

Trade in Nontradables : Proximity Requirements and the Pattern of Trade in Services**

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Abstract

One of the important differences between goods and services is that, unlike goods, services must be used as they are produced. This often requires direct interaction between user and provider. In this paper, I discuss the implications of proximity requirements for the establishment of service exporters in import markets, the pattern of trade, and for the pricing behavior of international service firms. This approach allows us to focus on how the determinants and implications of trade in services differ from those associated with trade in goods. It is demonstrated that proximity requirements have significant implications for the pattern of trade.

I. Introduction

Because of initiatives by the United States, services have become an important element of the Uruguay Round of trade negotiations. Developing countries have expressed concern about this new emphasis on services, and the unknown effects of granting developed countries access to their domestic service markets (See Ewing, 1985 : Gibbs, 1985 : and Bhagwati, 1987). Policy interest has led in turn to an upsurge of theoretical interest in trade in services. As attention has been focused on trade in services, it has become apparent that, in comparison to goods, relatively little work has been done regarding trade in services.¹ Recently, Deardorff (1985) and Bhagwati (1984a,

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**I would like to thank both Jose Mendez and Arvind Panagariya for helpful discussion.

1. As Victor Fuchs has noted, the compromises necessary for theoretical analysis have generally been made at the expense of services related issues. In reading typical economics textbooks, "the uninformed reader would never have imagined that most of the economy is not involved in farming and manufacturing." (1985, p.314).

1987) have both emphasized the importance of interaction between user and provider and the related requirement for proximity between user and provider for service transactions. However, the implications of these requirements for the pattern of trade in goods and services have not been fully explored.

In this paper, I analyze trade in services and factor proximity requirements, focusing on the need to establish a local presence in service export markets. Emphasis is placed on the implications of proximity requirements for the pattern of trade in goods and services. This approach leads to some interesting results. I demonstrate that when establishment of a local presence is necessary, the direction of trade in services may run counter to the direction suggested by pre-trade prices. In addition, competitive international service firms may charge different prices for their products in different markets. The introduction of trade in services may also lead to a decline in the price paid for services in service exporting countries, and to an increase in the price paid for some services in service importing countries. In such a case, trade results in a divergence of certain final service prices. This decline in the cost of services in exporting countries does not depend on the realization of scale economies, but rather on the mechanism by which services are traded. I also demonstrate that when physical interaction or proximity requirements are relaxed and producer or intermediate services become tradable, the direction of trade in goods may actually be reversed from what it would be if they had remained nontradable. This is because international service transactions make it feasible to locate different direct and indirect production activities in different countries. The reallocation of production activities associated with trade in intermediate services suggests that developing countries may be able to attract selected industries by liberalizing trade in intermediate services.

This paper is concerned with services other than transportation services. These include both producer /intermediate services and consumer services. This paper is organized as follows. Section II discusses the distinction between trade in services and factor mobility. It is argued that, when establishment of a local presence is needed to facilitate trade in services, actual trade involves trade in producer or intermediate services. Section III discusses proximity requirements and the direction of trade when traded intermediate services are used in the production of nontradable final goods and services. Section IV discusses trade in a producer service used to produce tradable goods. The results of the paper are summarized and conclusions are made in Section V.

II. The Tradability of Services

According to Hill(1977), a critical distinction between goods and services is that services are consumed as they are produced. As a result of this characteristic, service transactions usually require interaction between user and provider. Goods, on the other hand, can be produced and stored for later consumption or transactions. This section discusses this distinction between goods and services.

The assumption often made in the theoretical trade literature that services are nontradable has been based on the perception that, given the requirement of interaction between user and provider, services can not be stored for transactions which take place after the time of production. This means that services cannot be stored for shipment and exchange at a later date.² However, while interaction is a necessary aspect of service transactions, it does not automatically mean that all services are nontradable. Because of technical change, it is possible for the user and provider of services to interact at a distance. This interaction may be through electronic information flows and other modern telecommunications channels, or through temporary physical movement of personnel and equipment.

Based on the element of interaction between user and provider, Bhagwati(1984a, 1985) and Sampson and Snape(1985) have developed a typology of services that is useful when considering trade in services. They divide services into those that require the physical proximity of the user and provider, and those that do not. Sampson and Snape refer to services that do not require the physical movement of the user or the provider as separated services. Bhagwati refers to these as long-distance services. Services that require the physical proximity of user and provider are referred to in this paper as proximity services.

