

Simplest case:

One good, X

Two factors of production, L and K

Two countries, h and f.

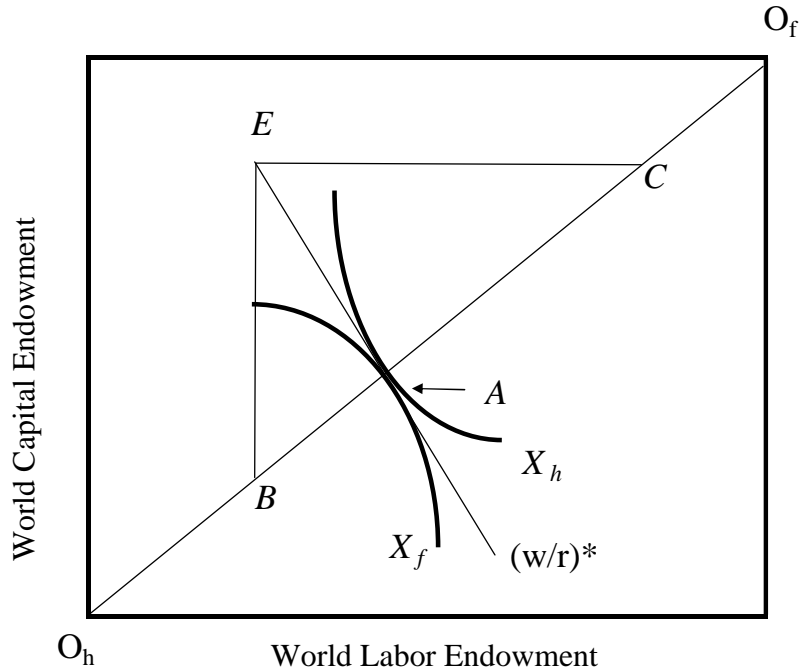
Figure 15.1

World Edgeworth Box.

Total dimensions are the total world endowments of labor and capital.

Any point in the box is a division of the world endowment between country h and country f.

Figure 15.1 Equivalence of alternative types of trade



Country h is measured from the Southwest corner and country f from the Northeast corner.

E is the endowment point (h is capital abundant and f is labor abundant).

Trade is to a final equilibrium at point A, the consumption point.

Consider the trade from E to A. Three ways to do this.

1. h exports capital, imports labor (E directly to A)
2. h exports capital (E to B), imports X (B to A).
3. h imports labor (E to C), exports X (C to A).

All three are equivalent in welfare terms. Wage rate and return to capital are the same. Stolper-Samuelson theorem valid.

3

Implications for the trade account.

Merchandise account: balance of trade in X only.

Current account: balance of trade in X and in factor services.

Option 1: No trade in goods, merchandise account balances

Option 2: Deficit in the merchandise account. Home exports services, imports goods.

Option 3: Surplus in the merchandise account. Home imports labor services, exports goods. The latter is “emigrants remittances from foreign’s point of view.

Complications:

Exports of capital (option 2):

home-country critics don't like the fact that firms are exporting jobs.

home-country worries about loss of tax revenue

host countries worry about the loss of sovereignty to foreign firms.

Imports of labor (option 3)

Congestion effects. In fact there is at least one additional factor, land.

Importing people creates effects not present with the other two.

Immigrants also demand public services, etc. Low wage / low skill immigrants cost more in public services than they contribute in taxes.

This latter effects sets up a fiscal externality. Firms want low wage immigrants, but local and state governments want to keep them out.

Gains from trade theorem

Let X_i denote production of good i and D_i denote consumption of good i . V_j will denote the *use* of factor j in production

\bar{V}_j will denote the *endowment* of factor j . V_j and \bar{V}_j can now differ due to imports or exports of factor i .

$V_j > \bar{V}_j$, for example, means that the country is an importer of factor j . p_i denote goods prices and w_j is the price of factor j .

Superscript $*$ denotes free trade while superscript ' a ' denotes autarky.

$$\sum_i p_i^* X_i^* - \sum_i \sum_j w_j^* V_{ij}^* \geq \sum_i p_i^* X_i^a - \sum_i \sum_j w_j^* V_{ij}^a \quad (15.1)$$

The sum of factor use on the left-hand side gives the total value of factor payments for factors used in the free-trade equilibrium.

$$\sum_i \sum_j w_j^* V_{ij}^* = \sum_j w_j^* V_j^* \quad (15.2)$$

The sum of factor use on the right-hand side is the value of the country's factor endowment (since no factors are trade) at free-trade prices.

