



# Labor migration, human capital agglomeration and regional development in China

Yuming Fu <sup>a</sup>, Stuart A. Gabriel <sup>b,\*</sup>

<sup>a</sup> Department of Real Estate, National University of Singapore, 4 Architectural Drive, 117566, Singapore

<sup>b</sup> Anderson School of Management, University of California, Los Angeles, 110 Westwood Plaza, Los Angeles, CA 90095-1481, USA

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## ABSTRACT

We estimate a skill-based directional migration model to assess the effects of regional human capital agglomeration on labor migration in China. Upon accounting for regional differentials in skill-based compensation, cost-of-living, amenities, and the like, model estimates indicate the importance of destination human capital concentration to high-skill migrants. In marked contrast, low-skill migrants are found to have little incentive to co-locate with high-skill workers, likely reflecting institutional and other impediments to human capital investment among low-skill migrants. Research findings suggest the importance of human capital agglomeration benefits to disparate regional growth trajectories in China.

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## 1. Introduction

Internal labor migration long has been viewed as central to efficient labor allocation. Aggregate labor productivity rises as workers move from less to more productive places (e.g., Sjaastad, 1962; Gabriel et al., 1993). Further, research has demonstrated that workers relocate in response to differential returns to human capital (e.g., Roy, 1951; Borjas et al., 1992; Dahl, 2002) and that such moves ease regional disparities in both productivity and skills as arise from exogenous shocks (Borjas, 2001; Whalley and Zhang, 2004). In the development literature, numerous studies (e.g., Lewis, 1954; Ranis and Fei, 1961; Harris and Todaro, 1970) also have shown the importance of urban migration in reduction of rural–urban productivity gaps.

In this paper, we draw upon modern theories of economic growth and spatial equilibrium (Lucas, 1988; Romer, 1990; and Glaeser and Gottlieb, 2009), which emphasize increasing returns to human capital and agglomeration, to assess internal migration and regional economic development in China. In particular, we seek to provide new insights as regards disparate regional growth evidenced in China during the 1990s. Indeed, those disparities became more pronounced despite increased labor mobility and eased regulation of household location choice (see, for example, Fujita and Hu, 2001; Démurger et al., 2002; Candelaria et al., 2009; Villaverde et al., 2010). Our analysis highlights the influence

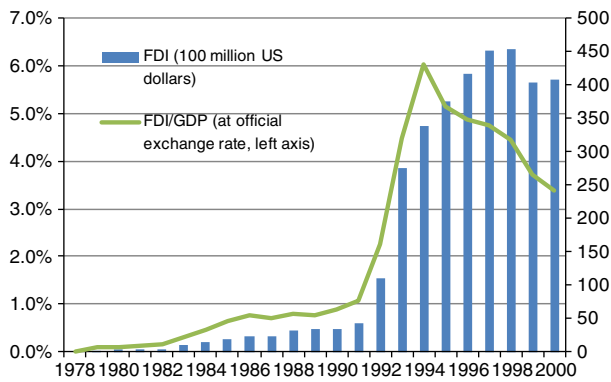
of regional human capital agglomeration on disparate regional growth via migration choices among skill-based population strata.

Regional differences in human capital concentration can affect migratory incentives in various ways. First, such differences can affect the place-specific demand for skills. Giannetti (2003) and Berry and Glaeser (2005), for example, suggest that high concentrations of skilled people in cities generate more skilled jobs. In the presence skill complementarities, wage rates for skilled workers will be higher in areas of high human capital concentration. Second, concentration of human capital supports consumer amenities, such as cultural vibrancy, that attract high-skill people (e.g., Shapiro, 2006). Third, as suggested by Lucas (1988, 2004, 2009), Eaton and Eckstein (1997), Glaeser (1999) and Glaeser and Mare (2001), the concentration of proximate human capital results in spillover benefits to private investment in human capital and ideas, which in turn contribute to higher productivity growth for city migrants. The human capital spillover benefits are of particular importance to regional growth (e.g., Glaeser et al., 1995; Gennaioli et al., 2011). Accordingly, agglomeration of human capital may provide incentives for labor migration that reinforces spatial inequality in human capital concentration and economic development. In this paper we explore the hypothesis, as suggested by theory, that human capital spillover benefits in regions of human capital agglomeration resulted in divergent rates of migration across skill-based population strata in China. Such movement of population would then exacerbate disparities in regional growth among China's provinces.

Our empirical analysis employs a utility-maximizing directional migration model, which allows for competing migration incentives as well as heterogeneous migration costs and preferences in determination of

\* Corresponding author.

E-mail addresses: [rstfuyym@nus.edu.sg](mailto:rstfuyym@nus.edu.sg) (Y. Fu), [stuart.gabriel@anderson.ucla.edu](mailto:stuart.gabriel@anderson.ucla.edu) (S.A. Gabriel).



Source: China Statistics Yearbooks

Fig. 1. Foreign Direct Investment in China (1978–2000).

mobility outcomes among population strata. Such models have been applied in the place-to-place migration literature, which offers evidence that regional differences in return to skills are important to the magnitude and to the skill composition of interregional migration flows (as in Roy, 1951).<sup>1</sup> That model has several distinct advantages relative to prior cross-sectional analyses of the effects of human capital agglomeration on regional economic growth (see, for example, Glaeser et al., 1995; Glaeser and Shapiro, 2003; Shapiro, 2006; Glaeser et al., 2011). First, directional migration analysis allows controls for destination fixed effects to account for unobserved locational heterogeneities.<sup>2</sup> Second, directional migration analysis accounts for spatial heterogeneity in destination labor supply arising from distance-sensitive migration costs. Third, application of the directional migration model focuses on gross population flows, which unlike net population growth, are less affected by regional housing supply constraints.<sup>3</sup> Finally, use of gross directional population flows allows an examination of the differential importance attached to potential human capital spillover benefits and other migratory incentives by different migrant strata, as is useful for welfare evaluation.

