

International Migration, Segmented Labour Markets and Competitiveness:
Amalgamating the Lewis and Balassa-Samuleson Models

Richard P.C. Brown and Karen R. Hooper*

Abstract

We integrate three hitherto unconnected strands of economic theory; Lewis' dual economy model, the Balassa-Samuelson model and, segmented labour market theory. With our hybrid model we investigate the implications of migration with labour market segmentation for an economy's internal competitiveness, where migrants are concentrated in the secondary labour market and this segment supplies unskilled labour to the non-traded goods and services sectors. Our model reveals a number of original and counterintuitive insights that conventional models are unable to address. We show how international migration allows an economy to prevent appreciation of its real exchange rate, forestalling the loss of competitiveness predicted by Balassa-Samuelson to accompany economic growth. The essential transmission mechanism is through the relative prices of traded to non-traded goods, rather than unit wage costs in the traded goods sectors.

Key Words: Lewis model; international migration; segmented labour markets; relative productivities; Balassa-Samuelson model; real exchange rates; internal competitiveness; (non-)traded goods

May 2004

* Respectively, Associate Professor, School of Economics, The University of Queensland, Brisbane 4072, Australia, and, PhD student in the School of Economics, The University of Queensland. Corresponding author's e-mail address <r.brown@economics.uq.edu.au>

1. Introduction

Approximately 175 million people currently live in a country other than their country of birth; more than twice as many as in 1975. From a regional perspective Europe, Asia and North America are the most important destinations for migrants. However, it is estimated that only about 40% of migrants live in OECD countries. As a recent OECD report notes:

The 1990s and the beginning of the new millennium confirmed the increasing role of migration in the context of economic globalisation. ... Geopolitical changes of the past decade ... have enlarged the geographical frame of reference for international migration. Moreover, an increasing number of immigrants from Asia, sub-Saharan Africa and Central and Latin America, have fuelled the flows heading to several OECD Member countries. (OECD, 2003: 14)

While a large part of the migration flows to OECD countries are of skilled workers, in the Asian region unskilled labour represents the largest flow of migrant. The Asian 'miracle economies' of Hong Kong, Singapore, South Korea and Taiwan, as well as other rapidly growing economies such as India and Malaysia, have become major destination countries for unskilled workers from the less developed Asian economies. Despite the substantial increase in the numbers of individuals migrating, especially in the last 15 years, the economic significance of international labour migration remains one of the least researched features of globalisation in the recent economics literature.

This paper addresses one aspect of the impact of international migration on the receiving country; namely, the implications for its internal competitiveness.

Lewis, in the original exposition of his dual economy model, recognises the potential significance of international migration, especially of unskilled workers, in postponing the 'turning point' at which the labour supply curve for the modern sector ceases to be perfectly elastic; ie. when labour is no longer in unlimited supply and the surplus generated by the modern sector begins to decline (Lewis, 1954). He argues:

Instead of concentrating on one country, and examining the expansion of the capitalist sector, we now have to see this country as part of the expanding capitalist sector of the world economy as a whole ... (Lewis, 1954, p. 176)

He then rejects immigration as a realistic option on the grounds that:

Trade unions are bitterly hostile to immigration, *except of people in special categories*, and take steps to have it restricted. ...[and] The export of capital is therefore a much easier way out for the

capitalists, since trade unions are quick to restrict immigration, but much slower in bringing the export of capital under control (p.177; our emphasis).

What Lewis neglects, or at least underestimates, are the implications for international migration of the immobility of capital in certain sectors of the economy, namely, non-traded goods and services. By definition such goods and services cannot be produced off-shore for importation back to the capital-exporting country. It is precisely in these sectors, such as construction, domestic and personal services, retail trade, for example, that immigrant labour is most heavily concentrated. Even in countries where there are strict controls on immigration, such as Japan and Korea, exceptions are often made for unskilled labour in these sectors or as, to extend Lewis' term, *special categories* of the workforce.

It is also interesting to note that in Lewis' 1979 refinement of the original dual economy model he introduces a segmented labour market in the modern sector ("bad jobs" and "good jobs") in response to criticisms of his model not being able to explain the often observed large earnings differential between workers in the modern and traditional sectors. As Piore (1979) and others have noted, migrant labour is also often associated with labour market segmentation, where unskilled migrants tend to be concentrated in specific categories of jobs at the lower end of the labour market. Lewis' "bad jobs" or, in the international migration literature, the so-called "3D" jobs - dirty, dangerous and demanding - are increasingly shunned by the endogenous labour force as their supply becomes more scarce with development of the industrial, traded goods sectors in which the "good jobs" of the primary labour market are concentrated.

In this paper we integrate three hitherto quite separate and unconnected strands of economic theory: from development economics, Lewis' dual economy model (Lewis, 1954; 1979); from open-economy macroeconomics the Balassa-Samuelson model of real exchange rate determination (Balassa, 1964); Samuelson, 1964); and, from labour economics Doeringer and Piore's (1971) theory of segmented (dual) labour markets. With our hybrid model - a dual economy and dual labour market modified Balassa-Samuelson model - we are able to investigate the implications for a developing economy's internal competitiveness of international migration with labour market segmentation,

where the migrants are concentrated in the secondary (“bad jobs”) market and this segment of the labour market supplies mainly unskilled labour to the non-traded goods and services sectors. This analysis reveals a number of original and counterintuitive insights that the conventional models are unable to address.

Intuitively it might be thought that the importation of relatively cheap unskilled labour would be inconsequential for an economy’s international competitiveness, where labour in the traded goods sectors is supplied mainly from the higher paid endogenous segment of the labour market. We show, using our hybrid model, how international migration can allow an economy to avoid or at least temper the rate of appreciation of its real exchange rate; forestalling the loss of internal competitiveness that the Balassa-Samuelson model predicts would normally arise from economic development and the accompanying increase in per capita income levels. This occurs not through preventing wages growth in the modern, traded goods sectors, but by preventing wages from rising faster than productivity in the *non-traded* goods sectors. The essential mechanism is through the effects of international migration on the segmented labour market and thereby on relative prices of traded to non-traded goods, rather than on unit wage costs in the traded goods sectors as would often be the assumed effect of cheap, migrant labour.

