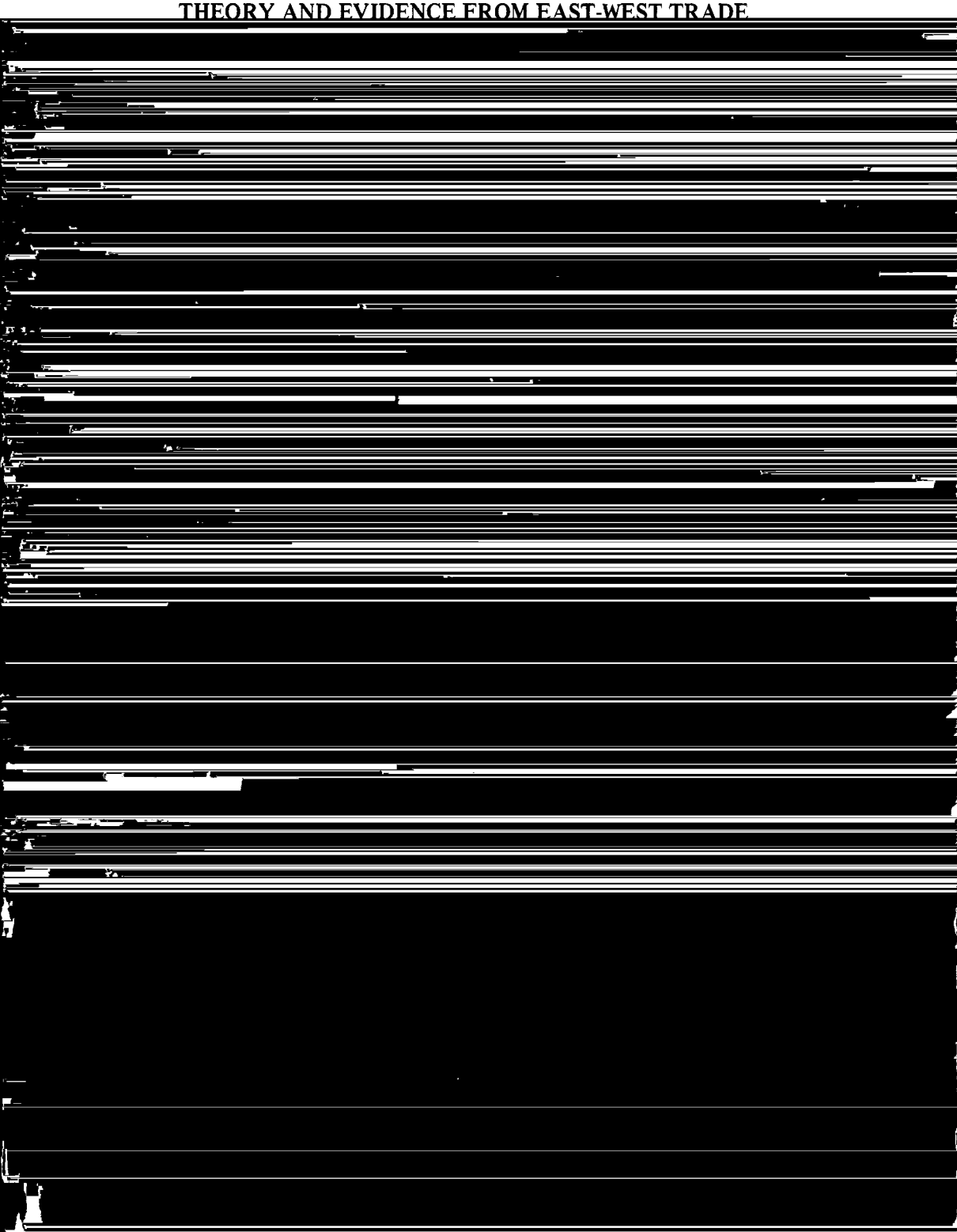
ON DESIGNING CONTRACTS TO GUARANTEE ENFORCEABILITY: THEORY AND EVIDENCE FROM EAST-WEST TRADE



particular goods, but also contractual mechanisms by which it can acquire risk-shifting and managerial services. On the other hand, the western firm is concerned not only with the pricing of the contract, but also with the enforceability of its terms. The selection of a one type contract over another depends, therefore, upon the extent to which it provides these services within a framework which assures enforceability.