$$\sum_i \sum_j w_j^* V_{ij}^a = \sum_j w_j^* \bar{V}_j \quad (15.3)$$

Substituting (15.2) and (15.3) into (15.1), the latter can be written as

$$\sum_i p_i^* X_i^* - \sum_j w_j^* V_j^* \geq \sum_i p_i^* X_i^a - \sum_j w_j^* \bar{V}_j \quad (15.4)$$

This can be re-arranged to yield

$$\sum_i p_i^* X_i^* + \sum_j \left[w_j^* \bar{V}_j - w_j^* V_j^* \right] \geq \sum_i p_i^* X_i^a \quad (15.5)$$

The trade balance condition: the sum of the value of exports over all goods i plus the sum of the value of factor exports (the difference between each factor's endowment and use) over all factors j must equal zero

$$\sum_i \left[p_i^* X_i^* - p_i^* D_i^* \right] + \sum_j \left[w_j^* \bar{V}_j - w_j^* V_j^* \right] = 0 \quad (15.6)$$

This can be rearranged to yield

$$\sum_i p_i^* X_i^* + \sum_j \left[w_j^* \bar{V}_j - w_j^* V_j^* \right] = \sum_i p_i^* D_i^* \quad (15.7)$$

Autarky market clearing condition is that the supply and demand of each good are equal.

$$X_i^a = D_i^a \quad (15.8)$$

Substitute (15.7) for the left-hand side of (15.5) and substitute (15.8) for the right-hand side of (15.5). The latter then becomes

$$\sum_i p_i^* D_i^* \geq \sum_i p_i^* D_i^a \quad (15.9)$$

Free trade consumption is revealed preferred to autarky consumption, which was to be proved. Free trade in goods and factors in a competitive, undistorted economy must be better than autarky.

Heckscher-Ohlin Model

1. Factor prices are equalized by trade and there is no reason to add factor trade to commodity trade.
2. Countries are sufficiently different such that they are specialized in trade: then each country has a relatively high price for its scarce factor, the factor used intensively in its import competing industry.

Figure 15.2

Figure 15.3

Allowing factors to move implies that relative factor endowment differences will be reduced and in general trade will be reduced.

Figure 15.2: Specialization and Relative Factor Prices

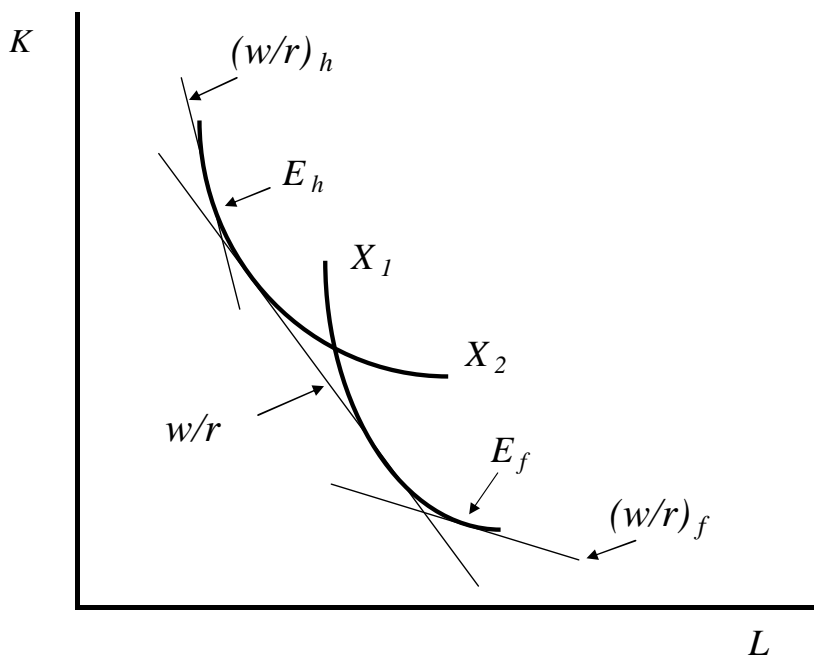
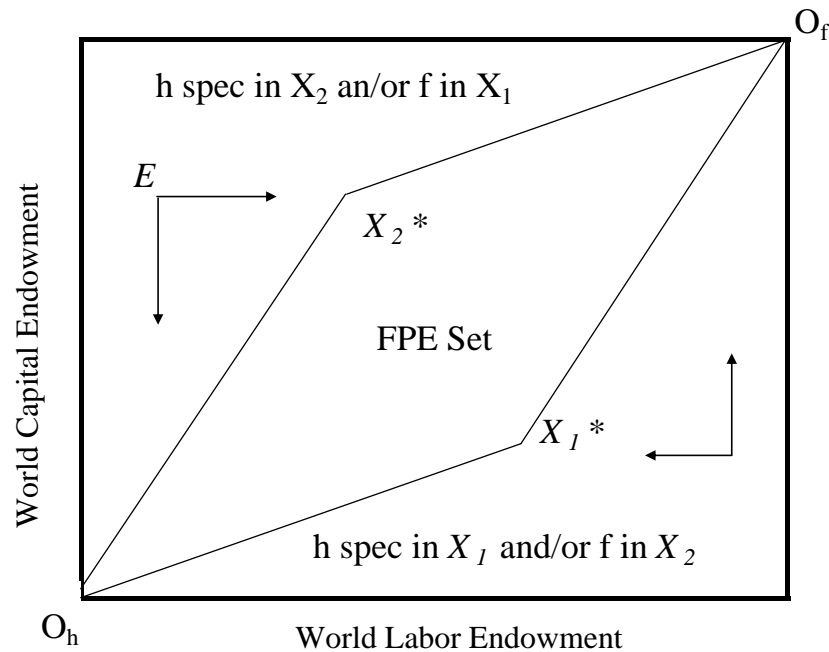