The rest of this paper is structured as follows. Section 2 discusses Lewis’ (1979) refined dual economy model with segmented labour markets in the modern sector. Section 3 examines the Balassa-Samuelson relative productivities model of real exchange rate determination with special attention to the assumptions underlying sectoral wage rate determination. Section 4 presents a critique and modification of the Balassa-Samuelson model from the perspective of a Lewisian dual economy framework with international migration and a segmented labour market. Section 5 discusses implications.

2. Segmented Labour Markets in the Lewis Dual Economy Model

In the Lewis model the evolution of a dual economy is represented by the transfer of surplus labour to a growing industrial sector (Lewis, 1954). In his original exposition of the dual economy model Lewis devotes the final ten pages to the open economy in which surplus foreign labour is also a potential source of unskilled labour. He argues that the decline in modern sector surplus associated

with the absorption of endogenous surplus labour can be avoided, or at least delayed by encouraging immigration (Lewis, 1954: 436).

In the original model it is assumed that there is a unified modern sector labour market which enjoys an unlimited supply of unskilled labour from the traditional sector, where “[e]arnings in the subsistence sector set a floor to wages in the capitalist sector, but in practice wages have to be higher than this, and there is usually a gap of 30 per cent or more between capitalist wages and subsistence earnings” (p. 150). Lewis justifies the wage gap between sectors on the grounds of cost of living differences, psychological costs of moving between sectors or prestige. Even though a wage differential is not critical to the model’s results, Lewis has been criticised for not providing a more convincing explanation for the often much greater differential between traditional sector average earnings and capitalist wages (Leeson, 1979; Basu, 1984).

In defending Lewis’ sectoral wage differential, Leeson (1979) argues the case for a segmented labour market in the modern sector; ‘a study of the segmented labour markets ... is the way to a resolution of the problem of the [wage] gap’ (p. 205). Writing on the twenty-fifth anniversary of the publication of his 1954 paper, Lewis (1979) refines the dual economy model, devoting a large part of the paper to a discussion of the workings of the modern sector labour market to explain the size of the wages gap. Adapting Marshall’s notion of “non-competing groups” Lewis conceptualizes a segmented modern sector labour market which “segments into two classes of jobs, good and bad ... (1979: 224).

Higher wages in the ‘good job’ market are attributable to ‘strict control of entry’ based on discrimination (p.225). Wages in the good job market increase with improvements in labour productivity, while in the bad job market they remain fixed; by either minimum wage laws, trade unions, or the subsistence level in the traditional sector (p.228). Because productivity rises fast in the early stages of industrialisation, wages in the primary labour market also increase rapidly, implying a widening gap between wages in the two, non-competing modern sector labour markets. There are obvious congruencies between the labour market dichotomy envisaged by Doeringer and Piore (1971) and the model of industrial segmentation presented in the dual economy literature associated with Lewis (1954; 1979). According to Doeringer and Piore, industries face varying degrees of production variability and this variability is matched in their labour markets.

By its very nature, secondary labour may cushion the impact of product market volatility; it is loosely attached to the market and can be employed temporarily in periods of excess demand and laid off indefinitely in slack periods. For example, Piore (1979) argued that it was the ‘flux and uncertainty’ of economic activity, which dichotomised the labour market and created the demand for secondary labour (p.39).

3. International Migration, Segmentation and Non-Traded Goods

Lewis (1979) describes several sources from which labour can be drawn into the secondary (ie. ‘bad jobs’) labour market at a subsistence wage: households; natural population increase; and international migration. Growth in the Lewis model occurs through the expansion of the modern or capitalist sector which, in turn, depends on the rate of capital accumulation. However, once the turning point is reached, and endogenous sources of labour are exhausted, economic growth no longer continues unrestrained. The turning point indicates the limit beyond which labour is no longer accommodating, but acts as a brake or constraint to economic growth. There are three possible reactions to the turning point – importing labour, capital exporting and capital deepening. These are discussed in some detail by Authukorala and Manning (1999) and Fields (1994).

Importing labour may appear a logical response to an undersupply of domestic unskilled labour. Indeed, in a number of Asian economies rapid economic development has been marked by the transition from a labour exporter to a labour importer as opportunities for employment are created. However, there are other options available to firms to counter a tight labour market and an associated rise in real wages. These include:

- the introduction of labour saving technology and/or enhancing labour productivity;
- relocation of labour intensive industries overseas to take advantage of lower wage costs; and/or
- sub-contracting operations overseas.

The option or combination of options available to a firm to satisfy or reduce its demand for unskilled labour will depend on numerous factors, the most important of

these include firm size and the labour intensity of production. However, also identified by Fields (1994), the option to relocate production offshore is typically only available to so-called 'footloose industries' with traded products. For firms in the non-traded goods sector, which are generally small and labour intensive producers, importing labour may be the only option to satisfy labour demand.

Labour intensive sectors, such as the non-traded sector of the economy, face disproportionately larger costs associated with an excess demand for labour, while having fewer available options to reduce their wage costs due to the nature of production and the non-tradedness of the goods and services themselves. Fong (1996) also argues this point. For this reason, the non-traded goods sector may be forced to rely more heavily on imported or foreign workers to satisfy demand for labour.

Secondary labour may also be expected to dominate the non-traded goods sector to alleviate the volatility of product demand. As Piore (1979) asserts, although migrant labour may be expected to be widespread throughout the economy, migrants will be concentrated in those sectors, which face highly variable demand and comprise a large number of unskilled jobs. This is a general description of the non-traded goods sector. It is not surprising then to find migrant labour heavily concentrated in the non-traded goods sector of the economy.

Accordingly, migrant labour can be an effective weapon in the policy armoury to contain labour costs and satisfy an economy's excess demand for unskilled labour. In some cases, immigration policy has been used deliberately as a means of containing wage pressures in the domestic economy. For instance, Singapore eased policies on the import of unskilled labour in the late 1960s, pre-empting a build-up in real wages (Fong, 1994). Sapir (1983) and Clark (1983) also suggest that in the late 1960s, the immigration policies of Western Europe may have been used to reduce labour costs in the weaker labour intensive sectors of the economy, enhancing the cost-competitiveness of these sectors internationally. Even in China, a country with an abundant supply of labour, some employers have considered the use of imported labour to reduce rising labour costs associated with strong economic growth (Kao, 1995).

However, even when immigration policy is tight, illegal workers may be employed as a means to contain costs and prices (Dallago, 1990). A tendency for labour scarce countries to refuse entry to low-skilled workers has led to the growth of

clandestine migration as firms have attempted to satisfy their labour demand (Wickramasekara 2001).