The relevance of contract selection is particularly important when placed in the wider context of the growing use of countertrade agreements that serve as conduits for world trade. For example, some recent estimates published in the popular press have indicated that countertrade may be responsible for 20 percent of world trade. The impetus behind the apparent growth in countertrade stems clearly from the financial constraints facing many countries. No matter what the impetus, however, the existence of

example, are reduced. If the sales contract is coupled with an agreement that delays payment, then there is also an elimination of incentives to perform on the implicit debt contract in certain cases.

A transaction cost analysis suggests that such a relationship is likely to be characterized by monitoring and arbitration costs. We would expect that these services would be provided within the firm rather than through the market place. In other words, foreign direct investment should be the governance structure for such types of transactions.

By using the properties of foreign direct investment as a benchmark, this paper explains why one type of contract is chosen over another. The explanation rests on the premise that because of the prohibition on FDI, contracts are used which most closely replicate the enforceability of proprietary claims inherent in intra-firm trade, yet provide the services of risk-shifting and management. The next section analyzes some chronic weaknesses in the foreign trade sector of the centrally-planned economy which generate the need for certain kinds of services. Section two presents a typology of some commonly used contracts in East-West trade in terms of their managerial, risk-shifting and enforcement capabilities. The third section presents some empirical data to test qualitatively the contention that self-enforcing contracts predominate over other alternatives. The conclusions suggest extensions of the findings to other areas of research and point also to implications for a revival of a macroeconomic story of foreign direct investment.

The methodology of this article is similar to that used by Williamson (1980). First, we establish *a priori* what kinds of discriminating criteria can be used to evaluate the merits of a contract. Next, contracts are compared in terms of whether they meet these criteria. Based upon this qualitative assessment, a prediction is made as to which contract is likely to be predominant. We do not expect that only one contractual form will exist. But to the extent that our criteria captures most of the underlying phenomena, we can expect one contract to be predominant for specified classes of traded goods and services. An examination of unexplained variance by a case-by-case method—which we do not attempt here—is needed to pinpoint the institutional facets which explain these deviations. We do not attempt such an investigation in this article, though it is hoped that the framework developed below may be used in future studies in order to increase the comparability across case studies to study questions of contract design.

WEAKNESSES IN FOREIGN TRADING

The motives for eastern European countries and the Soviet Union to import risk-shifting and managerial (especially marketing) services stems from systematic weaknesses in the organization of their foreign trade activities. The use of long-term contracts is by no means isolated to East-West trade or to trade between developing and developed countries. What

makes East-West trade particularly interesting is that there are chronic weaknesses regarding the capacity of the centrally-planned economy (CPE) to respond to price variability and/or sales volume variability, weaknesses which promote the use of contracts, such as countertrade agreements. These contracts are, consequently, used relatively frequently. This section explains the weaknesses of the CPE in terms of three primary factors: 1) slow reactions to market changes, 2) insensitivity to buyers' needs, and 3) costly mechanisms of risk shifting. Though the details of our analysis are based on the German Democratic Republic (GDR), it applies generally to other East European countries.