While trade in separated services is analytically identical, in a static framework, to trade in goods, the similarity breaks down when comparing goods and proximity ser-

2. There are some references in the literature to storing services on paper and diskette. "Stored services" sounds oxymoronic if one accepts Hill's definitions of goods and services, meaning that the basic distinction is that services are a flow. However, one can argue that the "storage" of services is really a mechanism for interaction. It does not mean that services are converted into goods, while somehow remaining a service. Rather, user and provider may interact, in part, by exchanging information through physical media like documents, diskettes, and drawings during the service production process. This exchange can involve printed and electronic media. Recent technical changes have resulted in expanded opportunities for such interaction without physical proximity.

vices. Sampson and Snape observe that proximity services can be traded in several ways. These involve the movement of the user, the movement of the provider, or some combination of the two. Trade in services that requires movement of the provider, and in which all value added comes from the mobile factors, is really (temporary) factor mobility. This includes trade in the physical labor component of construction services. If the movement of the factor is not temporary, then it is in effect labor migration or foreign investment.³ In cases where services are "traded" by investment in the importing country or by labor movements, with all value added coming from the investment or mobile factor itself, there is no real trade in the traditional sense, only factor movements. However, such factor movements can also be a mechanism for "real" trade in services.

One can not always distinguish between services that are traded as separated services and those traded as proximity services. Some services can be traded either way. In addition, the distinction becomes confused when a traded service involves some combination of separated and proximity elements. Because of the necessary interaction between user and provider, it is often necessary for the provider of services to establish a presence in the importing country. Once this presence is established, services can then be traded through the local establishment (An example is local American Express offices). In this way, the final product being traded is a combination of a proximity service (the local activities that support interaction) and a separated service. In this case, factor movement-based trade facilitates trade in separated services. Mobile factors (like cross-border movements of consultants and technical personnel) are then a mechanism for interaction. Such interaction through services may also be an important determinant of the pattern of production and trade in goods.⁴

3. This is one reason why the United States has attempted to draw a distinction between trade in services and factor movements. See the Office of the U.S. Trade Representative report *U.S. National Study on Trade in Services*, 1983, pp. 69-74. It is summarized by Ewing (1985). The report was a U.S. submission to the GATT on the services issue. The U.S. has tried to make both labor mobility and investment distinct issues from those related to trade in services. Yet at the same time, the U.S. also argues that restrictions on investment in service industries and visa restrictions can be effective barriers to trade. The reason for these seemingly contradictory positions are to be found in the differences between how goods and trade services are traded, which are discussed later in this paper. Also see Feketekuty (1985) and Gibbs (1985) on U.S. efforts related to liberalization of trade in services.

4. See Francois (1989) on the importance of producer services to the interaction of specialized intermediate producers. That paper argues that the cross-border service activities of intermediate pro-

Nusbaumer(1987, chapter 6) and Deardorff have both stressed that trade in services often requires the establishment of a local presence. "In many circumstances, foreign direct investment is complementary to trade in services"(Nusbaumer, p.165). In the case of finance and insurance, this may be a function of the need to establish a local link to a global information network. Other services, like engineering and architecture, may also require a local presence. Specialized intermediate firms may find it necessary to establish a local, service oriented presence if they are to coordinate their activities with those of other firms in an industry. In addition, multinational product firms often purchase producer services from highly specialized consulting and technical service firms. The multinationals and their related service firms are engaged in a symbiotic relationship, with penetration by multinationals limited by the ability of their satellite firms to follow.

When a local presence is necessary, restrictions on rights of establishment are an effective non-tariff barrier to trade in services. This is true whether establishment involves foreign investment or the right to employ local factors. Service firms may need to hire local factors to facilitate interaction. Restrictions on investing in and operating through local service establishments(involving equipment or personnel not available locally) can also be an effective barrier to trade in separated services that would otherwise be tradable through local offices.⁵ In either case, granting rights of establishment to foreign service firms may affect the pattern of production and trade.

III. Local Presence and the Pattern Of Trade

This section discusses the establishment of a local presence when production of consumer services involves both separated and proximity service inputs. This is the grey area between the two extremes of proximity and separated services described above.

ducers are critical to the international division of labor and to the realization of what Ethier (1982) has called international returns to scale. Impediments like visa restrictions and restrictions on cross-border data flows affect not just actual trade in services, but also the opportunity for firms or divisions of firms in different countries to take part in a global process of specialization in intermediate stages of production. Also see Francois(1988, 1990a, 1990b) on trade in producers services and the division of labor.

5. Such restrictions are legion. They include restrictions on international data flows and location requirements concerning data processing operations, as well as residence and visa restrictions on accounting, legal services, advertising, engineering, and other services(See the Office of the U. S. Trade Representative report *Selected Impediments to Trade in Services*, 1981).