Figure 15.3: Factor trade outside the FPE set



Trade in goods and factors are *substitutes*

3. Trade barriers prevent commodity prices from being equalized, and so factor prices are not equalized.

Each country has a relatively high price for its own import good, and thus a relatively high price for its scarce factor (Stolper-Samuelson theorem).

Factor trade tends to equalize relative endowments and thereby reduce or even eliminate trade. Trade in goods and factors are *substitutes*.

Figure 15.4

Figure 15.5

Figure 15.4: Trade Costs and Factor Prices

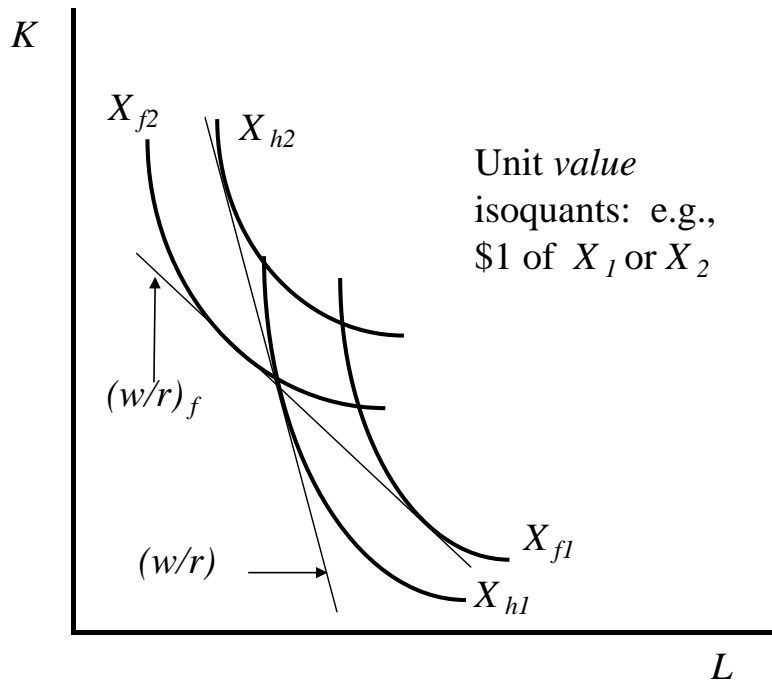
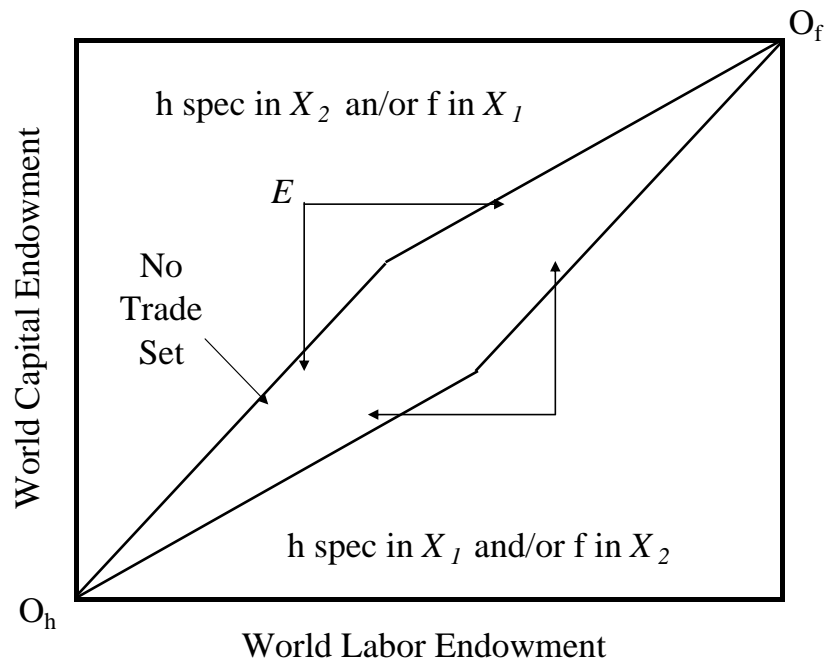


Figure 15.5: Factor trade with trade costs



Factor Trade and Commodity Trade as Complements

1. Differences in technology: add Ricardo to Heckscher-Ohlin.

Suppose that country h has a superior technology in X_1 , the labor intensive sector.

