

# A numerical simulation analysis of (Hukou) labour mobility restrictions in China <sup>☆</sup>

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## Abstract

We use numerical simulation methods to analyze the Hukou system of permanent registration in China which many believe has supported growing relative inequality over the last 20 years by restraining labour migration both between the countryside and urban areas and between regions and cities. Our aim is to inject economic modelling into the debate on sources of inequality in China which thus far has been largely statistical. We first use a model with homogeneous labour in which wage inequality across various geographical divides in China is supported solely by quantity based migration restrictions (urban–rural areas, rich–poor regions, eastern–central and western (non-coastal) zones, eastern and central-western development zones, eastern–central–western zones, more disaggregated 6 regional classifications, and an all 31 provincial classification). We calibrate this model to base case data and when we remove migration restrictions all wage and most income inequality disappears. Results from this model structure points to a significant role for Hukou restrictions in supporting inequality in China. We then present a further model extension in which urban house price rises retard rural–urban migration. The impacts of removing Hukou restrictions on migration are smaller, but are still significant. Finally, we modify the model to capture labour productivity differences across regions, calibrating the modified model to estimates of both national and regional Gini coefficients. Removal of migration barriers is again inequality improving but less so. © 2006 Elsevier B.V. All rights reserved.

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## 1. Introduction

The statistical literature on inequality in China (Bramall and Jones, 1993; Chen, 1996; Hare and West, 1999; Jalan and Ravallion, 1998; Kanbur and Zhang, 1999; Lyons, 1991; Rozelle, 1994; Tsui, 1991, 1993, 1996, 1998a,b) is widely interpreted as pointing to growing national relative inequality in recent years. According to received wisdom based on some of this literature, the national Gini coefficient from China on income inequality has increased to over 0.4 from 0.3 over the last 15 years or so. This change coexists with more slowly growing inequality within the urban and rural segments of the economy (as measured by Gini coefficients), and also within coastal zones and inland segments of the economy. A sharp increase in the income/capita gap across these divides is usually taken to account for increased national relative inequality. Absolute poverty as measured by head count ratios and other measures consistently falls in Chinese data reflecting strong GDP growth in recent years.

A number of attempts have been made to account for this inequality change profile using statistical techniques as in the literature listed above. Econometric literature including Zhao (1999) and Shi, Sicular, and Zhao (2002) focuses mainly on the determinants of migration decisions, and not on the size of the efficiency gains involved nor impacts on wage rates in a consistent micro based structure model. Our aim here is to use numerical simulation methods to provide fresh insights on these dimensions of the issue.

We focus on the system of Hukou in China, or registered permanent residence, which is location specific. Not having Hukou in urban areas means that migrants receive no education or health benefits and cannot purchase housing, since title to it cannot be registered by them. Effectively, Hukou operates as a barrier to urban/rural migration in China and supports large regional wage differentials which labour markets do not compete away. We ask how much inequality there would have been in China without the Hukou system.

Our starting point is the literature on the global consequences of immigration restrictions (see Hamilton and Whalley, 1984). In this literature, differences in both wage rates and GDP/capita across countries are assumed to be supported by immigration restrictions in a world with country specific factor inputs and downward sloping marginal product of labour schedules for otherwise potentially mobile labour. Parameters for an assumed underlying technology are calibrated so as to be consistent with observed data on wage differentials, labour shares of income, and GDP and population by country, and counterfactuals are performed to analyze the impacts of immigration barrier removal. Assumptions that there is homogenous labour across countries or that there are efficiency differences across countries are used as alternatives in these exercises.

Here we make calculations for China as to what the impacts of removing internal (Hukou) barriers to regional labour mobility on inequality could be using data on both aggregate and regional GDP/capita using similar methods. In so doing we elaborate on the earlier methodology used to analyze global migration restrictions by using a simple basic model which we sequentially modify in further model elaborations. We first ignore inequality within regions and treat labour as homogenous both across regions and across individuals. In this model wage rates across regions are equalized when migration restrictions are moved. With region specific fixed factors, regional differences in GDP/capita do not disappear with barrier removal although they fall sharply and national inequality is much reduced. Significant efficiency gains also accrue from barrier removal in this model. We also discuss the implications of relaxing the assumption of region specific immobile capital for results.

We then introduce region specific house price effects and capture their dampening impacts on migration. This is motivated by the desire to also capture the impacts of increases in urban house prices and housing rents in China on urban–rural mobility over 10 years. We develop a two good

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