In principle, local offices may involve only locally hired factors. This is the case considered here. In this case, once restrictions on establishment are removed, the pattern of trade may run counter to what pre-liberalization prices suggest.

In trying to determine the direction of trade in services, it is important to recognize that when a local presence is necessary, it is producer or intermediate services that are really traded, not the final product of exporting service firms. To illustrate this point, assume a nontradable consumer service can be produced according to a standard linear homogeneous production function, using inputs of capital and labor. Furthermore, assume that the production function for services can be decomposed into central and front office activities, designated C and F. These activities are also produced according to linear homogeneous functions, and these activities enter implicitly into the production function for services. Services are thus linear homogeneous in C and F. Also assume that there are two tradable goods, X_1 and X_2 , that are produced according to linear homogeneous production functions, and that C is more capital intensive than X_1 and X_2 and that F is more labor intensive than X_1 and X_2 . The principal component of the cost function for services (in terms of cost shares) is assumed to be the front office activity. As a result, the production function for services is also assumed to be more labor intensive than X_1 and X_2 . There are no factor intensity reversals. Finally, assume that preferences are homothetic in goods and the nontradable.⁶

Now consider a world economy of two countries (call them home and foreign) where X_1 , X_2 , and S are produced and consumed subject to the conditions described above. Foreign country values are designated by a *. Relative factor endowments are assumed to be different enough to rule out factor price equalization, with the home country being relatively capital abundant. This means that endowments lie outside the factor price equalization set of factor endowments. As Bhagwati (1984b) has demonstrated, we can use a Lerner diagram to show that in this case the price of the service is less in the labor intensive country as long as our service remains nontradable. However, when we go beyond Bhagwati's analysis and decompose this service into tradable and nontradable components, trade may run counter to what these relative prices suggest. This is demonstrated using Figures 1 and 2. In Figure 1, the line with slope $-w$ corresponds to the wage-rental ratio in the home country, while the line with slope $-w^*$ corresponds to the

6. The arguments presented here can be generalized to an n-good case by assuming that we can rank goods according to factor intensity. The critical assumption is then that services are more labor intensive than those goods which are produced in both countries. See Deardorff (1979).

wage-rental ratio in the foreign country. The curves in Figure 1 are isoquants, and represent the amount of each good or service that can be purchased with one unit of X_2 in the home and foreign country. The good X_2 is defined as the numeraire. The price of X_1 is P_1 , while the prices of S in the home and foreign countries are P_s and P_s^* respectively. Figure 1 assumes that the foreign country specializes in services and X_2 . In general, one of our countries must specialize when we have sufficiently different relative endowments. At market clearing world prices, the $X_2=1$ isoquant represents one unit of X_2 , while the $X_1=1/P_1$ isoquant represents the amount of X_1 that can be bought with one unit of X_2 . It can be seen that services are initially cheaper in the labor-abundant country. Because factor prices are not equalized, and unit of X_2 buys more of the service in the foreign country ($1/P_s^*$) than in the home country ($1/P_s$). However, this does not mean that the labor-abundant country will necessarily export services once establishment of local offices is allowed.

While the consumer service itself is nontradable, assume that the central office activity used as an input in its production can be traded electronically as a separated service. However, to trade central office activities, firms in the exporting country must establish a front office in the importing country (For example, American Express must be able to open local offices overseas to sell services that are produced, in part, in the United States). This front office can be set up with locally hired factors. The front office performs activity F , which facilitates the interaction between user and provider and makes trade in activity C possible.

