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ACCUMULATION AND THE TRANSFER OF TECHNOLOGY: ISSUES OF CONFLICT AND MECHANISMS FOR THE EXERCISE OF CONTROL

by

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ABSTRACT

The transfer of technology from developed to underdeveloped economies is almost always associated with a conflict of interests between the supplier and the recipient of technology. Where this conflict arises control is exerted by the more powerful party to ensure that the conflict is settled in its favour. It is argued in this paper that control is allied to the power to determine the rate and type of accumulation of capital. A number of potential areas of conflict are discussed, and this is followed by a discussion of the mechanisms which the various parties can use to settle conflict in their favour.

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INTRODUCTION

Despite recent concern with distributional considerations, economic development requires the growth of production in underdeveloped countries. The long run growth of this output results from the expansion of the capital stock, a process which we will refer to as accumulation in this paper. While accumulation need not incorporate new techniques of production, the changing composition of output and the existence of new, more productive techniques generally ensures that accumulation in developed and underdeveloped economies alike incorporates new techniques of production.

These new techniques result from the systematic application of science and technology to production. The overwhelming bulk of this activity, commonly referred to as research and development, takes place in the developed economies where it is increasingly concentrated in large firms involved in production and marketing in various parts of the world economy. These firms obtain proprietary rights over new techniques and are concerned to exploit this monopoly power to ensure that they maximise their share of the rewards which result from their use. This may involve the sole utilisation of these techniques or their sale to other producers, the precise strategy of course varying with particular circumstances.

Underdeveloped countries may require these technologies if they are to maintain or increase their rate of economic growth. A variety of links have thus been established to enable the transfer of this technology from developed to underdeveloped economies.

Any set of complex relationships between different individuals or groups of people is likely to lead to some misunderstanding and conflict. But in the case of the transfer of technology, conflict does not result merely from misunderstanding others' motives and intentions - it is fundamentally built into the nature of the

transactions[1]. This is because the technolcgy which is transferred is a primary input for the generation of surplus. Control over this technology is thus crucial, not only because it leads to control over the generation of this surplus, but also because it is an important element in the control of the distribution of the surplus.

If it is true that conflict almost always arises in the transfer of technology, it is not always true that the conflict of interests is well articulated due to the varying degrees of development of the various classes involved. We are therefore faced with a variety of responses in the transfer of technology, ranging from complete perceived-harmony, through renegotiation of conflicting arrangements to the fundamental breakdown of the relationship between supplier and recipient.

In this paper we shall be focussing on issues of potential conflict in the transfer of technology and mechanisms which are used to enforce the control of the dominant group. While we may be drawing evidence from a variety of case-studies, we do not intend that this broad survey should be applicable to any specific transaction. We shall not consider all the mechanisms of transfer, but only those which involve the ongoing organised contact between supplier and recipient. Thus we shall not consider issues such as the outright arms-length purchases of technology, nor portfolio foreign investment, nor the utilisation of technical journals; but rather those involving direct foreign investment and contractual agreements (e.g. management, purchasing contracts). It is the continuing aspect of the relationship and the manner in which control is exercised which most interest us in this paper.

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1. This view is not held universally. Vernon for example, argues in relation to conflict over export expansion that perceived conflict reflects a poor flow of information rather than a substantive conflict of interests. One view - a view of which I happen to be a partisan - is that a more adequate flow of information between the less developed countries and the advanced countries concerning market demand and production capabilities would represent both the necessary and the sufficient condition for a considerable rise in exports on the part of the less developed countries. (46, p. 348)

In addition to narrowing our focus to a limited number of mechanisms of transfer, we shall also limit our discussion with regard to the institutional parties involved in the transfer of technology. It is our contention that there are three primary parties involved in conflict in the transfer of technology. These are:-

(1) The technology-supplier. In some cases, particularly in large ventures to extract raw materials, there may be two or more parties involved in the supply of technology. In these cases we do not propose to examine the conflicts which arise between the technology supplying parties, unless it enables a clearer understanding of conflict between the suppliers and recipients of the technology.

(2) The host-partner. Here, too, there may be more than one partner but we do not propose to examine these intra-host-partner conflicts. In many cases, technology may be transferred through a wholly-owned subsidiary or a joint-venture with the host-state, and obviously there is no host-partner participation in this transaction.

(3) The host-state. The host-state in underdeveloped countries is frequently involved in the purchase of foreign technology. Without suggesting that the host-state is a body representing a homogeneous set of class interests, we will give some consideration to its own influence and control over the transfer of technology.

The choice of these three parties is not to deny that there may be other important parties involved in the conflict[2] but we believe that the empirical evidence supports our contention that there are three (and often only two) major partners involved in conflict over the transfer of technology.

An attempt will be made in this paper to situate this conflict arising in the transfer of technology, by relating it to the common interest of the three parties in accumulation. By accumulation we mean the growth in physical capital. There are, of course, difficulties

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2. In particular, international agencies. We shall provide some discussion of their role in the resolution of conflict.

which arise in this limited definition of accumulation. For example, where investment is associated with negative value-added (which frequently occurs in import-substituting industrial strategies), the growth of physical capital in one sector of the economy may be associated with a net decrease in output. Nevertheless, in spite of such difficulties, this partial perspective on accumulation is necessary if we are to adequately explore the nature of conflict and the mechanisms available for its resolution.

