trade and child labour. Many are concerned that, because less developed countries are assumed to specialize in exports of low-skill products, high-income countries foster child labour in low-income countries by raising the demand for the products intensive in unskilled labour. In fact, as discussed in Edmonds and Pavcnik (2005a), the link between trade and child labour is far more complicated and depends on how trade affects family incomes and poverty, the availability of substitutes or complements for the child's work, the returns to education, and consumption prices in addition to how trade affects the demand for child labour. Empirically, the association between trade and living standards seems to be the dominant factor in how trade affects child labour. Cross-country evidence in Edmonds and Pavcnik (2006) provides no support for the claim that trade perpetuates high levels of child labour in poor countries via the demand channel. Similarly, Edmonds and Pavcnik (2005b) show that child labour declined in Vietnam following the rice market liberalization that relaxed rice export quota and improved the standard of living of many net-rice producing households, even though the employment opportunities in the rice sector increased. There are many reasons for a connection between child labour and family incomes or poverty. Ranjan (2001) in particular emphasizes the relaxation of credit constraints as important for understanding why growing trade might be associated with declining child labour despite rising demand for unskilled labour. In this vein, Edmonds, Pavcnik, and Topalova (2007) argue that, in the Indian context, the child's economic contribution to the household through the avoidance of schooling costs is important in understanding the interconnections among trade policy changes, child labour, and schooling.

NINA PAVCNIK

See also **child labour; Heckscher–Ohlin trade theory; inequality (measurement); poverty; poverty alleviation programmes; trade costs.**

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trade costs

'Trade costs' refer to the costs above and beyond the 'mill price' that the final consumer of a good (or service) pays. If a product is sold by producer i to consumer j at (mill) price p_i (in dollars), the consumer pays $p_i + T_{ij}$, where T_{ij} denotes the 'trade costs' (also in dollars). Such costs may cover the opportunity costs of resources, but some trade costs are just rent seeking barriers. International trade provides a fertile ground for studying various types of and economic effects of trade costs. International trade flows travel across large distances and empirical estimates of the costs of transporting goods between two economic centres are available. However, such flows also face less obvious trade costs. A broad interpretation of trade costs includes – beyond transport costs – information-gathering costs for a consumer to locate a foreign producer, financial and legal costs of negotiating contracts, policy-related barriers,

and costs of final distribution in the importing country. As discussed in Anderson and van Wincoop (2004), the total trade costs associated with exporting a good from producer *i* to consumer *j* may be an average *ad valorem* add on of 170 per cent to the (mill) price of a good. In this article, we discuss some of the different types of international trade costs (subsets of which form national and local trade costs), and how such costs can influence the volume of trade between two nations and the relative prices of nations' goods.

Except for economic size, trade costs are probably the most important factor determining the volume of trade between a pair of countries (see Anderson, 1979; Bergstrand, 1985; and Anderson and van Wincoop, 2003). Trade costs play a critical role in understanding outsourcing, the factor content of trade, the field of economic geography, foreign direct investment and foreign affiliate sales of multinational enterprises, and the proliferation of regional trade agreements in the post-war period. Obstfeld and Rogoff (2000) argue that trade costs in goods markets provide the critical common element that also explains at least *six major puzzles* in international macroeconomics.

The trade cost that comes immediately to mind is the cost of transporting a good from producer *i* to consumer *j*. EXW ('ex works') refers to the price of a good at the point of origin; mill price is a synonym for the ex works price ('mill' refers to where the good was produced). FOB ('free on board') refers to the price of a good delivered to and put 'on board' an overseas vessel. CIF ('cost, insurance, freight') refers to the price of a good to a named overseas port, including insurance costs. Empirical researchers have used both FOB export data and CIF import data but prefer the latter because import data measured at customs points is more accurate.

A common measure of international transport costs is consequently the difference between the CIF and FOB values of a trade flow. The International Monetary Fund (IMF) provides data on average 'CIF/FOB factors' [100 × (CIF value–FOB value)/FOB value] for countries. Baier and Bergstrand (2001) report that average CIF/FOB factors for 16 Organisation for Economic Co-operation and Development (OECD) countries in 1958 and 1988 were 8.2 per cent and 4.3 per cent, respectively. David Hummels (2001) finds that freight rates vary dramatically across countries with average transport costs ranging from 3.8 per cent of EXW price p_i for the United States to 13.3 per cent for land-locked Paraguay in 1994, varying even more across commodities within countries. Hummels (1999) finds evidence that inflation-adjusted tramp shipping rates have declined between 40 and 70 per cent from 1950 to 1995, but also finds evidence suggesting ocean shipping rates have not declined. It is common to express transport costs on an *ad valorem* (or rate) basis. Hence, the price faced by consumer *j* for producer *i*'s product, p_{ij}, can be expressed as $p_{ij} = p_i\ (1+tc_{ij})$ where tc_{ij} is the (CIF – FOB)/FOB factor (for example, 0.04).