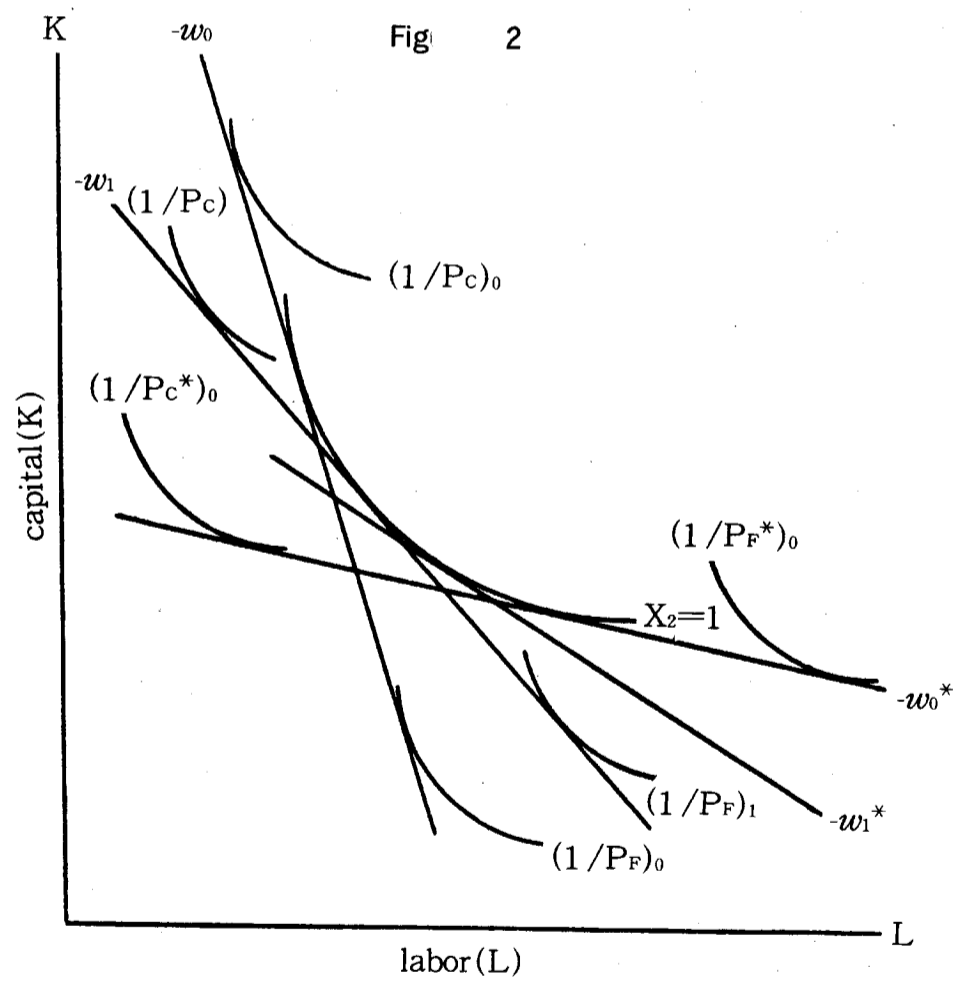
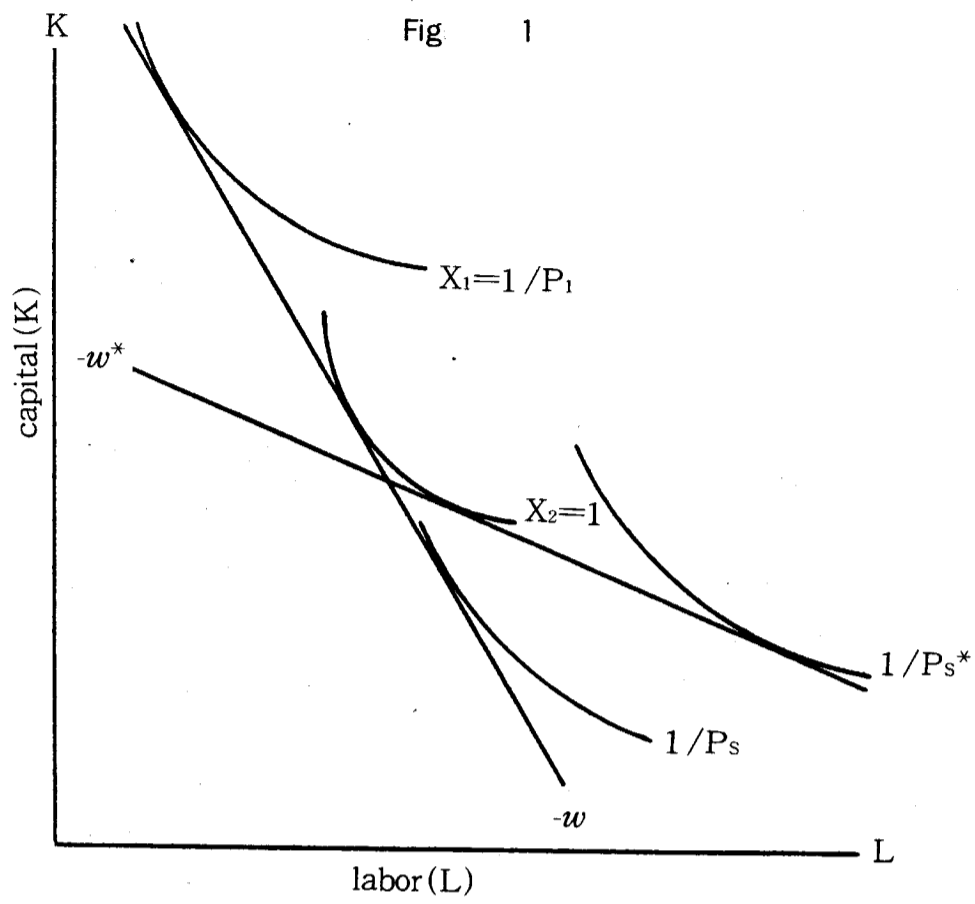
If establishment is allowed, firms in the capital-abundant country will establish offices in the labor-abundant country. It will appear that services are imported by the country with the lower pre-liberalization price.⁷ To see this, consider Figure 2. Figure 2