But suppose that countries have equal relative endowments of both labor and capital.

Country h will produce relatively more X_1 in free-trade (in goods) equilibrium. But this will bid up the price of labor in country h.

Then labor should flow to country h until all X_1 is produced in country h. Trade in goods will increase.

Figure 15.6

Figure 15.7

Figure 15.6: Country h has technical advantage in X_1

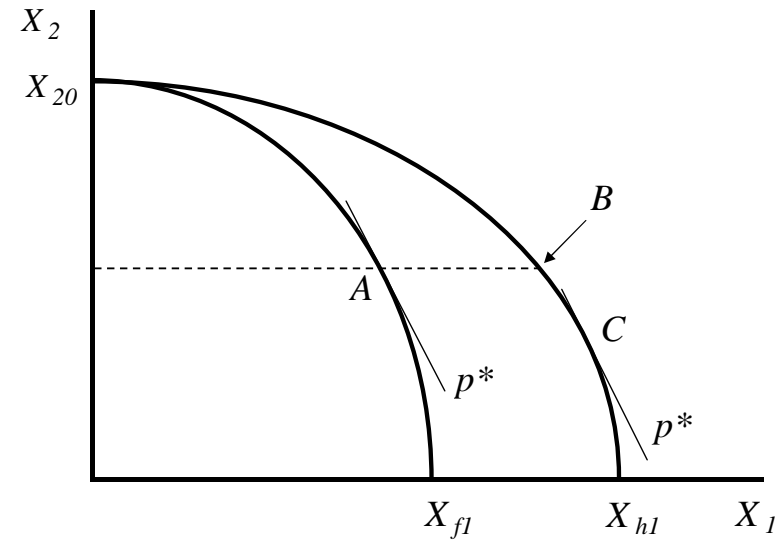
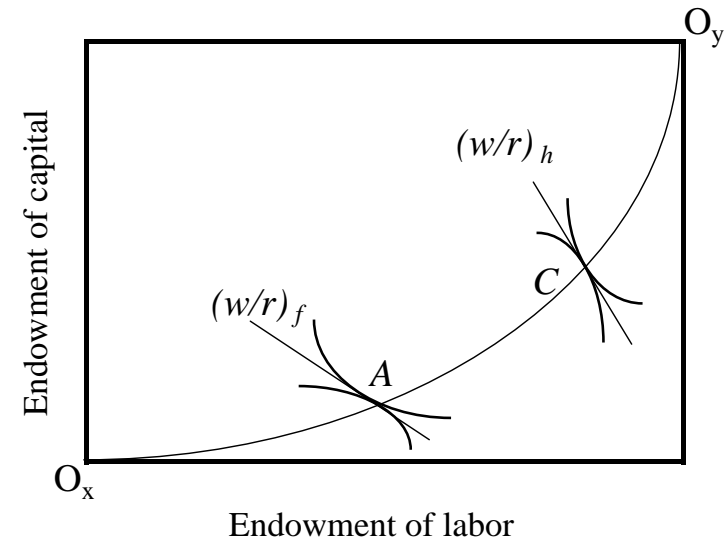


Figure 15.7: Factor prices with technology differences



If Silicon Valley has a higher productivity in computer hardware and software, then engineers will move there.

They may move from where they are scarce to where they are abundant.

This is commonly referred to as “brain drain”.

2. Distortions: e.g, a production subsidy to X_1

Suppose that we have two absolutely identical countries except country h subsidizes X_1 production.

Country h has a higher price for L (used intensively in X_1) and a lower price for K . (Stolper - Samuelson theorem)

If labor is allowed to move, it will flow into h and h will become even more specialized in X_1 , f will become more specialized in X_2 (Rybczynski theorem).

The volume of trade will increase: trade in goods and factors are *complements*.

3. Increasing returns to scale

Suppose that two identical economies specialize. Figure 15.8

They the economy that specializes in the capital-intensive good will have a relatively high price for capital and vice versa for the country specializing in the labor-intensive good.