Migration may be identified as a valve, which reduces the pressure on wages associated with an exhaustion of the domestic ‘unlimited’ labour supply (that is, exhaustion of labour supply at a given wage rate) and which enables economic growth to be prolonged. By maintaining the pool of secondary labour, international migration provides the potential to postpone the Lewisian turning point indefinitely. It is only when the supply of labour to the secondary market becomes scarce through the exhaustion of the surplus labour from the traditional sector and the cessation (or prevention) of adequate supplies of immigrant unskilled labour from abroad that a single, unified labour market evolves.

Economic growth enhances standards of living and general well-being, at the same time increasing the value workers place on leisure and social status. With raised expectations, native workers will not accept menial positions such as *3D* jobs (defined previously as ‘dirty, dangerous and demanding’), which are concentrated in the non-traded goods sector or secondary labour market, without adequate compensation. The general prejudice against manual and repetitive labour also increases with education which again is associated positively with economic development. O’Connor and Farsakh (1996) have termed this the ‘problem of success’.

It is also worth noting that for Lewis also, the ‘bad jobs sector’ is dominated by service (ie. non-traded) outputs where “productivity has no meaning” (Lewis, 1979: p.227). In the context of international migration the implication is that there is a segmented labour market where migrants are engaged mainly in the ‘bad jobs sector, dominated by service outputs, while locals are drawn increasingly into the ‘good jobs sectors’ dominated by manufactured outputs.

The remaining sections of this paper examine the implications for a country’s internal competitiveness where the dual economy is also characterized by modern sector labour market segmentation, and where the ‘goods job sector’ produces mainly traded (manufactured) goods while the cheap labour from the ‘bad jobs sector’ is employed mainly in the non-traded, services sector. To explore this we incorporate Lewis’ dual economy, segmented labour market model into the Balassa-Samuelson traded/non-traded framework for analysing real exchange rate movements.

4. The Balassa-Samuelson Model

This section explores the theoretical foundations of internal competitiveness through an analysis of the underlying determinants of the relative price of non-traded goods. Relative goods prices play an integral role in the Dependent Economy model of Swan (1955;1960) and Salter (1959) and also feature in the independent contributions of Balassa (1964) and Samuelson (1964) which together form the Balassa-Samuelson model.¹ In the Dependent Economy or Swan-Salter model, the ratio has a significant role in determining internal balance by governing the direction of resource flows between the traded and non-traded goods sectors of the economy. In the Balassa-Samuelson model, movements in relative goods prices, and therefore internal competitiveness, are determined by sectoral shifts in labour productivity which underpin deviations from purchasing power parity.

Although chronologically the Swan-Salter model appears as the forerunner of the Balassa-Samuelson model, the two approaches have developed independently. Neither Balassa (1964) nor Samuelson (1964) recognise the earlier work of Swan (1955; 1960) and Salter (1959). Instead, Asea and Corden (1994) trace the contributions of Balassa and Samuelson to the expositions of Harrod (1933) and Ricardo (1911).² Reflecting their independent development, the economics literature has often failed to integrate the two models, despite their obvious similarities.

The Balassa-Samuelson model, which is established as the benchmark model for exchange rate determination, posits a link between differential labour productivity

¹ The Dependent Economy model of Swan (1955, 1960) and Salter (1959) describes how internal and external balance is attained through the adjustment of relative goods prices or changes in internal competitiveness. Recognised as the model of the Australian school (and so is often called the 'Australian model'), Arndt (1976, p.104) attributes the Dependent Economy model to Swan whom he claims established the model (as part of an 'oral tradition') well before the first publications of other proponents, such as Meade (1956), Corden (1960), Pearce (1961) and Salter (1959). Oppenheimer (1974) provides a useful summary of the genesis of this stream of literature.

² The link between relative prices (or the internal exchange rate) and differences in sectoral productivity was first established by Harrod (1933), although Viner attributes Ricardo (1911) with providing a rudimentary understanding of the relationship (Kravis, Heston and Summers 1978). Ricardo (1911) wrote, 'the prices of home commodities, and those of great bulk, though of comparatively small value, are independently of other causes higher in those countries where manufactures flourish' (p. 87). The later contributions of Samuelson (1964) and Balassa (1964) have provided the foundation on which further work has built, and for this reason, are widely regarded as fundamental to the literature. However, Samuelson (1994) claims that he was not aware of the work of Harrod until it was cited in Kravis, Heston and Summers (1978). Samuelson asserts, 'Harrod (1933, 1957) gives the best early analysis I know, one that is not bettered by 1964 Balassa-Samuelson' (1994: 207). In recognition of the contribution of Harrod to the development of the model, De Gregorio, Giovanni and Wolf (1994) have termed the relationship between relative prices and relative productivity growth the *Harrod-Samuelson-Balassa (HSB) hypothesis*. However, it has also been referred to in the literature as the *Balassa effect*, the *Balassa-Ricardo effect*, the *productivity bias hypothesis* (Asea and Mendoza 1994) and the *productivity differential model* (Hsieh 1982). For the purposes of this paper, the relationship will be referred to simply as the Balassa-Samuelson model.

and movements in the relative price form of the real exchange rate. The model developed in response to the need to understand movements in the domestic price level and to isolate the source of differences in domestic prices between countries, when expressed in a common currency.³

The basic model presented by Balassa (1964) and Samuelson (1964) is framed around an economy producing two products – traded (T) and non-traded (NT) goods, with one input to production, labour. Implicit in the model is the assumption that imports and import replacing goods are perfect substitutes. With the terms of trade assumed to be constant, exports and imports are aggregated into one Hicksian composite good referred to as traded goods (Asea and Corden, 1994).⁴

Labour is the sole input in the production of the two goods:

$$(1) \quad Q_T = a_T L_T \quad (\text{production of traded goods})$$

$$(2) \quad Q_N = a_N L_N \quad (\text{production of non-traded goods})$$

where L_T and L_N define the amounts of labour used in the production of traded and non-traded goods respectively. The coefficients on labour represent the marginal and average productivities of labour in each of the two production processes, since the production functions are linear. Assuming full employment:

$$(3) \quad L = L_T + L_N$$

Rewriting (1) and (2) in terms of (3) gives:

$$(4) \quad L = \frac{Q_T}{a_T} + \frac{Q_N}{a_N}$$

This equation in terms of Q_N becomes:

³ A full algebraic treatment of the Balassa-Samuelson model can be found in De Gregorio et al (1994) Asea and Corden (1994) and Froot and Rogoff (1996).