Slow Reactions to Market Changes

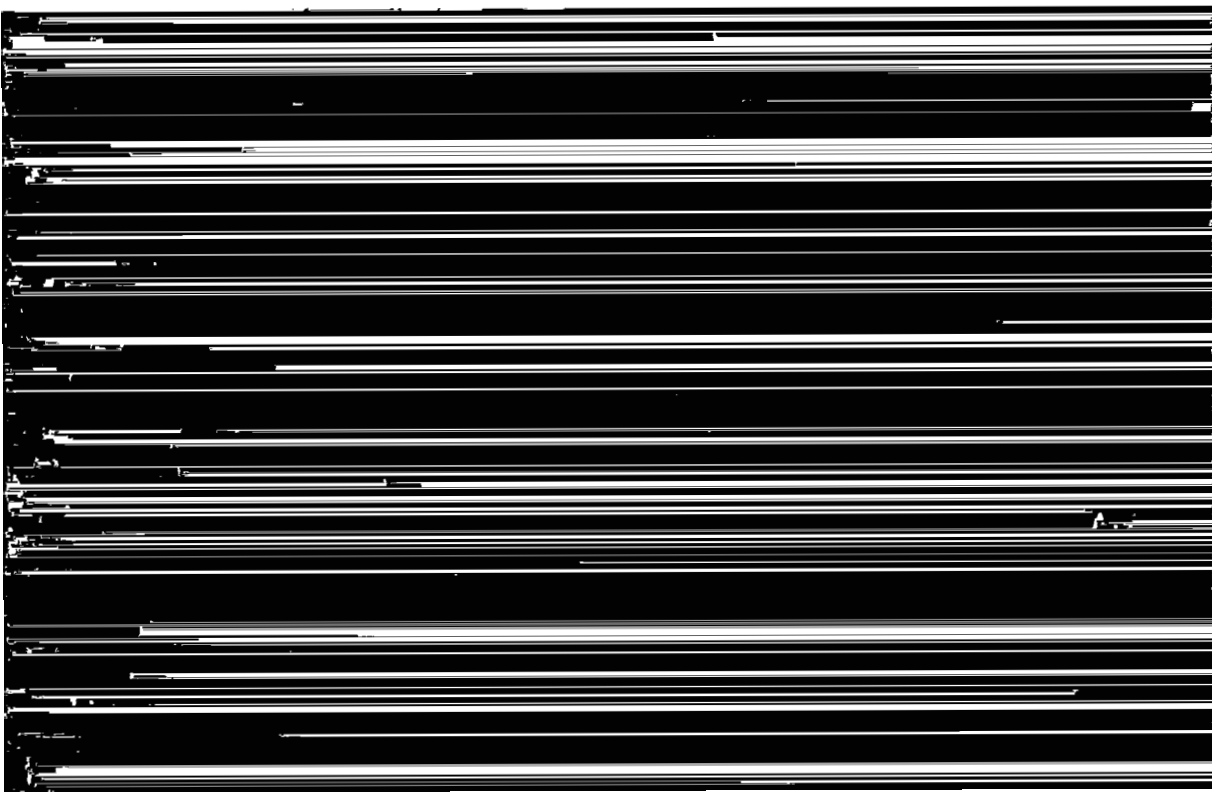
A common complaint in the managerial literature published in the GDR concerns the slow reactions of firms to changes in foreign markets.[2] Import demand is, thus, fairly unresponsive to changes in foreign prices, as suggested by the price elasticities of the GDR's demand for western imports.[3] In a study by Vanous (1981), the price elasticity of the GDR's demand for western machinery and consumer goods were estimated to be nearly perfectly inelastic. Estimates for other commodities were found to

is earmarked for either internal manufacturers who must meet their plan or for foreign buyers with long-term contracts. Since the FTE incurs stiff penalties for delays in meeting contractual obligations, it cannot shift sales to the high price bidder. Moreover, long-term contracts are especially prevalent between firms of CMEA countries. Some 70% of the trade of the GDR is with CMEA countries and this trade cannot be redirected. When foreign demand increases, the firm is not in the position to meet new orders. The upper tail of the returns distribution is truncated, since the firm cannot increase production to take advantage of higher output prices.

Insensitivity to Buyers' Needs

Production of high quality and technologically-sophisticated products has been a chronic difficulty for the CPE. In addition to anecdotal evidence, some indications of quality problems of traded goods can be inferred, as Holzman (1979) points out, from data on the composition of trade. Sales of machinery are less price sensitive, more quality sensitive relative to sales in commodities. In East-East commerce, notes Holzman, trade in machinery plays a significant role. In East-West commerce, eastern machinery exports is markedly less important relative to raw materials, suggesting the difficulty of East European countries and the Soviet Union to compete on quality. Even for the GDR, which is purported to be more developed of the CMEA countries, a similar reversal in trade composition can be seen.