Figure 15.8: Specialization with identical countries

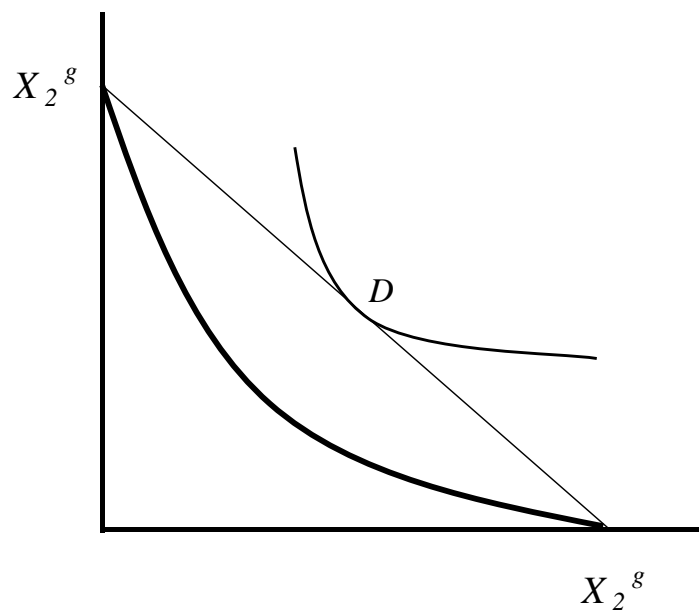
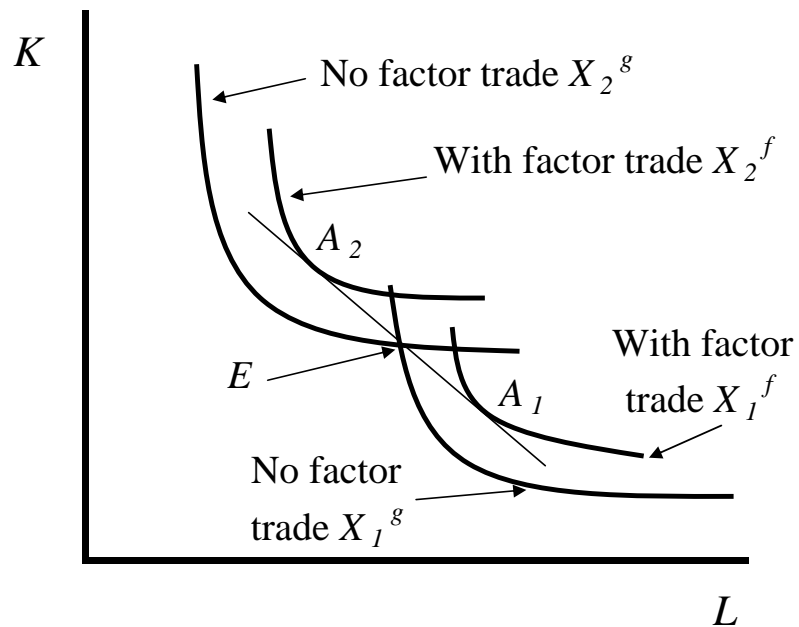


Figure 15.9: Adding factor trade



Then capital will flow to the country specializing in the capital intensive good, expanding that sector further.

Factor trade can make the initially-identical country different in relative endowments.

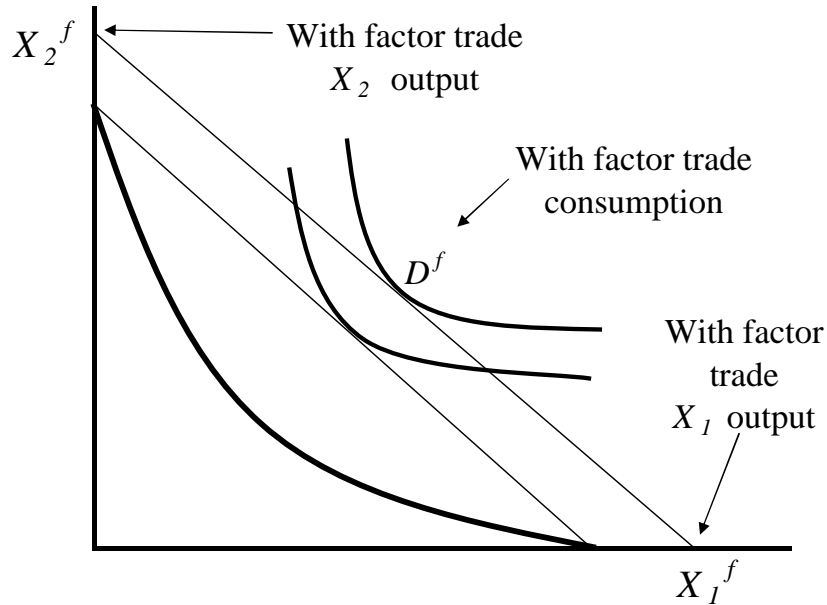
Figure 15.10

This is also the key insight of the so-called “new economic geography”, in which an initial equilibrium with countries having identical factor endowments is *unstable*.