⁴ The composite commodity theorem can be invoked since a constant terms of trade implies that the relative price of export and imports remains constant (Nicholson 1992).

$$(5) \quad Q_N = a_N L - \left(\frac{a_N}{a_T} \right) Q_T$$

Equation (5) represents the production possibilities frontier (PPF) which defines the maximum amount of Q_N that can be produced for each unit of Q_T . The slope of the PPF defines the relative price of traded goods in terms of non-traded goods. With price set equal to marginal cost through the assumption of perfect competition, output is priced to reflect unit labour costs (nominal wages adjusted for productivity). Using traded goods as an example, equation (1) indicates that each unit of traded good output requires $1/a_T$ units of labour. At a cost of w_T per unit of labour, where w_T defines the nominal wage rate applicable in the traded goods sector, each unit of traded goods costs w/a_T . In other words, the prices of traded (P_T) and non-traded goods (P_N) are defined such that:

$$(6) \quad P_T = \frac{w_T}{a_T} \quad P_N = \frac{w_N}{a_N}$$

Alternatively, equation (6) suggests that the wage rate must equal the value of labour's productivity in both sectors. At this point, it is important to note the assumption of a uniform wage rate, which underpins orthodox open economy macroeconomics. With labour assumed to be perfectly mobile, any wage differences between sectors are competed away. An important corollary is that wage growth will tend to be uniform across both sectors.

How is the universal wage rate determined? In the small country case, goods traded internationally are those in which the 'value' of labour's productivity (for instance, $P_T A_T$) is maximised (Caves and Jones, 1985). This value sets the wage rate applying in the traded goods sector and subsequently in the non-traded goods sector of the economy through the assumption of perfect internal labour mobility. In other words, the wage rate applying in both the traded and non-traded goods sectors is determined solely by labour productivity in the traded goods sector, such that $w_T = w_N$.

Under the assumption of wage equalisation, rearranging equation (6) produces the ratio of internal goods prices which determines the slope of the production possibilities frontier:

$$(7) \quad R_r = \frac{P_N}{P_T} = \frac{a_T}{a_N}$$

Equation (7) defines the relative price of non-traded goods as the ratio of the relative rates of labour productivity in each sector. This price ratio, which is the relative domestic price form of the real exchange rate (R_r) was central to the model of Swan and Salter in terms of its role in resource allocation.

In other words, movements in the real exchange rate, and hence deviations from PPP, are determined by the differential rates of labour productivity growth across the traded and non-traded goods sectors and between economies. Hence, long-run labour productivity differentials would drive trend deviations from PPP. This is the central proposition of the Balassa-Samuelson model.

From equation (7) it also follows that:

$$(8) \quad \ln(R_p) = -\sigma \ln(R_r) + \sigma \ln(R_r^*)$$

or

$$R_p = \frac{[R_r^*]^\sigma}{[R_r]^\sigma}$$

While this relationship holds if the law of one price holds for traded goods, this discussion has also emphasised that wage equalisation between the traded and non-traded goods sectors is also a fundamental underpinning.

In fact, if the law of one price is assumed to hold, differences in labour productivity between the domestic and foreign economies are reflected in the price of non-traded goods. From (7), the prices of non-traded goods in each economy may be written as:

$$(9) \quad P_N = P_T \left(\frac{a_T}{a_N} \right) \quad EP_N^* = P_T \left(\frac{a_T^*}{a_N^*} \right)$$

In other words, the price of non-traded goods is determined by the price of traded goods and the relative productivities of labour in each sector. However, with the assumed equality of traded goods prices through the law of one price, any variation in non-traded goods prices between countries is assumed to be related directly to differences in the *relative productivities of labour*.

Rearranging (9) produces an equation for the difference in relative prices between the two economies in common currency:

$$(10) \quad \frac{P_N - EP^*_N}{P_T} = \left(\frac{a_T}{a_N} - \frac{a^*_{T^*}}{a^*_{N^*}} \right)$$

This equation implies that the domestic economy is less expensive than the foreign economy in terms of its non-traded goods prices when $(a_T/a_N) < (a^*_{T^*}/a^*_{N^*})$ and visa versa. However, this result rests on the assumption of full internal labour mobility which equalises nominal wage growth across both sectors, so that sectoral differences in productivity growth must be offset by differences in the rate of growth of prices.

Productivity improvements in the traded goods sector are transmitted to the non-traded goods sector by way of higher wages, which are then reflected in higher unit labour costs in the non-traded goods sector. Unit labour costs are unchanged in the traded goods sector since wage growth is matched by growth in labour productivity. The net effect of the rise in labour productivity in the traded goods sector is an increase in the relative price of non-traded goods, implying an appreciation of the real exchange rate. (In contrast, productivity improvements in the non-traded goods sector do not affect wages and hence produce a fall in the price of non-traded goods relative to traded goods, that is, an increase in internal competitiveness) Put simply, the Balassa-Samuelson model predicts that productivity growth in the traded goods sector should be closely linked to wages growth in both the non-traded and traded goods sectors.

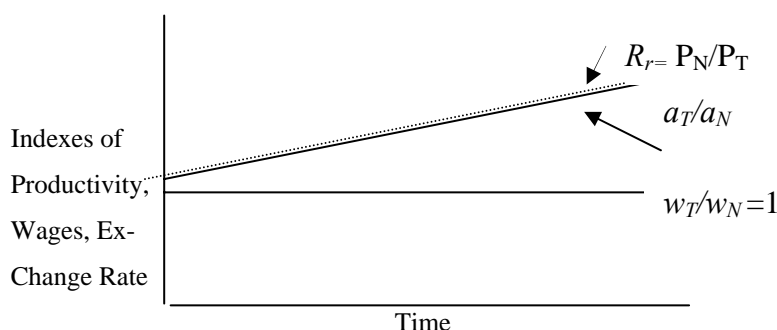
Assuming economies experience comparable rates of labour productivity in the non-traded goods sector, it follows from equation (10) that the economy with the higher rate of labour productivity growth in the traded goods sector will record a higher relative price of non-traded goods. In other words, if $a_T > a^*_{T^*}$, the relative price of non-traded goods in the domestic economy (P_N/P_T) will be higher than in the

foreign economy, assuming $a_N = a^*_N$. It also follows that the domestic economy will tend to have an appreciating exchange rate relative to the foreign economy.