In part, this failure is an outcome of the sellers' domination of commercial transactions in domestic trade. Sellers' domination stems from principally



stems from at least three factors. First, the factors of production are not flexible in the long-term plans. Second, because bonuses are tied to profitability, changes in foreign prices and demand have direct consequences for income distribution. Lastly, because of the linking of the bonus system to the plan, the riskiness of foreign sales distorts the incentive system by rendering it more arbitrary. From the point of view of the CPE, therefore, the riskiness of foreign prices and sales interrupts planning mechanisms and distorts internal incentives.

Risk from foreign sales can be reduced either through diversification or shifting. Diversification is achieved by the pooling of different capital assets with less than perfectly correlated returns. In a capitalistic economy, the concept is easily illustrated by a portfolio of securities which can be generally shown to have a total variance lower than the sum of the variances of the individual securities. Risk shifting is the transfer of risk to individuals or firms which are willing to bear it. An illustration of risk shifting is a forward contract which guarantees an individual the right to buy or sell foreign exchange at a fixed price at a certain point in time from a bank. The bank bears, therefore, the risk that the spot rate may deviate from the contracted forward rate. Thus, there are two relevant questions: who bears the risk? and how is risk reduced?

The GDR has created two mechanisms to reduce the variability in bonuses due to price changes on the foreign market. First, any exogenous change in prices (that is, changes which do not stem from changes in product quality or marketing) results in either subsidies if losses ensue or taxes if gains are incurred. The effectiveness of this policy rests on the abilities of central authorities to infer managerial performance from exogenous price disturbances and the bargaining capabilities of firms. The second mechanism is the creation of risk and reserve funds to encourage the use of new technologies and to buffer wages against losses to the bonus fund.

The state subsidies and risk funds shift the incidence of risk from the firm onto the central authority. The risk profile at the central level differs, however, from that of the individual firms, since by the pooling of investments across different industries, the variance of the individual activities is reduced through diversification. The CPE may, therefore, seek to replicate the diversification effects of a portfolio of securities by investing across industries. Clearly, risk reduction through the diversification of real economic activity is costly and inefficient, for the benefits of economies of scale and comparative advantages are lost. (Within the Council on Mutual Economic Assistance, long-term specialization agreements partially permit a division of labor while eliminating risk through essentially barter arrangements.)

Alternatively, risk can be reduced through inward and outward portfolio or foreign direct investment. For example, by investing in foreign extraction industries, increases in the price of raw materials can be hedged. Or by permitting inward direct investment, some of the risk of production

can be shifted to foreign investors. As noted before, however, inward flows of proprietary capital is prohibited, and outward flows are negligible. Though portfolio flows are an insignificant proportion of total international investment, the prohibition on foreign direct investment greatly restricts the CPEs relative to other regions in the world. (Data is provided in the third section.)

A more relevant mechanism than diversification for the CPE is the shifting of risk. A major obstacle is that forward contracts are traded only for a limited number of goods, primarily homogenous commodities. Even if contracts existed for all goods, two types of costs would be associated with their use. First, such contracts entail transaction costs. Second, long-term contracts prevent the CPE from altering its production mix as relative prices change. Thus, there are real opportunity costs.[8] Parenthetically, it should be noted that unlike participation in world equity markets, the use of forward or future contracts does not provide any diversification benefits. Consequently, the CPE faces limited opportunities to reduce risk through diversification.

CONTRACTUAL SERVICES

Given the organizational properties discussed in section one, the centrally-planned economy can seek to remedy its institutional weaknesses through various forms of contracts. The implications of these weaknesses can be usefully grouped under deficient managerial expertise and risk-shifting mechanisms. Slow response time implies that the changes in foreign markets are weakly transmitted or that market signals are not salient in respect to managerial incentives. Similiarly, poor product quality represents a lack of technical and managerial expertise or the incentives to produce competitive goods. The prohibition on foreign direct investment deprives the CPE of efficient ways to diversify and shift risk.