7. Deardorff (1985) obtains a similar result in a model where "management" services are produced by a single factor, and argues that trade in services may run counter to what pretrade prices would suggest, or in other words that comparative advantage appears to break down. In his model, the factor management is used in combination with labor to produce a nontradable consumer service. Deardorff's emphasis is on the role of technology and absolute advantage in determining trade in services. This paper argues that in cases like that considered by Deardorff, what is really being traded is an intermediate or producer service. Trade in producer services does follow the direction that pre-trade prices suggest it would. When trade requires the establishment of a local presence employing local factors, the only "trade" in services that really takes place is trade in producer or intermediate services. In national accounts terms, revenue earned by local factors working for foreign service firms (which appears as an export by those foreign firms) will be netted out by payments to those factors.

presents pre- and post-liberalization factor price ratios and associated isoquants. I assume that both countries continue to produce X_2 after trade in services is introduced, and that factor prices are not equalized by trade. Initial factor price ratios are represented in Figure 2 by the lines with slopes $-w_0$ and $-w_0^*$. The isoquants in Figure 2 indicate how much one unit of the numeraire is worth in terms of central office and front office activities. The implicit prices of activity j before and after trade in services are designated in the diagram by $(P_j)_0$ and $(P_j)_1$. It can be seen that, at wage-rental ratios w_0 and w_0^* , the central office activity is cheaper in the home country, while the front-office activity is cheaper in the foreign country. This means that **unless trade** in services results in complete factor price equalization, services will **remain cheaper** in the foreign country in our example. This is true even after services **become** "tradable". With trade, all central office activities will be produced in the home country (unless the home country becomes specialized completely in central office activities, and is small relative to the foreign country). If ownership is identified with central office activities, then service firms from the home country will "take over" the foreign market. Competitive firms servicing both markets will charge different prices in the different markets.

Because it is really the intermediate service that is traded, it will appear that the price of the consumer service is not equalized by trade. In addition, when more than one service is being produced and consumed, some services may actually become even less expensive in the service exporting country following the introduction of tradability. In terms of Figure 2, assume that we introduce trade in a large class of services, including the service discussed above, and that this drives factor prices closer together, say from w_0 and w_0^* to w_1 and w_1^* . This means that the home country price of front office activities for our service will decline from $(P_F)_0$ to $(P_F)_1$. Depending on the relative cost shares of front and central office activities for any particular service, this decline may be enough to offset the increasing price of central office activities and to lead to an overall decline in the price of certain services. The result is that, as the home country starts to export services, the price of some services in the home country may actually decline. By similar arguments, the price of some services in the service importing country may actually increase as services are imported.

When trade in services requires the establishment of a local presence, the pattern of trade in services may appear to run counter to what pre-trade prices suggest. The resulting changes in service prices may also appear to be counter-intuitive. While this will not necessarily be true, it is quite possible. This is because the need for a local presence means that the direction of trade in services really depends on the price of the



separated producer services that serve as inputs. Allowing service firms to establish a local presence in foreign markets results in trade in these intermediate or producer services. Even with free trade, final service prices will not be equalized short of factor price equalization (though the price of the traded intermediate service will be).⁸

IV. Traded Producer Services and the Pattern of Production

This section discusses the effect introducing trade in producer services has on patterns of production when services are used as inputs to the production of tradables. It contrasts the two extremes of intermediate services being completely nontradable (perhaps due to restrictions on establishment or on cross-border flows of information and personnel) and services being freely tradable (the removal of such restrictions). This can also be thought of as a model of the effect technical change has on production and trade as it makes services increasingly tradable through long-distance interaction. It is demonstrated that when trade in a producer service is introduced to our model, factor price equalization becomes more likely. In addition, the pattern of production and trade in intermediates and final goods may actually be reversed.

