

Forthcoming *Review of International Economics*

The Balassa-Samuelson Model: An Overview *

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March 25, 1994

Working Paper # 710

*This special issue is dedicated to the memory of Bela Balassa whose death in May 1991 deprived the profession of an outstanding researcher and inspiring teacher. We are grateful to Anusha Chari, Federico Sturzenegger and contributors to the special issue for valuable comments and suggestions. Any errors and omissions are our joint responsibility. **Correspondence to:** Patrick K. Asea, Assistant Professor, Department of Economics; University of California, Los Angeles; 405 Hilgard Avenue, Los Angeles CA 90024. *Internet:* aseas@sscnet.ucla.edu

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Abstract

This paper introduces a special issue marking the thirtieth anniversary of the publication of two classic papers in international economics, Balassa (1964) and Samuelson (1964). We provide a brief analytical treatment of the basic model and an overview of the contributions in this special issue. The papers include novel empirical and theoretical approaches related to the Balassa-Samuelson model. Theoretical models include dynamic two-sector growth models, two-country general equilibrium models and open-economy models with imperfectly competitive nontraded goods sectors. Several papers exploit new sources of data or datasets constructed in new ways from traditional sources.

Keywords: Real Exchange Rates, Productivity Differentials, Tradables, Nontradables.

JEL Classification System: F41 (Macroeconomic Aspects of International Trade and Finance)

“Under the skin of any international economist lies a deep-seated belief in some variant of the PPP theory of exchange rates.” [Rudiger Dornbusch & Paul Krugman 1976, p.540]

I. Prologue

It is well known that the exchange rate, which is arguably the single most important price in an open economy, is intimately related to the concept of purchasing power parity (PPP). PPP is a theory of exchange rate determination, is widely used in policy-making deliberations and serves as a conversion factor in transforming currency values from one denomination to another. However, despite the widespread use of PPP in exchange rate issues, the relationship between the two is the subject of heated debate. Consequently, PPP and real exchange rate issues, remain central research topics in international economics.

This special issue marks the thirtieth anniversary of the publication of two classic articles in international economics, *The Purchasing Power Parity Doctrine: A Reappraisal*, by Bela Balassa and *Theoretical Notes on Trade Problems* by Paul Samuelson. Widely referred to as the Balassa-Samuelson model, these two articles provide the canonical frame of reference for discussing links between PPP, exchange rates and inter-country real income comparisons. This special issue brings together a collection of articles that evaluate the legacy of these seminal articles and highlight the state-of-the-art in international economics related to the Balassa-Samuelson model.

Balassa [1964] and Samuelson [1964] independently provided what has come to be regarded as the definitive explanation of why the absolute version of PPP is flawed as a theory of exchange rates.¹ The absolute version of PPP relies on spatial arbitrage in an integrated, perfectly competitive world economy to equalize the relative prices (in different currencies and locations) of a common basket of goods when quoted in the same currency.

To illustrate this, let p_i and p_i^* represent the price of the i th good at home and abroad respectively. Define the exchange rate, e , as the number of units of domestic currency per unit of foreign currency. Let P and P^* be the aggregate price level at home and abroad quoted in their respective currencies. Consider a domestic price index $P = h(p_1, \dots, p_i, \dots, p_n)$ and a foreign price index $P^* = f(p_1^*, \dots, p_i^*, \dots, p_n^*)$.

Absolute PPP holds if in the absence of all frictions the prices of each good in domestic currency are equalized across countries. If the same goods enter each country's market basket with identical weights then the law of one price extends to aggregate price levels, yielding, $e = P/P^*$.

The absolute version of PPP therefore predicts that in the absence of all frictions the prices of a common basket of goods in the two countries measured in a common currency will be the same at all times, i.e., $P/eP^* = 1$. Balassa and Samuelson identified an important factor that introduces systematic biases into the relationship between exchange rates and relative prices. The crux of their analysis was identifying productivity growth differentials between the tradable and nontradable sectors as instrumental in altering a country's internal price structure.

Balassa and Samuelson argued that a high income country is technologically more advanced than a low income country. Yet the technological advantage is not uniform across sectors. The technological advantage of the high income country is greater in the tradable sector than in the nontradable sector. By the law of one price, the prices of tradable goods will be equalized across countries. However, this would not be the case in the nontradables sector, where the law of one price does not hold. Increased productivity in the tradable goods sector will increase real wages and as a result lead to an increase in the relative price of nontradables. Long-run productivity differentials would thus lead to trend deviations from PPP.

Balassa and Samuelson also examined the effect that deviations of exchange rates from PPP have on inter-country income comparisons. Balassa provided empirical evidence that the real price structure of a large group of countries shows a systematic correlation with the level of per-capita income. In particular, the lower the per-capita income of a country the lower the domestic price of services. This reasoning runs counter to the predictions of the absolute version of PPP that states that exchange rate conversions based on PPP yield unbiased income comparisons.

The results of both papers hinge on two powerful insights. The first, is that the introduction of nontradables into standard trade models was necessary to understand the relationship between exchange rates and relative prices. The second is (the empirically verifiable fact) that productivity differentials between the tradable and nontradable sectors introduce systematic biases into the PPP-exchange rate rela-

II. The Original Model

In this section we briefly outline the essential features of the basic model as developed in Balassa [1964].⁴ The original treatment was in terms of a traditional Ricardian trade model amended to include non-tradable goods.⁵ Balassa assumed a two-country, two commodity world with one scarce factor, labor, and constant input coefficient technology. To illustrate the basic propositions of the Balassa-Samuelson model we recast the model in a more general setting.⁶

Consider a small open economy that uses capital and labor to produce tradable goods (T) priced in world markets and nontradables (NT) priced in the domestic market. Both capital (K) and labor (L) are perfectly mobile across sectors domestically. Labor is immobile between countries whereas capital is perfectly mobile internationally.