Contracts with western firms can be designed to provide these functions. A western firm contributes managerial services and information regarding the opportunity or scarcity values of economic resources, the demand characteristics of foreign markets, and technology. In addition to providing information on present and forecasted trends, western firms provide distribution, marketing and advertising services, areas in which socialist countries have been historically weak.

Contracts can also be designed to provide risk-shifting services. A western firm may be more willing than its eastern counterpart to bear the risk for principally three reasons. First, by participating in diversified world or national financial markets, its shareholders can more easily reduce the total risk. Second, it is able to bear the risk more easily, because its factors of production, namely labor, are not fixed. To the extent to which factor markets are competitive and supply elastic, firms can respond to demand surges and, by laying off workers, to shortfalls. Lastly, given long-standing

relationships with banks and other financial institutions, risk can be laid off through hedging and other financial means at lower transaction costs.

Despite the incentives for the transfer of managerial skills and risk-shifting functions, obstacles to their provision exist due to the costs of contract enforceability. The willingness of the western firm to supply managerial and risk-shifting services is partly a function of the extent to which a contract is enforceable. The problem is, of course, the same for the eastern firm, but the key difference is that it is invariably the western firm which has incurred the up-front investment and exposure.

Contract enforceability can be assured either by effective recourse to third-party arbitration or by the creation of self-enforcing instruments. Recourse to third-party arbitration is often undesirable, for the costs of arbitration and redress are not insignificant and involve prolonged settlement. Under the law of most socialist countries, penalties can only be levied against the assets of the FTE rather than against those of the manufacturer. The assets of the former usually consist only of office property and furnishings. On the other hand, the track record for arbitration in socialist countries is not notoriously poor.[9] But arbitration in any environment is costly and deters contractual agreement if the probability of conflict is significant.

An alternative is the creation of a self-enforcing contract.[10] A self-enforcing contract is created when any willful breach in its provisions leads automatically to penalties for the violator in an amount greater than the potential gain. An example of a self-enforcing contract relevant to East-West trade is the case of co-production in which two firms make bilateral asset-specific investment; the production of one firm is valueless without the component of the second firm. Another example is investment levered through the issue of foreign debt in export industries which produces uniquely for export to the West. Thus, default on the loans is restrained by the hostage nature of the export product.[11] In both of the above examples, the stakes of the two parties are secured through the creation of bilateral hostage exposure.

Trade based on long-term agreements can be channeled through numerous types of contracts. These contracts vary in their provision of managerial, risk-shifting, and self-enforcing services. The principal contracts in East-West trade are briefly considered below and summarized in Table 1.

1. *Spot trading:* Since goods are exchanged for their monetary or barter value, there is no provision of managerial skills and risk-shifting services. Contracts are self-enforcing since payment is immediate.
2. *Industrial cooperation:*
   a. *Compensation:* Compensation agreements vary in type, but most commonly consist of two contracts. The first contract states the value and quantity of the good or equipment sold by the western firm to the CPE partner. The second contract is an agreement by the western party to purchase in the future either the production derived from the sold equipment or other goods. The value of the second contract can be less

TABLE 1

Type of Contract	Managerial Skills	Risk Shifting	Self-Enforceability
Spot trading	No	No	Yes
Trading on long-term contracts	No	Yes	No
Industrial Cooperation:			
a. Compensation	No	Yes	No
b. Co-production	Yes	Yes	Yes
c. Joint Ventures	Yes	Yes	Yes
Foreign Direct Investment	Yes	Yes	Yes

than, equal, or sometimes greater than the value of the first contract. These contracts can be discounted and sold to third parties. Such agreements provide no explicit managerial services in terms of product development and production management, though the western partner can behave as a sales agent. Risk-shifting benefits are acquired by the eastern partner since payment is made essentially through the issuance of a financial instrument with a payout fixed to the stochastic value of the production. (When the western firm has the choice among several products, the financial instrument is analogous to an issuance of a bond indexed to different commodities, among which the bondholder may choose.) The western or third-party purchaser of this contract bears the risk of fluctuations in the value of the tied product. A compensation contract is not self-enforcing, since the western firm provides an up-front product and payment is made in the future.