We apply the model to place-to-place population flow data computed from the 1995 one-percent national population survey in China. The use of this dataset is motivated in part by its unique stratification of population flows by demographic and educational attributes, which facilitates assessment of the internal migration consequences of spatial inequality in human capital concentration. More importantly, this dataset reflects the migration choices of population strata during a dynamic period of rising labor mobility, skill-based wage premia, and regional economic disparities in China. The early 1990s coincides with Deng Xiaoping's push for economic reforms and a turning point in China's integration with the global economy. Foreign direct investment (FDI) was the primary source of technology transfer associated with acceleration in China's manufacturing exports during that period, as evidenced in part by the surge in FDI between 1991 and 1995 (Fig. 1). That same period was marked by an increasing awareness of the value of knowledge and skills; as shown in Zhang et al. (2005), the return to schooling in Chinese cities rose from about 4% in 1988 to 10% in 2001, with most of the rise occurring post-1992. Hence opportunities to upgrade human capital became important among the determinants of migratory

incentives. We therefore expect destination human capital concentration to be valued both for its impact on employment opportunity and for its spillover benefits to human capital investment. We further account for regional concentration of FDI as an additional incentive for investment in human capital, which would be more profitable in places of large and rapid technological change. Despite the perceived value of human capital investment, the lack of institutional development in China posed serious impediments to human capital investment by migrant workers. In particular, low-skill migrant workers in Chinese cities often were denied formal jobs, had little social and employment security, and lacked education opportunities for themselves or their children (e.g., Wang and Zuo, 1999). Few low-skill migrants, therefore, were motivated to invest in their human capital, given their limited long-term prospects in the cities, nor were they assisted in doing so.<sup>4</sup>

Research findings suggest that spatial variation in human capital agglomeration played a salient role in explanation of disparate regional growth trajectories in China. Upon accounting for regional differentials in skill-based compensation, cost-of-living, and amenities, we find that high-skill migrants attached significant importance to human capital concentration in destination regions. This finding suggests migratory benefits arising from human capital spillover for high-skill workers. However, as expected, low-skill migrants do not appear to benefit from co-locating with high-skill workers. Accordingly, disparate migratory incentives across skill-based strata may have served to restrain regional skill convergence in China (Luo and Zhu, 2008).

The plan of the paper is as follows. We provide additional background on Chinese internal labor migration and regional economic development in Section 2. Section 3 presents the utility maximizing directional migration model applied to China's stratified place-to-place migration odds data. The labor migration and regional socioeconomic and amenity data are described in Section 4. Section 5 discusses identification issues and provides evidence of skill-based selectivity in migration choices. We conclude and highlight the welfare and policy implications of the empirical findings in Section 6.

## 2. Chinese internal labor migration background and literature

In the three decades of central planning prior to 1980, labor migration in China was directed by national economic development plans (see World Bank, 2009, p.154). A large wave of rural-to-urban migration occurred during the 1950s in the context of China's early industrialization. In the 1960s and 1970s and as a consequence of China's Cultural Revolution, labor migration was driven by relocation of coastal industries to interior provinces and by assignment of educated urban youth to rural farms. This second wave of labor migration sought to reduce regional inequality in human capital concentration. The economic recovery and reform that took place during the 1980s and in the aftermath of the Cultural Revolution was accompanied by reverse migration of large numbers of previously relocated skilled coastal workers and youth to their home cities. At the same time, rural village and township enterprises (TVEs) sought to encourage rural surplus workers to remain in the countryside, and restrictive rural-to-urban migration policies, via a system of household residential registration (*Hukou*), continued to hinder efficient urban agglomeration in China (Au and Henderson, 2006).

The 1990s were characterized by economic liberalization and elevated population mobility. The privatization of state-owned enterprises and the inflow of FDI created strong growth in private-sector employment in Chinese cities. Also, the liberalization of the land market (Fu and Somerville, 2001) and the privatization of state housing (Fu et al., 2000) allowed considerable expansion of private-sector housing opportunities. Both reforms resulted in elevated labor migration to cities. Li

<sup>1</sup> See, e.g., Borjas et al. (1992); Chiswick (1999); Chiquiar and Hanson (2005); Dahl (2002); Davies et al. (2001); Gabriel et al. (1995); and Hunt and Mueller (2004).

<sup>2</sup> Although the prior studies often use instruments to deal with potential endogeneity of human capital concentration with respect to the urban performance indicators, the endogeneity problem remains if the instruments are not orthogonal to unobserved locational heterogeneities in productive and consumption amenities that also influence the urban performance indicators (Henderson, 2007; Glaeser and Gottlieb, 2009).

<sup>3</sup> Gyourko et al. (2006) show in the case of housing-supply-constrained San Francisco, productivity and amenity shocks result in little population growth but notable changes in population mix as high-skill workers move in to outbid low-skill workers with relatively low willingness to pay for place-specific amenities.

<sup>4</sup> Employment and social discrimination against migrant workers in Chinese cities have been widely reported in news media; see, e.g., "Survey: China" *The Economist*, April 6th, 2000; "Migration in China: Invisible and heavy shackles." *The Economist*, May 6th, 2010 (print edition).

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