Assume that we again have two goods, X_1 and X_2 , and a service S which are produced according to linear homogeneous production functions using capital and labor. However, the service is now used as an input in the production of X_2 . Further assume that the production for X_2 can be decomposed into the producer service activity S and a direct production activity A . The activity and service inputs are both produced according to linear homogeneous production functions, so that X_2 is linear homogeneous in A and S , and S is relatively capital intensive, while A is relatively labor intensive. Good X_1 lies between S and A in factor intensity. There are no factor intensity reversals. Homo-

8. When looking at the prices charged by multinational service firms that sell through local establishments, one should expect these prices to vary across national markets. This variation in prices charged is not necessarily an indication of price discrimination or any other "unfair" trade practice, but rather is an indication of the variations in the cost of providing front office or other local activities in those markets. In the example in the text, service exporting firms will charge less in their export markets for their final product than they would charge in home markets. If one defines the final product as what is exported, these export firms could be accused of "dumping" into their export market at a price below what they charge in home markets, when in fact they are pricing at cost. To the extent local market activities are an important element of production costs, analyses of the pattern of trade in services really require data on the separated and proximity activities used to produce "traded" services.

thetic preferences are also assumed.⁹

Consider again two countries(home and foreign) characterized by these production technologies and preferences. A^* will again be used to designate foreign country values. The world endowment vector(K, L) is represented by the vector OO^* in Figure 3. The endowments of both countries can be represented by points in the box OLO^*KK . In an integrated economy equilibrium(the equilibrium conditions that result when factors are fully mobile), the vector OM represents the quantity of factors L and K that would be allocated to producing S .¹⁰ Similarly, MN corresponds to the factors employed in producing X_1 , and NO^* corresponds to the factors employed in activity A . O^*M' , $M'N'$, and $N'O$ are identically determined, with O^* as the origin instead of O . With trade in goods and the producer service and with endowments inside the parallelogram $OMNO^*M'N'$, trade will result in factor price equalization. This is because the pattern of production that maximizes the value of output(the integrated economy solution) can be reproduced within the factor price equalization set defined by $OMNO^*M'N'$. Nontradability means that production involves combining locally produced services with direct production activities, so that S and A must be produced jointly. Thus, with trade in goods alone, the factor price equalization set is reduced to OZO^*Z' . The vector OZ' is the sum of vectors ON' and $M'O^*$. It is obvious that the set OZO^*Z' is smaller than the set $OMNO^*M'N'$. Figure 3 demonstrates that, when services become tradable, factor price equalization becomes more likely(since the factor price equalization set is larger).

When factor prices are not equalized, either one or both countries will specialize in certain production activities. The exact pattern of specialization depends on factor en-

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9. One can consider the tradable producer service to be central office activities, which are likely to be relatively capital and human capital intensive. However, trade pattern reversals obviously can also result with the introduction of trade in labor intensive service inputs. Either way, trade in services will likely result in an increased global division of labor.
 10. The integrated economy equilibrium is treated extensively by Dixit and Norman(1980). Figures 3 and 4 are based on analysis and diagrams found in their text. Formally, we can define an expenditure function $E(.)$ in terms of utility and goods prices. Given our assumption about the homotheticity of preferences and technology, it can also be specified in terms of S, A , and X_1 . A revenue function $R(.)$ can also be defined in terms of prices and endowments. The equilibrium conditions are defined by setting $E(.)=R(.)$ and by setting $E_p(.)=R_p(.)$, where P is the vector of prices for S, A , and X_1 . Given the equilibrium solution to P , these prices can in turn be used to solve the partials R_{K_e} and R_{L_e} for the prices of labor and capital. These in turn can be substituted into the partials of the unit cost functions corresponding to S, A , and X_1 to obtain unit input coefficients. Together with the quantities consumed, (defined by $E_p(.)$), these define the vectors OM, MN , and NO^* of Figure 3.

dowments. In the case of Cobb-Douglas technologies and preferences, the region outside the factor-price equalization set can be divided as in Figure 4.¹¹ The divisions are symmetric (i.e. area A' corresponds to area A). When services are nontradable, the home country specializes in X_2 and the foreign country produces X_1 and X_2 when endowments are in area $(F' + B' + A')$. Similarly, when endowments are in region $(D' + E' + C')$ the foreign country specializes in X_1 . The regions $(F + B + A)$ and $(D + E + C)$ have similar characteristics. When endowments are in area $(F + B + A)$, the foreign country specializes in X_2 .

If endowments are outside the factor-price equalization set, the direction of trade in goods, not just the volume, may change in this model as services become tradable. Assuming tradability, the home country specializes in S when endowments are in area D , which is a subset of area $(D + E + C)$. This means that as services become tradable, the home country stops producing X_1 for export (as it did before tradability) and instead imports both X_1 and X_2 when endowments are in area D , specializing in the producer service S . The direction of trade in X_1 is reversed. Similarly, when trade in services is introduced, the foreign country specializes in activity A in area A , which is a subset of area $(F + B + A)$. The foreign country stops producing activity S (which it was engaged in, along with activity A , before tradability) and specializes in physical production activity A , importing both X_1 and S and exporting X_2 . The service sector in the foreign country shuts down.

