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Real exchange rate, productivity and labor market frictions

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We extend the classic Balassa–Samuelson model to an environment with search unemployment. We show that the classic Balassa–Samuelson model with the assumption of full employment emerges as a special case of our more generalized model. In our generalized model, the degree of labor market matching efficiency affects the strength of the structural relationship between the real exchange rate and sectoral productivity through influencing labor's choice between employment and unemployment as well as movement across sectors. When the relative labor market matching friction is high, search unemployment is high and the standard Balassa–Samuelson effect may not hold. Empirical evidence supports our theory: controlling for differences in labor market frictions across countries provides a better fit in estimating the Balassa–Samuelson effect.

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1. Introduction

The relative price of a common basket of goods between two countries, the real exchange rate (RER), is one of the most important prices in an open economy. Balassa (1964) and Samuelson (1964) argue that deviations from Purchasing Power Parity (PPP) may be due to international productivity differentials between the tradable and nontradable sectors. Balassa and Samuelson posit that, as the law of one price holds only for tradable goods, in a fast-growing economy, higher productivity growth in the tradable sector will increase real wages in all sectors since employed workers are mobile across sectors,

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which will lead in turn to an increase in the relative price of nontradable goods, resulting in an overall rise in the national price level.¹

Although the Balassa–Samuelson model predicts a simple theoretical relationship between productivity differences and real exchange rates, the empirical evidence is mixed. On the one hand, the evidence of the Balassa–Samuelson effect is weak for developed economies. For example, an influential study by Engel (1999) finds that the relative price of nontradable goods cannot explain much of the movement of OECD countries' real exchange rates even after changes in the terms of trade (or the short-term effects from tradable sectors) are well controlled. On the other hand, there is considerable evidence for the Balassa–Samuelson effect across developed and developing economies; see Bergin et al. (2006) and Rogoff (1996), among others. Bergin et al. (2004) show that the Balassa–Samuelson effect is not visible in early 1900s, but the effect grows steadily over time to rather large values in the more recent years.

The mixed evidence for the Balassa–Samuelson effect demands further investigation. One of the underlying assumptions of the Balassa–Samuelson model is that labor markets are frictionless so that there is always full employment. Yet, it is well recognized that it takes time and other resources for an unemployed worker to find a job and for a firm to fill a vacancy so that there exist frictions in the labor market at steady state (see for example, McCall, 1970; Diamond, 1982; Mortensen, 1982; Pissarides, 1985; Mortensen and Pissarides, 1999; Pissarides, 2000; Rogerson et al., 2005) and that there are significant differences in the degree of labor market frictions across sectors and countries. In fact, using sectoral data, Wacziarg and Wallack (2004) show that trade liberalization has far smaller effects on intersectoral labor shifts than is often presumed. The existence of labor market frictions affects the response of employed workers' wage to changes in relative productivity, but it is not clear how differences in labor market institutions across sectors and countries can affect the relationship between the real exchange rate and productivity differentials.

By introducing search unemployment into a standard Balassa–Samuelson model, we demonstrate in this paper that the degree of labor market matching efficiency across sectors and countries affects the strength of the structural relationship between the real exchange rate and sectoral productivity differentials through influencing labor's choice between employment and unemployment as well as movement across sectors. When the relative labor market matching efficiency is low, search unemployment is high and the standard Balassa–Samuelson effects may not hold. Specifically, in a world with labor market frictions and unemployment, the standard Balassa–Samuelson mechanism may have to be revised to incorporate the fact that workers cycle between employment and unemployment in each sector. In such an environment, employed workers no longer move instantaneously and costlessly across sectors in response to changes in productivity and relative sectoral wages. Instead, it is unemployed workers that move freely across sectors in response to changes in expected lifetime income arising from changes in relative sectoral wages and associated frictional costs such as the probability of finding a new job and of an existing job being destroyed. Thus, an increase in the relative productivity in the tradable (or nontradable) sector may lead to an increase in the relative wage in that sector, but the extent of the increase would, in general, be lower compared with what is predicted by the standard Balassa–Samuelson model, as part of the increase in the marginal product of labor will be used to cover frictional costs in the labor market. The increase in the wage of the tradable sector will lead to an increase in the expected lifetime income of unemployed workers searching in the tradable sector, attracting unemployed workers in the nontradable sector to move to the tradable sector. This movement of unemployed workers across sectors will continue until the expected lifetime income of unemployed workers searching in each sector is equalized. The resulting increase in the expected lifetime income of unemployed workers in the nontradable sector may bid up wages of employed workers in the nontradable sector.

¹ Recent empirical investigations of the effect of productivity shocks (which are real shocks) on the real exchange rate, the so-called Balassa–Samuelson effect, include, inter alia, Asea and Mendoza (1994), De Gregorio et al. (1994), Froot and Rogoff (1995), Lothian and Taylor (2008) and Canzoneri et al. (1999). Although a survey of empirical findings by Froot and Rogoff (1995) finds weak support for the Balassa–Samuelson effect, recent work by Lothian and Taylor (2008) using data from 1820 to 2001 for the US, the UK and France in a nonlinear framework reports a statistically significant Balassa–Samuelson effect which explains 40% of the variation of sterling-dollar exchange rate. Asea and Mendoza (1994) and Canzoneri et al. (1999) also provide similar results to support the proposition that productivity differentials determine the relative price of nontradables.

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