plan* (2014-2020) advocates an intensive, efficient, rural–urban integration, harmonious and sustainable urbanisation model. Migrants may be urged to settle down in their destination cities or their hometowns, to contain massive net flows to larger cities. The effects of such policy developments are unclear; research now needs to focus on this phase of transition from the 'late transitional society' to the 'advanced society'. Understanding the role of policies such as the New-Style Urbanisation Plan and further relaxation of China's *hukou* (household registration, formalised in 1958) systems will be central.

Quantitative studies have relied on analysis of cross-sectional data to uncover factors determining transition; but how China's *hukou* policy and associated socioeconomic inequality influence and mediate these changes is under-researched. *Hukou* assigns individuals to *urban* or *rural* areas, *hukou* differentiation affects access to social goods such as age pension and healthcare schemes, education, and housing (Chan and Buckingham, 2008). Despite a relaxation of *hukou* since the mid-1980s, migrants remain tied to original localities for social identity and welfare services. Conditional points-systems, as implemented in some mega-cities, or making urban status subject to forfeiture of traditional land rights, can break the circularity and induce permanent moves. We do not know precisely how *hukou* and inequality influence migration transition. We lack rigorous evaluations to assess how the level of difficulty in accessing urban *hukou* across various tiers of cities and the accessibility and quality of social security schemes bear on migration decisions. Little is known about the groups and localities involved or how migration patterns are evolving (Chen and Fan, 2018). A

central concern should be the analysis of scale and patterns in the transition, to identify the precise roles of shifts in *hukou* policy (measured as different *hukou* access stringency levels across cities) and socioeconomic inequality.

Limitations in analysis and poor marshalling of data have held back efforts to close those lacunae in the empirical base. Bernard et al. (2019) analysed migration levels, patterns, and reasons for different age cohorts, but omitted the ‘new generation’ born since 1980 – a core segment of the labour force. A unique opportunity comes with recently available 2020 China Census data. Using China’s 2020 and 2010 censuses, we will analyse change in migration patterns at different scales, and the extent of return, settlement, continued migration, and long- versus short-distance movements. We will probe the causes of migration from an individual perspective and explore the effects of the *hukou* reforms or related shifts since 2010.

2. Data and methods

We conducted an analysis primarily from 1‰ China Census datasets (2020, 2010), of well-attested quality. The China Census data at disaggregated meso levels (city, urban district, county) and micro levels (individual), give the first and best opportunity to identify and analyse migration patterns in the dimensions discussed above. The census data includes two resources on internal migration: a 12-item questionnaire for all and a 48-item questionnaire for 10% of the population. Specifically, the 2020 census was the first census to collect ID card data: birth date, sex, and *hukou* status. Residential address on census night can be correlated with other variables – birth place, *hukou* registration locality, residential place 5 years ago – to define lifetime and temporary migration, and migration in 2015–2020 and 2005–2010. The dataset is cross-sectional, but identifies moves between types of origins and destinations over those 5 years. The four types of origins are communes, residents’ committees in towns, villagers’ committees in towns, and sub-districts; the three destinations: city, town, and village. Capturing temporary migration between 31 provinces of mainland China for the entire population, we constructed fine-grained origin–destination migration matrices by sex and age, between 31 provinces $\times$ 4 origins and 31 provinces $\times$ 3 destinations. Much of our census data analysis will focus on movement out of original *hukou* place, and changes in residential location and *hukou* status over the past 10–15 years. We then, for the first time, classified scales and patterns of migration outcomes.

We adapted existing circular migration indicators, especially spatiotemporal measures of intensity (capturing overall levels of propensity to move), duration, circuits, and effects of migration (Bell et al., 2015, 2020; Bernard et al., 2019; Shen, 2020). We mainly analysed regional migration patterns and determinants. Migration *intensity* in a population was calculated for cities at the county level and provinces.

General migration models were used to track the determinants of the main types of migration for 2005–2010 and 2015–2020 to reveal trends. Various micro (individual or household level) factors and macro (contextual) factors, especially reforms in *hukou* policy and the attractiveness, such as income, unemployment rate, economic growth rate, land-use type, environmental conditions (e.g. water, air pollution), and participation in social security schemes (e.g. age pension, healthcare insurance), were interrogated. The census asked about land-use rights in the *hukou*-registered area of each household member, in addition to 9 categories of reasons for leaving it. We identified broad reasons for return, for urban settlement, or circulation, and spatial variations in migrant flow profiles at provincial, prefectural, and county levels. GIS techniques will be used for visualisation and spatial analysis.