Under the Balassa-Samuelson model, since the productivity bias (differential) between the traded and non-traded goods sectors is most marked for developed, high-income countries, developed countries tend to be more expensive in terms of domestic prices than developing countries. That is, a positive correlation is posited to exist between income levels or economic growth and the relative price of non-traded goods. Restated, if productivity in the traded goods sector relative to the non-traded goods sector is increasing at a faster rate at home than abroad, the domestic economy should experience a (relative) real exchange rate appreciation.

Based on this derivation of the real exchange rate, a rise in labor productivity in the traded goods sector relative to the non-traded goods sector will lead to a rise in the price of non-traded goods relative to traded goods and a fall in internal competitiveness. This scenario is depicted in Figure 1 where, with no wage differential ($w_T/w_N = 1$) the real exchange rate (R_r) moves with the growing productivity differential (a_T/a_N).

Figure 1: Relative Productivity, Wages and Prices with Unified Labor Market



This was one of Balassa's central propositions and an important inference of the Balassa-Samuelson model which, according to Masters and Ianchovichina (1998), can be 'counted among the most consistent stylised facts of the global economy'. The work of Kravis, Heston and Summers (1982)⁵ for the United Nations International Comparison Project (ICP) is cited frequently as empirical support for the

⁵ Also see, Heston, Nuxoll and Summers (1994).

Balassa-Samuelson model.⁶ Kravis et al. found that ‘services are much cheaper in the relative price structure of a typical poor country than in that of a rich country’ (p. 8). Their conclusion derived from econometric work based on twenty countries, which revealed an inverse relationship between real per capita GDP and the ratio of service sector [non-traded goods sector] productivity to commodity sector [traded goods sector] productivity.⁷ However, Clark (1957) came to a similar conclusion many years earlier, observing ‘a general tendency for several services to be relatively cheaper in less economically developed countries or periods’ (p.384).

The exchange rate record of most developed countries over the 1980s can be explained in terms of the Balassa-Samuelson model. Those countries, such as Japan and South Korea, which experienced the strongest growth in relative prices or real exchange rate appreciation, also recorded the highest rates of growth in labour productivity in the traded goods sector (Dwyer and Lowe, 1992). This empirical observation can be explained simply in terms of the relationship between the traded and non-traded sector of the economy implicit in the Balassa-Samuelson model and described in the Swan-Salter model.

An improvement in labour productivity in the traded goods sector increases the demand for labour in that sector. With labour mobility, this puts upward pressure on wages in all sectors of the economy. With increased income generated by productivity improvements, demand for traded and non-traded goods rises. To maintain internal balance, production of non-traded goods must rise. While an increase in demand for traded goods can be satisfied by imports, increased demand for non-traded goods can only be met through higher domestic production. To maintain internal balance, production of non-traded goods must increase. This can only be achieved by shifting resources to the non-traded goods sector (Sachs and Larrain, 1993).

Internal equilibrium is re-established in the market through an increase in non-traded goods prices relative to traded goods prices, that is, an appreciation of the real exchange rate. Therefore, as posited by Swan (1955; 1960) and Salter (1959), the change in relative prices has allocated resources away from the traded goods sector to the non-traded goods sector. In other words, an improvement in productivity in the

⁶ Later work, such as that by Falvey and Gemmell (1991) has found services (non-traded goods) prices are not only directly related to a country’s income levels but endowments of agricultural land, minerals, and capital, and the size of trade deficits.

⁷ Bhagwati (1984) reviews and extends the work of Kravis, Heston and Summers (1982).

traded goods sector relative to the non-traded goods sector is associated with a loss of internal competitiveness.

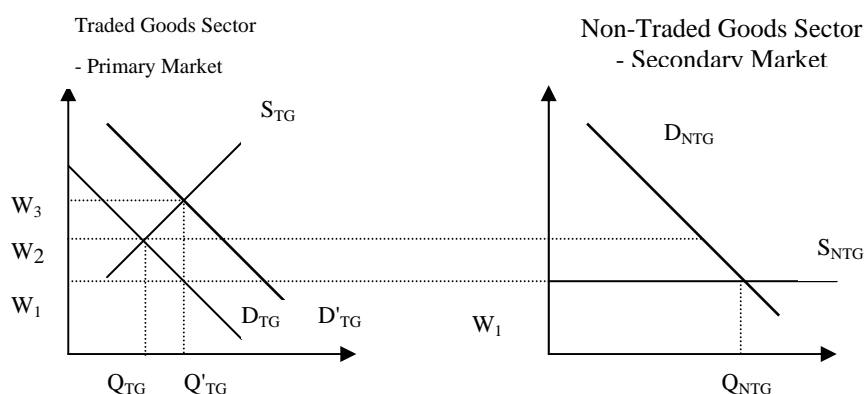
5. Modifying Balassa-Samuelson for Segmented Labour Markets

A key premise of the Balassa-Samuelson model is wage equalisation between the non-traded and traded goods sectors of the economy. This premise rests on the assumptions of labour mobility and the operation of a perfectly competitive labour market. Inter-sectoral labour mobility is critical to the model's postulate that productivity growth in the traded goods sector drives wages growth in the non-traded goods sector, such that movements in the real exchange rate (and by implication, internal competitiveness) are driven by intersectoral differences in the rate of labour productivity growth. In simple terms, the assumption of perfect internal labour mobility provides no role for wages growth in the determination of the real exchange rate or internal competitiveness.

This section analyses the impact on the Balassa-Samuelson model of limited labour mobility between the traded and non-traded goods sectors by adopting a segmented labour market framework. In this framework it is assumed that the traded and non-traded goods sectors exhibit the characteristics of a primary and secondary labour market respectively.

Returning to the analysis of labour demand and supply, Figure 2 highlights the implications of limited labour mobility for the wage-productivity relationship which underpins the Balassa-Samuelson model. The following example assumes a segmented market for labour where the primary labour and secondary labour markets are posited to operate in the traded and non-traded goods sectors respectively.