b. *Co-production:* Co-production agreements provide all three types of services. Co-production contracts assign the western and eastern partner the responsibility to manufacture particular components of a final good. Usually, the western partner provides the components with embodied technology of a proprietary nature. (The western partner also frequently manufactures the complete component in plants outside the partner's country.) By providing production information and marketing skills, a co-production agreement transfers managerial services. Since payment is made in real goods, the eastern partner is not exposed to fluctuations in the unit demand. Net profitability is, however, risky, since the cost of inputs is uncertain. Finally, such contracts are self-enforcing, for as long as the CPE firm must dedicate non-fungible capital assets to the production of these components, any cessation of transactions would render valueless the capital investment.

c. *Joint venture:* Joint ventures are clearly the most direct channel of providing managerial and risk-shifting services. The western partner participates directly in management decisions, and part of the capital investment risk is borne through equity interests. Whether such contracts are enforceable depend upon the nature of the investment. When

the value of the investment is dependent upon a continuing stream of western technology, the agreement is self-enforcing. When the investment is a one-time sunk cost, the western partner's interests are exposed to *ex post* renegotiation or expropriation. We would not expect joint venture under such circumstances given *ex ante* recognition of the unilateral hostage position. Historically, there are a number of examples of joint and fully-owned ventures where the investment was essentially hostage and suffered the costs of renegotiation. (These cases are generically described as "obsolescent bargains" and are particularly common in the mineral extraction industries.)[12]

3. *Foreign Direct Investment:* The joint venture discussed above is, of course, a special case of this type of contract. The above description of the joint venture applies to a hundred percent equity investment with the exception that it is only the government, and not the contractual partner as well, which poses the threat.

In light of the above analysis, contracts can be seen to vary in their provisions of managerial, risk-shifting, and self-enforceability services. The use of these contracts is a function not only of the characteristics of the market and the traded goods, but also the institutional stability of the environment. In the next section, the selection of contracts is analyzed in terms of choosing the correct governance structure for the sale of managerial expertise and risk shifting.

EMPIRICAL EVIDENCE

The importance of the above contracts in East-West trade can be understood by looking at data for trade in other regions. Though no estimates have been made of the amount of trade funneled through contracts, some data exists for the amount of intra-firm, relative to total trade, flows. This ratio is particularly interesting, for it provides information on the significance of foreign direct investment in channeling goods within the firm rather than through markets. A study by the United Nations indicates that 29% of United Kingdom exports and 30% of Swedish exports are conducted on an intra-firm basis.[13] Helleiner (1979) provides data on intra-firm imports into the United States for 1977. His calculations are given in Table 2. The disparity between the regional ratios given in the table below underlines the minimal importance of foreign direct investment as a conduit for goods in the case of the United States and East European and Soviet trade. Though the above data cannot be extrapolated to other countries without care, it is likely that similar trends towards low intra-firm trade between the East and West would be found overall.

If intra-firm trade is relatively insignificant, how important are long-term trade contracts in East-West trade? Unfortunately, neither western firms, nor East European governments provide exhaustive information on the volume of trade flows and the details of the contracts. Rough estimates for some have been provided by two surveys. One study by a group in

TABLE 2

United States Intra-Firm Imports by Region

Product Type	Developed countries	CPEs*	Developing countries	Total
Primary	41.3%	2.8%	49.1%	47.0%
Semi-manufactured	43.4%	8.9%	17.0%	37.6%
Manufactured	61.6%	8.1%	37.0%	53.6%
Total	53.7%	7.7%	43.4%	48.4%

* Yugoslavia and Cuba included.

the Federal Republic of Germany found that approximately 15% of all FRG trade with the East is channeled through counter trade agreements (e.g. compensation or buy-back).[14] A recent OECD study (1981) estimates buy-back contracts between 1969-80 to have been worth between $30 to $48 billion of western exports, $35 to $42 billion of imports from the East.