3. Expected findings

Extensive analysis will be completed in the coming three months.

This study develops profiles of migration cohorts under different forms of migration in China. It applies demographic and causal inference methods to census data. Access to uniquely comprehensive data ensures innovative modelling of policy, geographic, and individual factors in the detail and in the broad sweep of China's migration transition, benefiting international community. From patterns of return migration and circulation between origins and destinations, we map out scales and spatio-temporal migration patterns. Significant factors influencing change in the magnitude and spatio-temporal patterns of internal migration in China will be identified. Our quantitative analysis of scale in migration identify spatial patterns, and quantify complex interactions between migrant individual or household characteristics, different *hukou* access stringency levels across cities, socioeconomic inequality, and more external factors. The empirical findings will help us, with new sophistication and analytical power, formulate a *China variant* of the Zelinsky thesis (Zelinsky, 1971) to show how parallels and differences in China's mobility transition have evolved, with particular attention to the role of policy. The findings have great relevance for migration, social service, and urban development policy, in China and internationally.

Table 1. System-wide migration indicators by type of migration and by locality of *hukou* registration, 2020

Provinces	CMI (%)	MEI (%)	ANMR (%)	MER (%)
Beijing	38.42	44.52	17.11	89.04
Tianjin	21.93	22.54	4.94	45.08
Hebei	9.38	16.74	1.57	-33.48
Shanxi	8.90	15.28	1.36	-30.56
Inner Mongolia	13.29	2.31	0.31	-4.61
Liaoning	10.99	8.68	0.95	17.37
Jilin	14.19	16.06	2.28	-32.12
Heilongjiang	17.61	36.39	6.41	-72.78
Shanghai	43.11	46.28	19.95	92.56
Jiangsu	17.03	23.67	4.03	47.35
Zhejiang	32.20	40.06	12.90	80.11
Anhui	22.28	40.52	9.03	-81.05
Fujian	19.33	19.90	3.85	39.80
Jiangxi	17.94	37.94	6.81	-75.88
Shandong	7.64	0.51	0.04	-1.03
Henan	14.23	42.34	6.02	-84.68
Hubei	15.80	28.59	4.52	-57.19
Hunan	16.23	38.85	6.30	-77.69
Guangdong	26.74	45.60	12.19	91.20
Guangxi	17.36	32.28	5.60	-64.55
Hainan	13.37	18.92	2.53	37.84
Chongqing	17.57	16.93	2.97	-33.85
Sichuan	14.64	31.40	4.60	-62.79
Guizhou	20.13	32.24	6.49	-64.47

Yunnan	10.64	9.53	1.01	-19.06
Tibet	13.75	25.95	3.57	51.89
Shaanxi	11.72	13.77	1.61	-27.54
Gansu	14.86	29.46	4.38	-58.91
Qinghai	11.27	2.76	0.31	-5.53
Ningxia	12.28	15.71	1.93	31.43
Xinjiang	14.67	36.40	5.34	72.81
Total	17.40	0.00	0.00	

Table 2. Types of return migration, by city size, 2020

Types of return migration	Mega (≥10 million): %	Super large (5-10 million): %	Large_I (3-5 million): %	Large_II (1-3 million): %	Medium (0.5-1 million): %	Small_I (0.2-0.5 million): %	Small_II (<0.2 million): %	County (county seats): %	Total (persons)
Return to home village	18.4	10.9	8.5	12.2	11.3	10.5	3.5	24.6	8,432
Return to home township	19.8	11.7	7.8	11.6	11.6	11.4	2.1	24.0	1,079
Return to home county	17.7	12.3	7.2	10.7	14.0	9.3	2.7	26.1	4,174
Return to home prefecture	12.4	9.4	6.3	10.8	9.6	8.9	3.7	38.9	15,882
Return to home province	5.7	5.1	3.3	8.6	11.0	15.6	4.5	46.2	31,294
Moving to other provinces	9.5	5.7	3.9	8.6	10.5	11.5	4.1	46.2	46,914

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