Figure 2: Labour Immobility in the Balassa-Samuelson Model



Assume a segmented labour market operates such that wages in the traded goods sector are higher than in the non-traded goods sector. As shown in Figure 2, the wage differential is equivalent to $(W_2 - W_1)$. Wages are determined independently in each sector. The labour supply curve in the non-traded goods sector is horizontal at an assumed minimum or subsistence due to an unlimited supply of labour, along the lines of a Lewisian model (Lewis, 1954). Since the labour market is segmented and labour mobility is limited, the wage differential persists. Next assume that labour productivity increases in the traded goods sector as demonstrated by an outward shift in the labour demand curve to D'_{TG} . The result is an increase in wages in the primary labour market or traded goods sector to W_3 , which widens the wage differential to $(W_3 - W_1)$. If the labour market was competitive and labour freely mobile between sectors, the wage differential would cause labour to flow into the traded goods sector, depressing the wage until wages were again equalized between sectors. However, in a segmented labour market, the wage differential $(W_3 - W_1)$ between the two sectors or markets persists due to limited labour mobility.

As this case highlights, rising labour productivity in the traded goods sector is not transmitted to the non-traded goods sector, in the form of higher wages, due to labour immobility associated with labour market segmentation. Instead, rising labour productivity in the traded goods sector will be associated with a widening wage differential with the non-traded goods sector. Moreover, the effect of labour immobility is to effectively seal off the non-traded goods sector, along the lines considered by Baumol (1967), such that unit labour costs do not rise in line with productivity growth in the traded goods sector.

We can demonstrate the effect of a segmented market for labour on the relative price of non-traded goods by incorporating a intersectoral wage differential within the Balassa-Samuelson model. It will be shown that relaxing the Classical assumption of a uniform wage has significant ramifications for the central thrust of the Balassa-Samuelson model that the real exchange rate or relative price of non-traded goods, is determined exclusively by the relative productivities of labour in each sector (assuming still that labour is the only input into production). However, more importantly, is the need to assess the implications of the breakdown in this relationship on the determination of the real exchange rate and internal competitiveness.

From equation (7) equations (11) and (12) define the relative price of non-traded goods under the competitive and segmented labour market assumptions:

(11) *Competitive Labour Market*

$$\frac{P_{NT}}{P_T} = \frac{a_T}{a_{NT}}$$

(12) *Segmented Labour Market*

$$\frac{P_{NT}}{P_T} = \frac{w_{NT} a_T}{w_T a_{NT}}$$

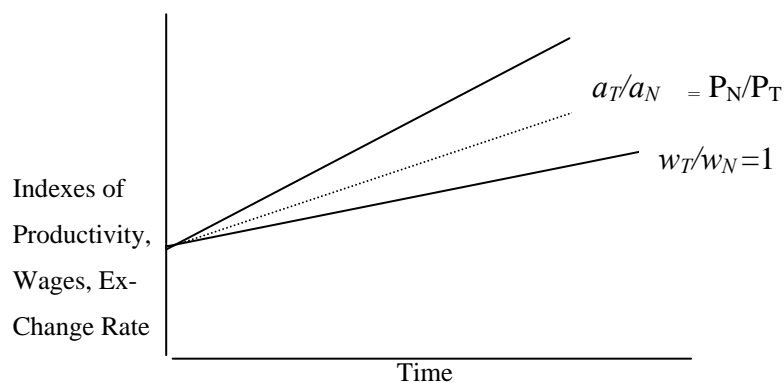
where: p etc etc and w_{NT} and w_T denote nominal wages in the non-traded and traded goods sectors respectively. By relaxing the Balassa-Samuelson assumption of wage equalisation between sectors, the relative price of non-traded goods becomes a function of both the relative productivities of labour in each sector and the relative wage, since:

$$(13) \quad P_T = \frac{w_T}{a_T} \quad P_{NT} = \frac{w_{NT}}{a_{NT}}$$

In other words, changes in internal competitiveness, as measured by the relative price of non-traded goods, are dampened or moderated by the operation of a dual or segmented labor market in which wages across the economy are not uniform.

This scenario is depicted in Figure 3 where W_t/W_n now has a positive slope resulting in the slope of R_r becoming less than the slope of A_t/A_n .

Figure 3: Relative Productivity, Wages and Prices with Dual Labor Markets



Converting the relative price relationships in equations (11) and (12) to log growth terms indicates the effect of a segmented market for labour on *growth* in the real exchange rate.

(14) *Competitive Labour Market*

$$\dot{R}_r = \left(\dot{a}_T - \dot{a}_{NT} \right)$$

(15) *Segmented Labour Market*

$$\dot{R}_r = \left(\dot{w}_{NT} - \dot{a}_{NT} \right) + \left(\dot{a}_T - \dot{w}_T \right) = \left(\dot{w}_{NT} - \dot{w}_T \right) + \left(\dot{a}_T - \dot{a}_{NT} \right)$$

In an integrated or competitive market for labour, depicted by equation (14), where labour mobility maintains a uniform rate of wage growth across sectors, growth in the real exchange rate is directly related to the differential growth in labour productivity between sectors, since the differential in wage growth equates to zero. According to the Balassa-Samuelson model captured in equation (14), the real exchange rate appreciates, under the assumption of mobile labour, whenever growth in labour productivity in the traded goods sector exceeds productivity growth in the non-traded goods sector. Conversely, the real exchange rate depreciates whenever growth in labour productivity in the non-traded goods sector exceeds labour productivity growth in the traded goods sector.

However, in a segmented labour market, uniform wage growth does not apply, as labour is not free to move between sectors to equilibrate movements in wages. Under this labour market assumption, growth in the real exchange rate is dependent upon growth in the differential in wages and labour productivity in each sector. Accordingly, in a segmented market for labour, movement in the real exchange rate may be disconnected from differential productivity growth, depending on the significance of the intersectoral wage differential. An important corollary is that

fluctuations in the relative price of non-traded goods or the real exchange rate will be muted to the extent that wages and productivity growth are linked in each sector.

Accordingly, the Balassa-Samuelson model could ignore an important determinant of the relative price of non-traded goods and internal competitiveness, namely differential wage growth, if wage equalisation between the traded and non-traded goods sectors does not hold and the labour market is better approximated by a segmented labour market.