If indeed some contracts are substitutes for intra-firm trade through foreign direct investment, we predict that these contracts will be relatively abundant. Based on the analysis summarized in Table 1, co-production agreements were argued to provide functions of managerial services, risk-shifting, and enforceability. Thus, co-production agreements resemble most approximately foreign direct investment.

Unfortunately, there is no data which break down trade according to contractual channels. Some rough evidence is provided by a survey conducted by the Economic Commission for Europe.[15] The survey sampled 314 contracts which were in operation as of September 1978. These contracts are categorized under licensing, buy-back, co-production and specialization, sub-contracting, joint venture, joint tender, and tripartite agreements. Joint ventures include equity investments both in eastern Europe and in third countries. Specialization, for our purposes, has identical characteristics as co-production. The findings of the survey are given in Table 3.

The striking aspect of their results is the predominance of the use of co-production agreements. Interestingly, in the cases of Czechoslovakia and Romania, co-production agreements were displaced by joint ventures as the dominant form of contracting, an unsurprising result as joint ventures are a form of internalizing transactions. An outlier is the case of the GDR, for which buy-backs were the most frequent type of contract. (Buy-back agreements obligate the western firm to purchase a specified amount of goods produced by the plant equipment it initially sold.) Some care is needed in interpreting the data by country, however, due to small sample problems. The GDR comprised only 2.2% of the sampled contracts; Czechoslovakia, 2.9%; and Romania, 8.9% Some indication of the trade-off between joint ventures and co-production at the country level can be inferred for the case of Yugoslavia. (These results are not reported in the table.)

TABLE 3

Share of the Various Types of Contract in the Total Number of Industrial Co-operation Contracts, with Breakdown by Country

(in %)

	Licensing	Buy-Back	Co-Production	Sub-Contract	Joint Venture	Joint Tender	Tripartite Agreement
Bulgaria	--	--	63.7	9.1	27.3	--	--
Hungary	2.6	1.3	44.7	9.2	17.1	5.2	19.7
Poland	22.2	24.1	37.0	3.8	1.9	7.4	3.7
GDR	--	71.4	28.6	--	--	--	--
Romania	--	3.6	14.3	7.2	67.9	--	7.1
Czechoslovakia	22.2	--	11.1	--	66.7	--	--
USSR	2.4	27.2	57.4	--	8.6	3.9	0.8
TOTAL	6.1	17.4	45.2	3.8	16.9	4.2	6.4

Source: Economic Commission for Europe, *East-West Industrial Cooperation*, United Nations, New York, 1979.

Joint Ventures included both sales and production agreements. Joint Tenders refer to the execution of an investment project by a western and eastern firm.

Tripartite agreement is the same as a joint tender, except that a third partner from a developing country is added.

(Figures derived from a sample of 314 contracts at end of September 1978.)

Based on a sample of 100 Yugoslavian contracts, the ECE surveys co-production and specialization agreements to comprise only 19.2% of all contracts, whereas joint ventures comprised 66.2%. Despite the crude nature of the data, the evidence supports the *a priori* claim that co-production agreements are imperfect substitutes for foreign direct investment.

Similar results were found in other surveys.[16] One study found co-production and specialization agreement comprised 35.4% of Swedish contracts with eastern partners, though 41.7% were in the form of buy-back or compensation. Another survey found that in 1977, 58.2% of sampled Hungarian contracts consisted of co-production agreements; another 8.7 were specialization agreements.

Unquestionably, the above data is not conclusive. First, Table 3 presents data according to the number of contract types used, whereas the volume of trade channeled through each contract is also of interest. Such information is not available, probably because of its proprietary value. Parenthetically, it should be noted that the relative importance of market transactions does not vitiate the findings. Some trade will be eliminated in the absence of foreign direct investment or may shift to the market, thus raising the proportion of spot trading.

