China Economic Review 39 (2016) 15–30

Contents lists available at ScienceDirect

China Economic Review

Rural-led exchange rate appreciation in China☆

Gordon Menzies [a], Sylvia Xiaolin Xiao [b,*], Peter Dixon [c], Xiujian Peng [c], Maureen Rimmer [c]

[a] University of Technology Sydney, Australia
[b] University of Wisconsin–Madison, United States
[c] Victoria University, Australia

ARTICLE INFO

Article history:
Received 1 May 2015
Received in revised form 1 March 2016
Accepted 1 March 2016
Available online 18 March 2016

JEL classification:
F11
F31
F43

Keywords:
Exchange rates
Dual economy
Balassa–Samuelson Effect
China

ABSTRACT

The departure of a factor in excess supply in a non-traded rural sector leads to a Rural-led Exchange Rate Real Appreciation (RERA), in a dual economy setup. The RERA highlights for the first time a potential link between intra-national factor movements and real exchange rates. In China, where there is excess labor employed in the production of (largely) non-traded rural goods, we attribute around one third of the recent appreciation of the real exchange rate – defined as the relative price of nontradables – to a RERA effect.

1. Introduction

This paper aims to build a dual-economy model to show how China's structural transformation affects its real exchange rate. As the 2nd largest economy by GDP, but still a dual economy, China's structure transformation and exchange rate movement matter considerably to the world economy. Since China opened up its economy in 1978, its rapid growth has been accompanied by ongoing institutional reform and structure changes, including labor market and exchange rate regimes.

In this paper, we argue that a simple modification to a dual-economy model of intra-national labor movements predicts a real exchange rate appreciation — what we call a Rural-led Exchange Rate Appreciation (RERA). Our modification is to assume that the rural sector is dominated by the production of non-traded output (nontradables), and the urban sector is dominated by the production of traded output (tradables). The RERA prediction draws together a number of different strands of literature as follows.

1.1. Agricultural surplus labor and growth

Papers descending from Lewis (1954) and Jorgenson (1961) have focused on the growth transition of developing countries. As a reaction to perceived limitations of single sector models of growth, and in keeping with the high negative correlation between

☆ The authors would like to thank Rabah Amir, Leon Berkelmans, Adam Cagliarini, Mei Dong, Taya Dumrongrittikul, Susumu Imai, Mario Fiorini, Adrian Lee, Elizabeth Savage, Frances Stewart, David Vines, John Wooders and seminar participants at 2012 Australian Conference of Economists and University of Technology, Sydney, for valuable suggestions and comments on our draft paper. We also acknowledge the assistance work of Yinhua Mai. And Xiao acknowledges the funding support from Dan Searle Fellowships since August, 2015.

* Corresponding author at: Department of Economics, University of Wisconsin–Madison, United States.
E-mail address: xxiao37@wisc.edu (S.X. Xiao).

http://dx.doi.org/10.1016/j.chieco.2016.03.001
1043-951X/

economic development and agriculture's share of GDP (Vollrath, 2009), these scholars proposed that the relationship between the agricultural and manufacturing sectors was a key determinant of the growth trajectory.

"… A model with only one producing sector] rules out much of what is interesting about growth and development, at least if the empirical and institutional literature is any guide. A few examples of 'special situations' or 'unsolved problems' created by concentration on a single output or a single production relation are: balance between industries in economic growth, imbalance between advanced and backward countries in international trade and the development of a dual economy, that is, of an economy with an advanced or modern sector and a backward sector as well." (Jorgenson, 1961, pg 310).

Various configurations of the "advanced" and "backward" sectors have been proposed under what has been called the "Lewis model" (Lewis, 1954), with key modeling choices relating to the technologies and institutions of the sectors, and to the behaviors of individuals contemplating migration to the city (Ranis & Fei, 1961; Fei and Ranis, 1964; Harris & Todaro, 1970).[1]

An example of a recent paper in this strand of literature is Hayashi and Prescott (2008). They argue that pre war Japanese primogeniture restrained Lewis-style rural emigration and held back economic growth. In support of their modeling setup, which clearly violates the application of the equal-marginal principle to labor, they cite recent papers in the field of Development Accounting which suggests that in many countries the allocation of labor and capital is inefficient, evidenced by the fact that their marginal products are not equated across sectors.[2]