The tradability of producer services implies that indirect production activities can be traded like intermediate inputs and that a greater degree of specialization of these activities across different countries is possible. This is an important implication of the technical changes that are making trade in services possible. In a more general context, trade in services may also mean that different direct production activities that were once carried out jointly can instead be performed in different countries, coordinated by producer services. The increased opportunity for specialization in turn means that factor price equalization becomes more likely. Given that different direct and indirect production activities may involve different factor intensities, the division of a unified operation into direct production activities and tradable indirect service activities will lead to

11. The division of the region outside the factor-price equalization set into specialized production sets is discussed at length in Chapter 4 of Dixit and Norman (1980). The discussion of the characteristics of those sets in the text is based on that chapter, and the reader is referred to that chapter for additional exposition.

Fig 3

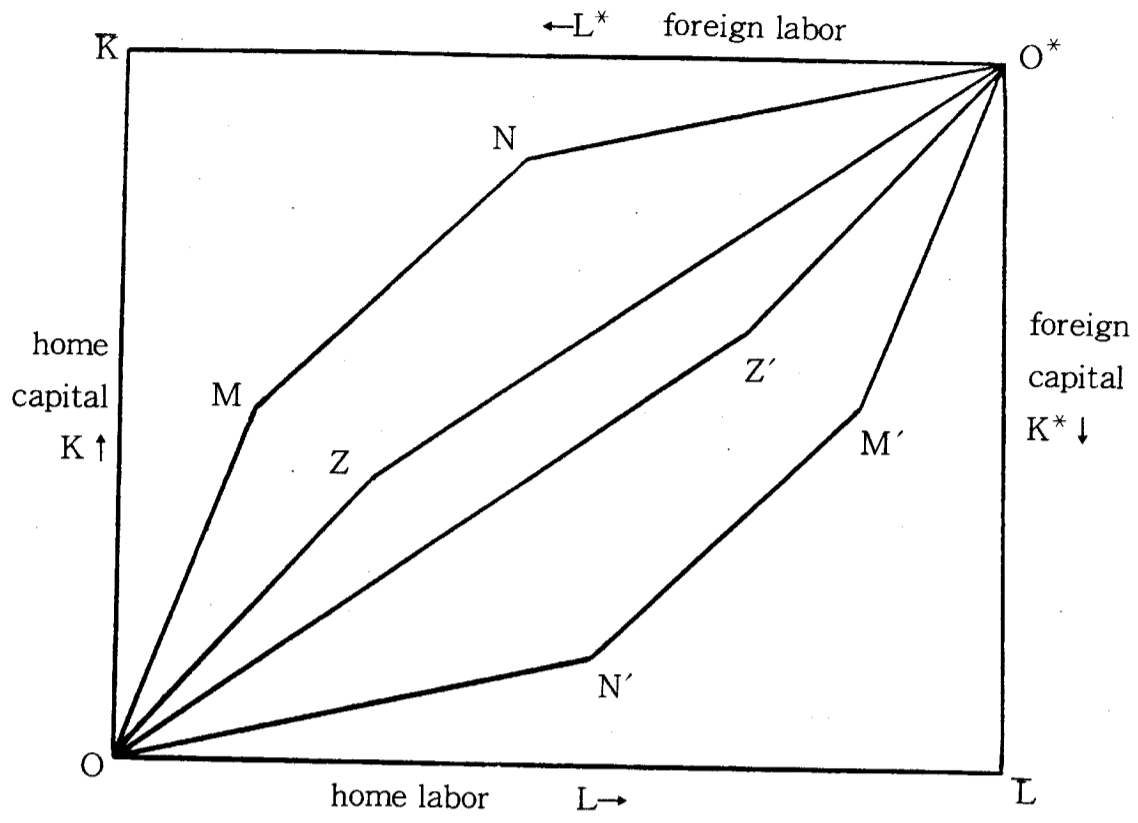
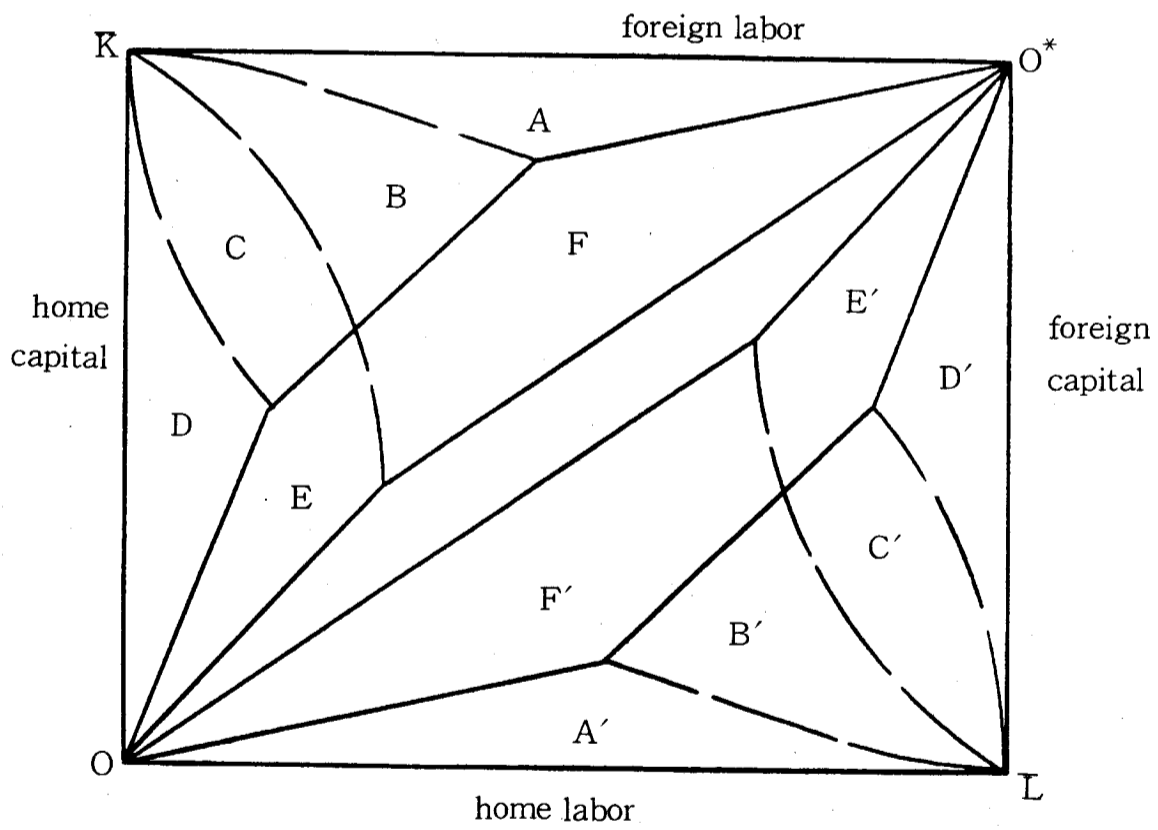