Secondly, as suggested by the above comment, the structure of trade between the East and West is likely to differ from that of other regions. Thus, the use of western data for purposes of comparison is not a perfect control. One way to strengthen this comparison is to compare the use of

contracts and foreign direct investment at a sectoral level. Though there is no data broken out by sectors, the available evidence suggests that co-production agreements are more common in industries with advanced technology, whereas compensation is used for standard goods.[17] Such a trend is consistent with the claim that technology transfer tends to be internalized through foreign direct investment or through similar contractual alternatives.

Certain factors suggest, moreover, that these numbers have a conservative bias in estimating the substitutability of contracts for internalization. One bias is that the externalities between contracts are not included in these numbers. Some contracts which are not self-enforcing can be *bundled* with other agreements through cross-default provisions. For example, debt contracts include cross-default provisions which often stipulate that default on one obligation results in default on all outstanding debt. Or a western firm involved in a compensation agreement may also enter into a co-production contract. The western partner can protect against losses by maintaining other plants which produce the part manufactured by the eastern firm. Default on providing quality goods as required by the compensation contract leads to cancellation of the other agreement. Another downward bias stems from the possibility that the risk of default can be priced and embedded in the cost of contracts which are not self-enforcing

NOTES

1. Transaction-cost economics has been most influentially developed by Williamson. (See Williamson, 1975 and 1979.) For independent developments in the literature on foreign direct investment, Buckley and Casson, 1976; Magee, 1976; Rugman, 1980; Calvet, 1981; and Hennart, 1982. (For a review, see Kogut, 1983.) It seems obvious, however, that internalization theory is a subset of the general theory of transaction-cost economics, with the difference that macro-economic variables must be considered in the former to explain the location of foreign direct investment.

2. See, for example, Bayer and Kosser, 1981.

3. While export supply price elasticities are also of interest, their estimation is hindered by severe problems regarding relative prices and capital constraints.

4. A discussion of a third source of profits, that of meeting the currency plan, is suppressed, for lack of information on its importance.

5. The concept of taut planning was first developed by Hunter, 1961.

6. The following draws from Kornai, 1981.

7. Technology must be planned for an annual and five-year duration. Since the technology plan has a constrained claim on economic resources, a stochastic increase in the demand for a certain kind of technology cannot be any more easily accommodated than the change in the demand for any input.

8. This can be demonstrated analytically. Assuming that the profit function is convex, Varian shows that profits are higher with flexible than with fixed prices. Define the profit function as F(P, W), where P is the price of the output and W is the cost vector for the inputs. A fixed price is calculated as a weighted average of two prices (P1 and P2), with weights q and $1 - q$, respectively. By the convexity of the profit function, it follows:

$$qF(P1, W) + (1 - q)F(P2, W) > F(qP1 + (1 - q)P2, W)$$

The intuition behind this result is that production is not constant. When prices go up, the firm produces more, and thus profits are higher. See Varian, 1978.

9. For a short description on arbitration, see Grzybowski, 1972.

10. For an excellent statement on self-enforcing contracts, see Klein, Crawford, and Alchian, 1978, who derive equilibrium conditions for investments in enforceability, and Telser, 1980, who works out the intertemporal setting. A recent treatment comparing contingent contracting, arbitration, and monitoring costs can be found in Shavell, 1984.

11. Loan conditionality on the Siberian pipeline is an illustrative case. Western banks and firm stipulated as a condition for granting credit that no eastern European country be allowed to participate in the building of the pipeline. In the case of default, therefore, the gas cannot be costly redirected to other CMEA countries.

12. A classic statement of this problem is given in Vernon, 1971.

13. Figures are drawn from Helleiner, 1979.

14. See F. L. Altmann and H. Clement, 1979, *Die Kompensation als Instrument in Ost-West Handel;* cited in OECD, 1981.

15. Reported in Economic Commission for Europe, 1979, *East-West Industrial Cooperation.*

16. Reported in "Reciprocal Trading Agreements in East-West Trade," *Economic Bulletin for Europe,* 1982.

17. See "Trends in East-West Industrial Cooperation," *Economic Bulletin for Europe,* 1981.

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