Differences in factor endowments arises *endogenously* if factors can move. *Ex post*, countries will be relatively well endowed with factors used intensively in their export industry. Mimics Heckscher-Ohlin!

Figure 15.10: Factor trade and goods trade

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Summary

1. There are many possible types of trades, some of which may be equivalent in welfare and factor-price (income distribution) outcomes, but which look very different statistically.

Goods can be traded for goods, or factor service trade can substitute for goods trade. E.g., a country can export capital instead of capital intensive good.

2. In some cases, trade in goods exhaust all possible gains from trade; in particular, this occurs if trade in goods results in factor-price equalization.
3. In the case of the Heckscher-Ohlin model, trade in goods may not equalize factor prices do to specialization and/or trade costs. There are additional gains to be achieved by trading factors.

While trade in goods and factors are welfare complements, they are substitutes in terms of trade volumes in the HO model.

4. For many other underlying causes of trade, trade in goods and factors are both welfare and trade-volume complements.

When countries have identical factor endowments but

ricardian differences in technology

production distortions that differ across countries

strong increasing returns to scale

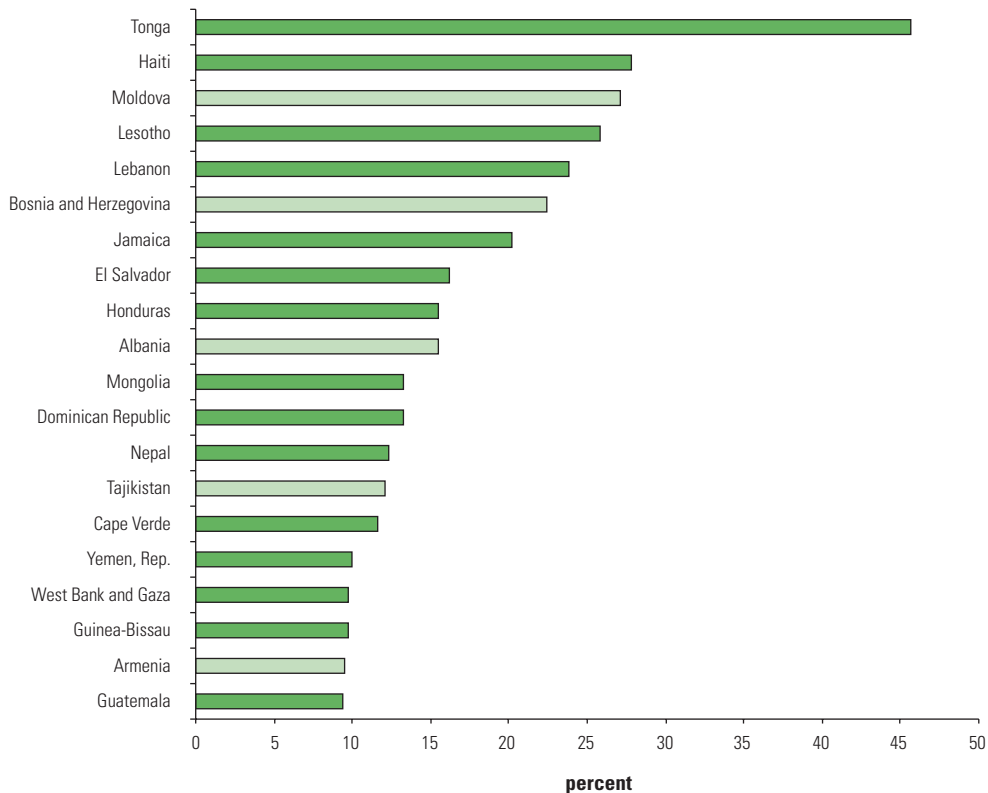
allowing factors to move increases the volume of goods trade and leads countries to be relatively well endowed with factors used intensively in their export industries.

the HO observation becomes a *result* of trade, not a *cause*.