Vollrath (2009) in particular has made a compelling case that such inefficiencies exist between rural and urban labor allocations in many countries. Table 1 lists estimates of the ratio of the marginal products of labor in the industrial sector to the marginal product of labor in agriculture. As a cross-check Vollrath collected any available data on the ratio of industrial wages to rural wages, and found a correlation of 0.81 ($P<0.01$). The Table is suggestive of higher misallocation in non-OECD countries, which generalizes Hayashi and Prescott's story that development involves the removal of these misallocations.[3]

Drawing on Table 1, our own dual-economy configuration of the 'advanced' and 'backward' sectors stipulates an exogenous barrier that prevents labor mobility to the city. As an example, we will focus on the rural–urban migration of labor in China. We posit that the Household Registration (or *hukou*) system in China stops the ratio of marginal products falling, and, stems the flow of rural workers to cities, much as primogeniture did in the setup of Hayashi and Prescott (2008).[4]

1.2. Surplus labor often produces nontradables

We take as an implication of the 'food problem' literature (Schultz, 1953) that many developing countries have excess workers in subsistence agriculture producing food, which is nontraded by definition. Gollin et al. (2004) make this case, drawing on the UN Food and Agriculture Organization (FAO) data. In all developing countries, agriculture employs 55% of workers, and in the 65 poorest of these, the share is closer to 60%. For a number of countries (including Rwanda, Burundi, Burkina Faso and Nepal) over 90% of workers are in agriculture. As to what the rural workers produce:

"Some agriculture is devoted to producing non-food crops and export crops, which might challenge our underlying assumption that the agriculture sector essentially produces food for domestic consumption. But it turns out that in most poor countries, agricultural land and labor are overwhelmingly devoted to food production — and specifically, to meeting the subsistence needs of the population. For example, FAO reports that in 2000, 68.6 percent of arable land in 159 developing countries was devoted to staple food crops: grains, pulses (beans, peas, lentils, etc.), roots and tubers …" (Gollin et al., 2004, pg. 7).

One could debate the status of China as a developing country and hence the relevance of this quote, were it not for the fact that there is compelling and independent evidence that rural output is indeed nontraded in that economy. In Dumrongrittikul (2012), the rural sector of China is classified as non-traded. That is, the average of the import and export share is less than 10%, the generally accepted cutoff (De Gregorio et al., 1994).

1.3. Balassa–Samuelson effect and China's exchange rate

In another literature, dual economies appear as a modeling device in open economy macroeconomics and international trade theory. Within this literature there is cluster of existing ideas invoked to explain what is usually called the Balassa–Samuelson effect (Balassa, 1964; Samuelson, 1964).[5] This is the phenomenon whereby countries with higher productivity in tradables

[1] Rural–urban migration is the defining mechanism in Lewis (1954). The migration is due to the accumulation of urban capital, given a constant socially-determined wage in the rural sector. The papers by Fei and Ranis describe in detail how rural labor market conditions evolve when the socially determined wage is abandoned, and finally begins to rise at the so called Lewis turning point. Thereafter the relationship of the rural wage becomes more closely aligned to the marginal product and the economic development dynamic draws to a close. Harris and Todaro (1970) explain persistent urban–rural wage differential by an employment lottery. Some rural workers, faced with a choice between a certain rural wage and an uncertain urban wage, hesitate which allows a wage premium to remain in place for urban jobs.

[2] See Caselli (2005) for a literature review and Restuccia et al. (2008) for a recent dual-economy productivity model.

[3] The non-OECD mean (5.3) is significantly higher than in the OECD (2.8) in a t-test with unequal variances ($P = 0.0055$).

[4] The Hukou system has been a central instrument of the command economy since its inception in 1958, to prevent "undesirable" rural-to-urban migratory flows (Chan, 2010). The regulation decreed that all internal migrating be subject to approval by the relevant local government. Each person has a Hukou, classified as "rural" or "urban", in a specific administrative unit. The Hukou system limited the rural–urban labor mobility and also excluded rural population from access to state-provided goods, welfare, and entitlements. Since 1978, China has relaxed Hukou system, particularly in small and medium-size cities. However, in general, Hukou system still matters considerably in big cities and prevents free labor mobility between rural and urban sectors.

[5] Samuelson himself, in a self-effacing moment (Samuelson, 1994), calls it the Penn effect (Milton & Kravis, 1954). He suggests a fair title would be a Ricardo-Viner-Harrod-Balassa-Samuelson-Penn-Bhagwati-et al. effect, while Obstfeld and Rogoff (1996) opt for Harrod-Balassa-Samuelson with a footnote acknowledgement of Ricardo.