Another important trade cost is that associated with policy-related barriers imposed by national (or perhaps sub-national) governments. The trade cost most often envisioned here is a 'tariff', a tax imposed at customs points on imported goods. *Specific* tariffs are expressed in an amount of the home currency per unit imported good; T_{ij} used earlier denoted a specific trade cost. *Ad valorem* tariffs are expressed as a fraction of the value of the good; hence, an *ad valorem* tariff of ta_{ij} would cause the imported price of producer *i*'s product for consumer *j* to be $p_{ij} = p_i\ (1 + ta_{ij})$ when the tariff is imposed on the FOB value and $p_{ij} = p_i\ (1 + tc_{ij})(1 + ta_{ij})$ when the tariff is imposed on the CIF value. Other entries in this dictionary address tariffs in more detail.

Transport costs and tariff barriers are arguably the easiest trade costs to measure *directly*. Because of difficulty in measuring other types of trade costs directly, empirical economists have turned to *indirect* methods to estimate trade costs. Indirect methods fall into two basic categories: inferring trade costs from differences in trade volumes between pairs of countries and inferring trade costs from differences in prices between pairs of countries.

International trade economists have long used and increasingly applied the 'gravity equation' to explain empirically international trade flows (see Feenstra, 2004, ch. 5; GRAVITY EQUATION). The gravity equation typically explains bilateral trade flows between country pairs using cross-sectional or panel data on pairs' gross domestic products (GDPs), bilateral distances between country pairs' economic centres, and several other variables representing bilateral trade costs to infer the effects of such costs on members' trade. Distance has long been a central variable explaining trade volumes, and typically has been interpreted as a measure of transport costs. However, the effect of distance probably measures more than transport costs, such as information costs. For instance, empirical work explaining bilateral foreign direct investment (FDI) flows also finds that distance has an economically significant effect on deterring such flows, even though theory suggests that measures of trade costs and FDI costs should have opposite effects on each others' flows (see Markusen, 2002). Portes and Rey (2005) find empirically that distance also has a significant negative effect on portfolio flows, for which the transaction cost should be minimal.

Other sources of trade costs (which consume resources) include infrastructure, communication and foreign exchange costs. Limao and Venables (2001) find that infrastructure has a significant effect on trade volumes, with a decline in the level of infrastructure investment from the median level to the 75th percentile equivalent to a 2,166-mile (3,466-km) increase in sea distance travelled. Tang (2006), using various measures of information technology, finds that communication costs have a significant effect on the volume of trade. Economists have long thought that exchange rate variability

and its associated uncertainty should impose a significant trade cost and deterrent to trade. However, a survey of studies reveals that the trade-volume effects are probably small (see Cote, 1994).

With the use of the gravity equation in international trade, indirect estimates of the trade costs associated with national trade policies have proliferated. While a few empirical studies have looked at the effects of tariff rates explicitly on trade flows, the vast bulk have measured the presence or absence of (typically regional) economic integration agreements and currency unions on trade between country pairs. Many earlier studies using standard gravity equations found surprisingly small estimated effects on trade of arguably important trade agreements such as the Treaty of Rome (see Frankel, 1997). However, more recent studies incorporating modern theoretical foundations for the gravity equation and econometric techniques suggest that such small estimates are probably due to a bias introduced by self-selection of countries into such agreements (see Baier and Bergstrand, 2004; 2007). By contrast, work by Rose (2000) indicates that a currency union may have a very strong impact on trade between country pairs.

Estimates of trade costs have also been inferred indirectly using discrepancies in prices between countries. Engel and Rogers (1996) demonstrated that price variability of similar goods between US and Canadian cities is much greater than that between equidistant cities in the same country. Engel and Rogers (2001) showed that a 'real barriers' effect owing to incomplete market integration is present, but also that some dispersion could be explained by exchange rate variability and sticky price behaviour. Parsley and Wei (2001) showed that distance, unit-shipping costs, and exchange rate variability all contribute to dispersion of relative tradable goods prices across 96 cities in Japan and the United States. However, Crucini, Telmer and Zachariadis (2005) used price data from European cities to show that goods markets – at least, those in Europe – may be much more integrated than earlier work showed.

JEFFREY H. BERGSTRAND

See also **currency unions; factor content of trade; foreign direct investment; gravity equation; international outsourcing; regional and preferential trade agreements.**

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trade cycle

The dynamics of capitalist economies are characterized by two facts: sustained growth of production and employment and wide oscillations of these magnitudes and the level of prices as well. This oscillatory behaviour