



Brain drain, brain gain, and economic growth in China[☆]



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ABSTRACT

We have used Chinese provincial data (1980–2005) to examine the effects of permanent and temporary emigration on human capital formation and economic growth in source regions. First, we find that permanent emigration is conducive to the improvement of both middle and high school enrollment. In contrast, while temporary emigration has a significantly positive effect on middle school enrollment it does not affect high school enrollment. Moreover, the different educational attainments of temporary emigrants have different effects on school enrollment. Specifically, the proportion of temporary emigrants with high school education positively affects middle school enrollment, while the proportion of temporary emigrants with middle school education negatively affects high school enrollment. Finally, we find that both permanent and temporary emigration has a detrimental effect on the economic growth of source regions.

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1. Introduction

Economists generally argue that international migration can retard the development of the source countries (Jagdish & Hamada, 1974; Beine et al., 2001).¹ As most emigrants are skilled laborers, their departure from source countries has often been described as a ‘brain drain’, a term first coined by the British Royal Society to describe the exodus of scientists from the UK to North America shortly after WWII (Gibson & McKenzie, 2011). More recently, this perception has been challenged. As reviewed by Doquier and Rapoport (2009), some argue that migration can have some positive effects including remittance of funds, incentives to undertake further schooling, and return migration after obtaining additional skills and that these factors may all contribute to the economic development of source countries.

One particular potential benefit of migration on source regions that has received increasing attention in the literature is an incentive effect on human capital formation. Described as a ‘brain gain’, this suggests that the emigration of skilled laborers may provide an incentive for those left behind to invest in human capital, which, according to the endogenous growth theory, is one of the key determinants for long-term economic growth. When decisions to invest in education are made in light of future

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¹ See Doquier and Rapoport (2009) for a survey on the ‘brain drain’ effect.

migration opportunities, this kind of 'brain gain' is more likely to occur (Beine et al., 2008, 2011; Corrado & Stryszowski, 2009; Mayr & Peri, 2008).

Early cross-country studies have provided some macro-evidence for the existence of 'brain gain' (Beine et al., 2001, 2008, 2011; Clemens, 2007; Stark et al., 1997; Vidal, 1998). More recently, however, the debate on 'brain drain' and 'brain gain' has intensified with the accumulation of micro-evidence from household surveys or censuses that have allowed an examination of the causal mechanisms between migration and human capital formation in regions of origin. Five potential mechanisms have been proposed (Mckenzie & Rapoport, 2011): First, migrant remittances can help in alleviating the barriers of household credit constraint that may prevent households from sending their children for further schooling. Second, the prospects of skilled migration can increase the expected returns from education creating greater incentive for education. Some would call this a wage premium effect. Third, an existing network of skilled migrants can facilitate further migration by reducing transaction costs and risk by information sharing and informal support. Fourth, negative effects are likely from parental absence and the lack of parental care, support, and guidance. Fifth, further negative effects can occur if emigration increases the value of local child labor encouraging children to drop out of school. This has been termed the 'labor substitution effect'. Separating the influence of these five mechanisms can be difficult (Mckenzie & Rapoport, 2011).

Recent literature points to the positive effects of skilled migration on human capital formation.² Gibson and McKenzie (2011) have reviewed several studies supporting the benefits of 'brain gain'. Batista et al. (2012) reported that the educational level achieved by students in Cape Verde in 2006, was influenced by the potential for their future immigration. Specifically, a 10 percentage point increase in the probability of future migration improved the average probability of completing intermediate secondary schooling by 8 percentage points for those individuals not migrating before the age of 16 years. Clemens and Tiongson (2013) have utilized a regression discontinuity design method a break occurring in 2005 in a migration program to send skilled Filipino migrants to high-wage jobs in South Korea. They found that parental migration substantially increased the likelihood that their children would become enrolled in private schools and receive awards. Moreover, the benefits of parental remittances appeared to overcome any deleterious effects from the lack of parental care. Dinkelman and Mariotti (2014) similarly took advantage of a natural experiment in the migration of Malawians to South African mines in the 1970s. Using census data from Malawi in 1998, they were able to show that a greater exposure to international labor migration contributed to a 1.4–1.8% increase in the total years of education and a 2% increase in primary schooling attainment among age eligible cohorts. Their study also provides suggestive evidence for a 'labor substitution' effect on children's education especially in districts where child labor could be substituted for adult male labor. Theoharides (2014) examined the relationship between destination-specific migrant networks across local labor markets in the Philippines in 1993 and subsequent migration between 2004 and 2009. Theoharides concluded that the effect of remittances was dominant rather than the effect of premium wages because both female and male school enrollment responded similarly. Shrestha (2011) exploited an exogenous change in 1993 in the educational requirements for Nepalese Gurkha recruits into the British Army to show that for males, a rise in educational requirement increased the probabilities of completing primary and secondary school education. Chand and Clemens (2008) also found that incentives for Indo-Fijians to acquire education in order to emigrate after the 1987 coup in Fiji led to increases in 13th grade education and in Bachelor degrees but that these effects were not evident among the indigenous Fijians.

When job opportunities in regions receiving migrants are informal and low-skilled, incentive effects on education appear to actually be reversed. The availability of low-end jobs with minimal education requirements and relative high wages can lower incentives to invest in education. The net effect will depend on whether the positive influence of remittances is sufficient to counteract this disincentive. Evidence in the literature in regard to this has been equivocal. McKenzie and Rapoport (2011) found that living in a Mexican household where migration occurs lowers the chance of boys completing junior high school and of boys or girls completing high school. The observed decrease in schooling could be related to the ready immigration of boys and an increase in household responsibilities for the remaining girls. In a contrasting study also in Mexico, Hanson and Woodruff (2003) found that children in households where migration occurs complete significantly more years of schooling, an effect ranging from an additional 0.2 to 0.9 years. The effect was greatest for disadvantaged girls in households where the parents had low levels of education. Kandel and Kao (2001) found that international migration to the USA for menial jobs could be a double-edged sword: it improved children's academic performance at school but also dampened their aspiration for further college education.

Few studies have tried to distinguish the effect of permanent emigration from that of temporary emigration on human capital formation in source countries or to relate this to the varied education of the emigrants. As Beine et al. (2008) have pointed out, the recent debate on the advantages of 'brain gain' may be partly due to the absence of reliable cross-country data on international migration as stratified by educational levels.³ Finally, even if the 'brain gain' effect exists, it does not automatically imply that emigration will have a positive effect on economic growth. For example, if human capital formation is emigration-oriented, the positive effect of human capital investment will not be fully earned by the source regions.

This paper examines the effects of both permanent and temporary emigration on human capital formation and economic growth in the source regions. To achieve this end, we take advantage of the availability of Chinese provincial data. These provide several benefits. First, they may avoid statistical inconsistencies that prevail in many cross-country regressions. Currently, China has 31 regions, each of which complies with the same statistical methodology.⁴ Although we must then focus on domestic migration rather

² As shown in the section below, skilled migration may refer to different levels of education depending on the local context. In Malawi, skilled migration refers to the movement of individuals who have completed primary education whereas in the Philippines it requires at least a high school education (Dinkelman & Mariotti, 2014; Theoharides, 2014).

³ This kind of migration data has become available only very recently (see Docquier & Marfouk, 2005).

⁴ In the Chinese context, we define *regions* as units at the provincial level. These include 23 separate provinces, plus four municipalities directly ruled by the Central Government, and five autonomous regions. The terms 'provincial' and 'regional' are used interchangeably in this paper.

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