However, more important, is the implication of a segmented labour market for the real exchange rate in the presence of a productivity bias – that is, a persistent differential in the rate of productivity growth in the traded goods sector over the non-traded goods sector. In the conventional model, this bias is expected to result in a steady appreciation of the real exchange rate or rise in the relative price of traded goods relative to non-traded goods implying a loss of internal competitiveness.

However, if the non-traded goods sector is shut off from the traded goods sector, through a segmented market for labour, such that productivity growth in the traded goods sector only translates to higher wages growth in that sector, a productivity bias does not necessarily lead to an appreciation of the exchange rate and loss of internal competitiveness. Accordingly, a segmented market for labour seriously challenges the key postulates of the Balassa-Samuelson model.

A related implication is that economies which have a segmented market for labour, are not likely to experience the same exchange rate pressures, as economies with perfectly competitive labour markets, in response strong labour productivity growth in the traded goods sector.

Moreover, it is through a segmented labour market, where flows of unskilled foreign workers provide an important source of secondary labour to the non-traded goods sector, that migration has significant and direct implications for internal competitiveness. As was discussed in the context of the Lewis model in Section 3, unskilled labour migration removes the endogenous labour supply as a constraint thereby reducing the development of wage pressures in the secondary labour market. Accordingly, where the product and labour market dichotomies are congruent as proposed in the dual economy literature, such that secondary labour is channelled to the non-traded goods sector, migration may operate to maintain internal competitiveness, despite the existence of a productivity bias, by restraining wage

growth in the non-traded goods sector. As identified in the Lewis model, this situation will persist while there is access to secondary labour through migration.

To accommodate weak labour mobility characteristic of a segmented labour market, requires the re-specification of the Balassa-Samuelson model to acknowledge intersectoral wage differentials as a possible factor in the determination of the real exchange rate.

Following from equation (15), a modified Balassa-Samuelson model is shown below depicting the relationship between growth in relative wages, labour productivity and prices:

$$(16) \quad \Delta \ln R_r = \Delta \ln \left(\frac{P_{NT}}{P_T} \right) = \beta_0 + \beta_1 \Delta \ln \left(\frac{a_T}{a_{NT}} \right) + \beta_2 \Delta \ln \left(\frac{w_{NT}}{w_T} \right) + u$$

where u is the residual of the regression and Δ represents the rate of change in the relevant variable.

Equation (16) estimates the rate of change in the relative price of non-traded goods prices or the relative price form of the real exchange rate. In equation (16), the rate of change or growth in the real exchange rate is regressed on a constant term and the rate of growth in the ratio of labour productivity between the traded and non-traded goods sectors. To accommodate the relaxation of the assumption of uniform wages and labour mobility, the rate of change in relative wages is also included. Based on *a priori* expectations we expect β_0 to be zero and β_1 and β_2 to be greater than zero. That is, an increase in non-traded goods sector wages growth relative to that in the traded goods sector is associated with an increase in the relative price of non-traded goods or a real exchange rate appreciation. Similarly, an increase in productivity growth in the traded goods sector relative to that in the non-traded goods sector is expected to be associated with a rise in relative prices or an appreciation of the real exchange rate.

6. Summary

Globalisation has witnessed a substantial increase in the international flows of largely unskilled labour into the rapidly growing tiger economies of Asia where rapid industrialisation and spectacular growth rates led to shortages in the supply of labour

from domestic sources. This paper addressed, from a theoretical standpoint, the possible implications for internal competitiveness of a country's increased reliance on low-wage, migrant labour.

It was noted that much of the migrant labour force in Asia is concentrated in the non-tradeable sectors such as construction and services – the so-called 3-D jobs that the national labour force are least inclined to take on. We then describe a segmentation of the labour market where the lower-paid, 'bad jobs' segment dominated by migrants is specific to the non-tradeable goods and services sectors, while the better-paid, 'good jobs' are held mainly by nationals and are concentrated in the tradeables sectors. Clearly, in such circumstances, where wages in the two segments are determined independently of one another, the inflow of migrant labour would have little *direct* influence on the unit wage costs of tradeable goods, unless there are sizeable non-tradeable inputs into the production of tradeables.

Extending and adapting the Balassa-Samuelson relative productivities model of real exchange rate determination to allow for such labour market segmentation allows us to examine the *indirect* effects of labour migration on internal competitiveness, as determined by the relative price of non-tradeables to tradeables. It was shown that if we further assume that wages in the non-tradeable ('bad jobs') sectors are prevented from rising given the unlimited supply of migrant labour, and therefore wage growth is kept in check with this sector's lower productivity growth, while wages in the tradeable sectors rise with productivity gains in these sectors, the relative price and therefore competitiveness of tradeable goods will not decline. This is contrary to the prediction of the Balassa-Samuelson model which assumes a unified labour market with one equilibrium wage rate across all sectors, with productivity rising faster in the tradeables than in the non-tradeables sectors. In other words, international migration enhances a country's competitiveness in international trade not directly through the use of sweatshop labour to lower the unit labour costs of tradeable goods, but rather, indirectly by forestalling the inevitable appreciation of the real exchange rate that, according to the Balassa-Samuelson model, would inevitably accompany economic development with rising real wages and per capita income levels. What remains is for this alternative model to be tested empirically comparing real exchange rate movements in rapidly growing economies, with and without the inflow of a significant labour force.

References

- Arndt, H.W. (1976) 'Non-Traded Goods and the Balance of Payments: The Australian Contribution', *The Economic Record*, 52, pp. 104-107.
- Asea, P.K. and Corden, W.M. (1994) 'The Balassa-Samuelson Model: An Overview', *Review of International Economics*, 2(3), pp. 191-200.
- Asea, P.K. and Mendoza, E.G. (1994) 'The Balassa-Samuelson Model: A General Equilibrium Appraisal', *Review of International Economics*, 2(3), pp. 244-267.
- Athukorala, P. and Manning, C. (1999) *Structural Change and International Migration in East Asia: Adjusting to Labour Scarcity*. Oxford University Press: Oxford.
- Balassa, B. (1964) 'The Purchasing Power Parity Doctrine: A Reappraisal', *Journal of Political Economy*, 72, pp. 584-596.
- Basu, K. (1984) *The Less Developed Economy - A Critique of Contemporary Theory*. Basil Blackwell: New York.
- Baumol, W.J. (1967) 'Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis', *American Economic Review*, 57(3), pp. 415-426.
- Bhagwati, J. (1984) 'Splintering and Disembodiment of Services and Developing Countries', *The World Economy*, 7(2), 133-44.
- Caves, R.E. and Jones, R.W. (1985) *World Trade and Payments: An Introduction*, 4th edition. Little Brown and Company: Boston.
- Clark, C. (1957) *The Conditions of Economic Progress*, 3rd edition. Macmillan: London.
- Clark, M.G. (1983) 'The Swiss Experience with Foreign Workers: Lessons for the United States', *Industrial and Labor Relations Review*, 36(4), pp. 606-623.
- Corden, W.M. (1960) 'The Geometric Representation of Policies to Attain Internal and External Balance', *Review of Economic Studies*, 28(1), pp. 1-22.
- Corden, W.M. (1994) *Economic Policy, Exchange Rates and the International System*. Oxford University Press: Oxford.
- Dallago, B. (1990) *The Irregular Economy*. Aldershot: Dartmouth.
- De Gregorio, J., Giovanni, A., and Wolf, H.C. (1994) 'International Evidence on Tradables and Nontradables Inflation', *European Economic Review*, 38, pp. 1225-1244.
- Doeringer, P. and Piore, M. (1971) *Internal Labour Markets and Manpower Analysis*. Lexington Books: Lexington.