FIGURE 2.1

Leading 20 Remittance-Receiving Countries in the World

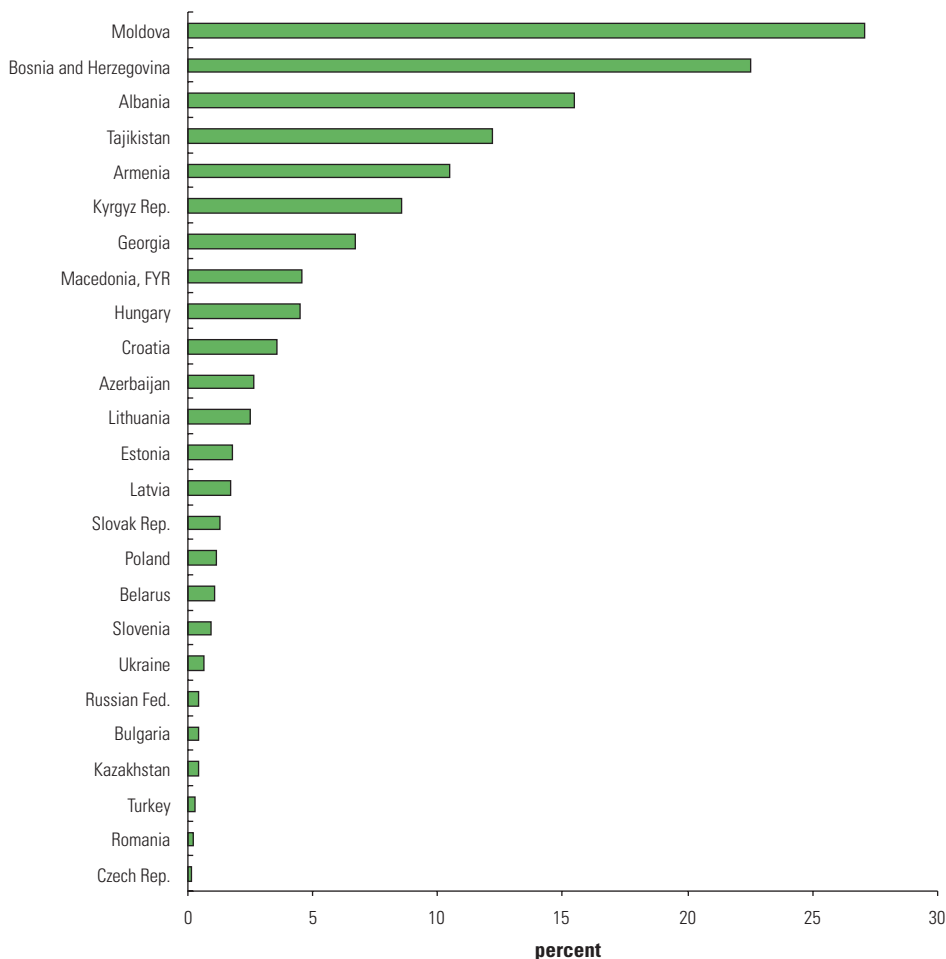
(percentage of GDP in 2004)



Source: IMF Balance of Payment Statistics; World Bank.

FIGURE 2.2

Remittances as a Portion of GDP in Eastern Europe and the Former Soviet Union, 2004

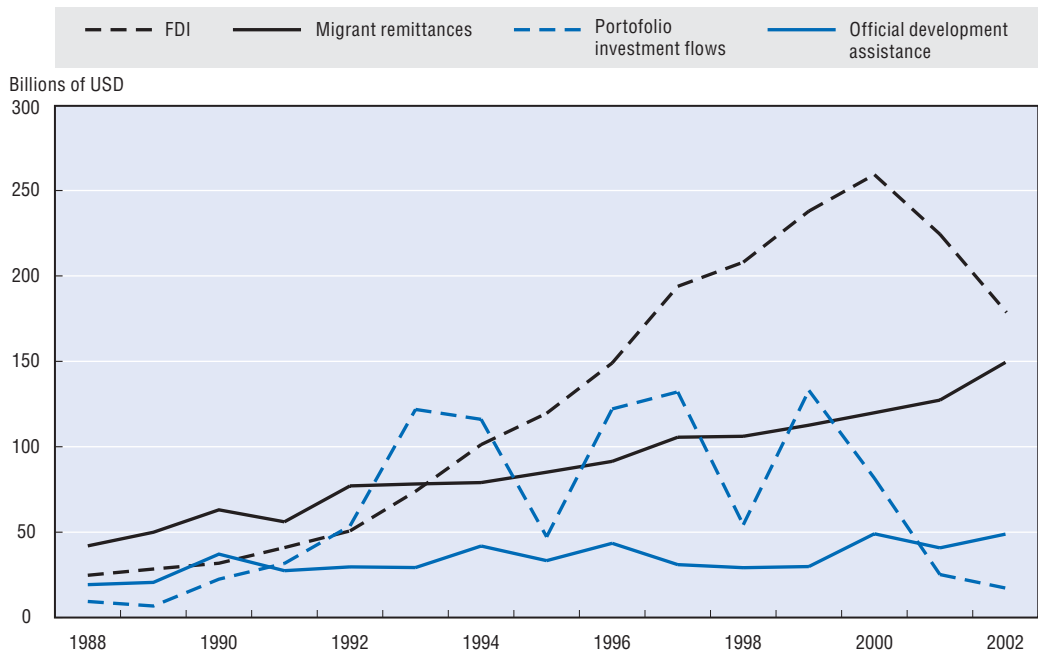


Source: IMF Balance of Payments Statistics.