Fig 4



a reallocation of these separate activities across countries as a part of this specialization process. In the extreme, this reallocation may lead to a reversal of the direction of trade in intermediates and final goods.

V. Summary and Conclusions

In this paper, I have discussed some of the implications of proximity requirements for trade in services, focusing on one of the basic distinctions between goods and services, the need for interaction between user and provider. Emphasis has been placed on the need for international service firms to establish a local presence in order to "export" services. This approach has allowed us to focus on how the determinants and implications of trade in services differ from those associated with trade in goods.

It has been argued that, when a local presence is to facilitate trade in otherwise nontradable goods or services, such trade really involves trade in producer or intermediate services, which are combined with locally produced services to produce the "exported" goods or services. The local market services may be produced using either locally hired or imported factors. In such cases, it appears that trade runs counter to the direction that the pre-trade prices for services suggests. This is because the final goods or services are not what is really traded. In addition, it is quite likely that under such circumstances, trade in services will fail to equalize the price of the final goods or services sold by international service firms. International service firms may charge different prices for their products in different markets, even if they behave competitively.

If the "tradable" component of services tends to be capital or human-capital intensive, liberalization of trade in services may mean that services are then exported from "high-cost" service markets in developed countries to "low-cost" markets in developing countries. At the same time, introducing trade in services may mean that the price of some services falls in these developed countries and rises in service importing low-income countries. This means that pre-liberalization prices are not necessarily a good indication of the potential pattern of trade. In addition, not all service prices will necessarily fall for importers as they liberalize trade in services. This is because the need for a local presence implies that, even with trade, final prices depend both on the price of local factors and on the price of tradable intermediate service inputs. The relative cost of traded and locally produced service inputs will change as additional opportunities for trade affect factor prices.

Trade in services also implies a reallocation of production activities across coun-

tries. This may be a desirable result for those countries concerned by the new emphasis in GATT on services. As trade restrictions are relaxed and trade in producer services increases, the resulting increased degree of international specialization and associated reallocation of production activities across countries may actually lead to a restructuring of production and trade. This means that developing countries may be able to attract manufacturing activities now located in developed countries by liberalizing trade in intermediate services.

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