- Dwyer, J. and Lowe, P. (1993) 'Alternative Concepts of the Real Exchange Rate: A Reconciliation', *Reserve Bank of Australia Discussion Paper*, no. 9309.
- Falvey, R.E. and Gemmell, N. (1991) 'Explaining Service-Price Differences in International Comparisons', *American Economic Review*, 81(4), pp.1295-1309.
- Fields, G.S. (1994) 'The Migration Transition in Asia', *Asian Pacific Migration Journal*, 3(1), pp. 7-30.
- Fong, P.E. (1994) 'An Eclectic Approach to Turning Points in Migration', *Asian and Pacific Migration Journal*, 3(1), pp. 81-91.
- Fong, P.E. (1996) 'Malaysia and Chinese Taipei: Labour Market Experiences Compared', in O'Connor, D. and Farsakh, L. (eds) *Development Strategy, Employment and Migration*. OECD:Paris.
- Froot, K.A. and Rogoff, K. (1996) 'Perspectives on PPP and Long-Run Real Exchange Rates', in Grossman, G. and Rogoff, K. (eds) *Handbook of International Economics*, 3. Elsevier Science B.V: Amsterdam.
- Harrod, R.F. (1933) *International Economics*. Cambridge University Press: Cambridge.
- Heston, A., Nuxoll, D.A. and Summers, R. (1994) 'The Differential-Productivity Hypothesis and Purchasing-Power Parities: Some New Evidence', *Review of International Economics*, 2(3), pp. 227-243.
- Hsieh, D.A (1982) 'The Determination of the Real Exchange Rate', *Journal of International Economics*, 12, pp. 355-362.
- Kao, Y. C. (1995) 'Adjusting to Internationalisation and Liberalisation: Labour Market Dynamic of the Republic of China', *Industry of Free China*, 84(2), pp. 69-94.
- Kravis, I., Heston, A. and Summers, R. (1978) 'Real GDP per Capita for More than One Hundred Countries', *The Economic Journal*, 88, pp. 215-242.
- Kravis, I., Heston, A. and Summers, R. (1982) 'The Share of Services in Economic Growth' (mimeograph), in Adams, F.G. and Hickman, B. (eds) *Global Econometrics: Essays in Honor of Lawrence R. Klein*. MIT Press: Cambridge.
- Leeson, P.F. (1979) 'The Lewis Model and Development Theory', *The Manchester School*, 47(3), pp. 196-210.
- Lewis, W.A. (1954) 'Economic Development with Unlimited Supplies of Labour', *The Manchester School*, 28 (2): 139-191.
- Lewis, W.A. (1979) 'The Dual Economy Revisited', *The Manchester School*, 47(3), pp. 211-229.
- Meade, J.E. (1956) 'The Price Mechanism and the Australian Balance of Payments', *The Economic Record*, November, pp. 239-56.

- Masters, W.A and Ianhovichina, E. (1998) Measuring Exchange Rate Misalignment: Inflation Differentials and Domestic Relative Prices, *World Development*, 26(3), pp. 465-477.
- Nicholson, W. (1992) *Microeconomic Theory: Basic Principles and Extensions*, 5th edition. Harcourt Brace Jovanovich: Orlando.
- O'Connor, D. and Farsakh, L. (eds) (1996) *Development Strategy, Employment and Migration*. OECD: Paris.
- OECD (2003) *Trends in International Migration*, Annual Report 2002 Edition. OECD: Paris.
- Oppenheimer, P. M. (1974) 'Non-Traded Goods and the Balance of Payments', *Journal of Economic Literature*, 12(3), pp.882-888.
- Pearce, I.F. (1961) 'The Problem of the Balance of Payments', *International Economic Review*, 2(1), pp. 1-28.
- Piore, M.J. (1979) *Birds of Passage: Migrant Labor and Industrial Societies*. Cambridge University Press: London.
- Ricardo, D. (1911) *The Principles of Economy and Taxation*. J.M Dent: London.
- Sachs and Larrain (1993) *Macroeconomics in the Global Economy*. Harvester Wheatsheaf: New York.
- Salter, W.E. (1959) 'Internal and External Balance: The Role of Price and Expenditure Effects', *The Economic Record*, 35, pp. 226-238.
- Samuelson, P.A. (1964) 'Theoretical Notes on Trade Problems', *The Review of Economics and Statistics*, 46, pp. 145-54.
- Samuelson, P.A. (1994) 'Facets of Balassa-Samuelson Thirty Years Later', *Review of International Economics*, 2(3), pp. 201-226.
- Sapir, A. (1983) 'Foreign Competition, Immigration and Structural Adjustment', *Journal of International Economics*, 14, pp. 381-394.
- Swan, T.W. (1955) 'Longer run problems of the balance of payments', in Arndt, H.W. and Corden, W.M. (eds) *The Australian Economy: a Volume of Readings*. Cheshire: Melbourne.
- Swan, T.W. (1960) 'Economic Control in a Dependent Economy', *The Economic Record*, 36(73), pp. 51-66.
- Wickramasekara, P. (2001) 'Labour Migration in Asia: Issues and Challenges', in OECD (ed) *International Migration in Asia – Trends and Policies*. OECD: Paris.