Note: Received remittances = received compensation of employee + received worker's remittances + received migrants' transfers. Albania and Slovak Republic are

Chart III.1. Migrants' remittances and other capital flows to developing countries, 1988-2002

Billions of US dollars



Note: "Remittances" refer to the sum of the "compensation of employees", "worker's remittances" and "other current transfers in other sectors"; "Official flows" include general government transfers both current and capital.

Source: IMF, *Balance of Payments Statistics Yearbook*, various issues.

Statlink: <http://dx.doi.org/10.1786/532553067068>

Table III.2. Top 30 developing countries with the highest total remittances received, 2002

Millions of US dollars

	Total remittances (USD millions)		Total remittances (USD millions)		Total remittances (USD millions)
India	14 842	Turkey	2 990	Indonesia	1 682
China	14 383	Egypt	2 946	Ukraine	1 670
Mexico	11 464	Brazil	2 863	Romania	1 646
Philippines	7 660	Chinese Taipei	2 547	Ecuador	1 470
Korea	7 586	Dominican Republic	2 497	Croatia	1 400
Pakistan	5 413	Colombia	2 403	Thailand	1 380
Poland	3 824	Jordan	2 227	Czech Republic	1 343
Israel	3 783	Guatemala	2 081	Jamaica	1 333
Morocco	3 294	El Salvador	2 071	Rep. of Yemen	1 300
Bangladesh	3 121	Russia	1 817	Sri Lanka	1 296

Note: "Total remittances" refer to the sum of the "compensation of employees", "worker's remittances" and "other current transfers in other sectors".

Source: IMF, *Balance of Payments Statistics Yearbook*, 2003.

Statlink: <http://dx.doi.org/10.1786/326418524774>

and more than 20% of the GDP in Cape Verde, Jordan and Moldova (Table III.1).

Table III.1. Top 30 developing countries with the highest remittances received as a percentage of GDP, 2002

	Remittances as % of GDP		Remittances as % of GDP		Remittances as % of GDP
Tonga	41.9	Albania	15.6	Uganda	9.2
West Bank and Gaza	36.7	FYROM	15.2	Guatemala	8.9
Lesotho	25.8	Nicaragua	14.6	Pakistan	8.9
Jordan	24.0	El Salvador	14.5	Morocco	8.8
Cape Verde	23.3	Republic of Yemen	12.5	Georgia	8.3
Moldova	22.8	Dominican Republic	11.7	Sri Lanka	7.9
Vanuatu	18.4	Ghana	11.3	Latvia	7.5
Bosnia and Herzegovina	18.4	Armenia	11.2	Sudan	7.2
Guyana	18.2	Honduras	11.1	Ethiopia	6.8
Jamaica	16.7	Philippines	9.9	Bangladesh	6.6

Note: "Remittances" refer to the sum of the "compensation of employees", "worker's remittances", and "other current transfers in other sectors".

Source: IMF, *Balance of Payments Statistics Yearbook*, 2003; World Bank, *World Development Indicators*, 2003.

Statlink: <http://dx.doi.org/10.1786/614135851320>

Table III.3. Top 30 developing countries with the highest remittances per capita received, 2002

US dollars

Remittances per capita	Remittances per capita	Remittances per capita			
Israel	583	Dominican Republic	289	Korea	159
Tonga	563	Slovenia	288	Belize	154
Barbados	512	Cyprus	280	Mauritius	139
Jamaica	510	FYROM	278	Czech Republic	132
Jordan	431	Latvia	270	Tunisia	114
West Bank and Gaza	344	Bosnia and Herzegovina	234	Mexico	114
Malta	332	Albania	229	Chinese Taipei	113
Cape Verde	321	Vanuatu	209	Ecuador	112
Croatia	320	Guatemala	174	Morocco	111
El Salvador	317	Guyana	167	Honduras	109

Note: "Remittances" refer to the sum of the "compensation of employees", "worker's remittances", and "other current transfers in other sectors".

Source: IMF, *Balance of Payments Statistics Yearbook*, 2003; World Bank, *World Development Indicators*, 2003.

Statlink: <http://dx.doi.org/10.1786/701528020322>

Foreign Assets in the U.S.: Net, Capital Inflow {+}: Billions of Dollars: S