One final introductory remark concerns our use of the term 'technology'. We shall be using this term to discuss not only the physical technique of production which is used, but also the disembodied technological input. This is, of course, particularly relevant in discussing management contracts, where it is the ability to supply organisational inputs and technological information which is the primary technology input which is being transferred. It is also relevant in the organisation of marketing outlets for the products of the enterprise.

THE SETTING FOR CONFLICT RESOLUTION

The Extent of Conflict

We shall be examining the interests of three parties in this section - the technology-supplier, the 'national' industrial bourgeoisie and the 'national' state apparatus. The latter two groups are not always well developed in many countries, but we shall be treating them as if they were so. The reason for this assumption is that we are exploring the limits of national control here, and it is in this situation where these two national groups are 'well-formed' that national control is most likely to be exercised, if at all.

There are a variety of specific interests which each party has in the transfer, and these will vary from transfer to transfer and country to country. However, there is one common interest which binds each of the three parties and that is the maximisation of the rate of accumulation. The firm supplying the technology is concerned to maximise its rate of accumulation at the global level, the host-state to maximise accumulation within the economy and the host-partner to maximise accumulation in relation to existing and potential rivals. Indeed it is these individual differences within the common desire to maximise

accumulation which is at the root of much of the conflict which arises in the transfer of technology. It is worth treating the objectives of each party in a little more detail.

The Technology-Supplier: For many firms the optimal size of operations may not be a choice, and expansion may be essential if the firm is to survive. This tendency to grow may occur for a number of reasons. In the first place, the high fixed costs of investment associated with research-intensive technologies and product-differentiating markets will require a high scale of output if unit costs of production are to be competitive. Secondly, these high investment costs will require the mobilisation of substantial sums of money to fund investment and it is easier for large firms to mobilise these large sums. Thirdly, in the interest of risk aversion the firm will be tempted into diversification to avoid the risks of failure in any particular market. Finally, the firm may wish to integrate vertically in an attempt to carve for itself a monopoly position in the market or to ensure the availability of particular, scarce inputs.

This tendency of expansion raises the question of what the firm is trying to maximise. Is it sales, or profits or accumulation? This is not an easy question to answer as the three factors are generally complementary and not exclusive. Yet it is central to our argument that the firm aims to maximise accumulation. Insofar as sales are concerned, this may be an important objective of the firm. Yet sales can not be increased without productive capacity, unless the firm is prepared to establish itself as a merchant enterprise. So the ultimate concern of the firm must be to establish sufficient productive capacity through physical investment to enable the maximisation of sales, without at the same time possessing too great a productive capacity for the market.

It is true that profits are necessary to enable this productive investment but care needs to be taken concerning the role of profits and accumulation by the firm. The distinction between distributed and reinvested profits needs to be kept in mind. The divorce of ownership

from control has meant that distributed profits must be seen as a constraint on accumulation by the firm, enabling management to satisfy shareholders and the firm to maintain its creditworthiness in the market. Further, the surplus which is used to fund accumulation may never appear in the books as 'profit', but may be 'hidden' in inventories or other compartments by transfer accounting practices. Thirdly, profits may not always be re-invested, or may be re-invested somewhere else and thus a high rate of profit may not be associated with a high rate of accumulation. Thus a surplus may be necessary if the firm is to continue to accumulate, but it should not be seen as an end in itself (as in the 'profit maximisation' principle) but rather as a means to enable continued accumulation by the firm.

The Host-Partner: The host-partner also has strategic interests in maintaining or enlarging its own position with respect to domestic or foreign competition. It is indeed this very reason which forces it into a relationship with the technology-supplier. In some cases, the position and growth of the host-partner is closely related to its intimate links with the supplier of technology - one could refer to this type of firm as the 'international' industrial bourgeoisie. At the other extreme the host-partner has a clearly articulated set of conflicting interests with the suppliers of technology - a position which could be referred to as that of 'national' industrial bourgeoisie. The particular aspect of this industrial class will of course vary between underdeveloped countries.[3] Although it is not often that a national industrial bourgeoisie is well developed, there are many underdeveloped countries (e.g. India) where it assumes quite significant proportions. Where both types of industrial bourgeoisie are in existence, they will almost certainly be in a different relationship (particularly with respect to the degree of articulated conflict) with the technology-supplier.

The Host-State: The state, too, has an interest in accumulation. While a clear lack of interest occurs in some cases (Haiti is a good example here), more generally in underdeveloped countries its role has been to attempt to increase the rate of accumulation, and in some cases to control

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3. These industrial classes should not be seen as two distinct and separate sets of actors. The actual situation will inevitably be more ambiguous than has been suggested here and will vary from country to country and from situation to situation. We have been concerned here merely to sketch out two 'ideal types' of behaviour.

not merely its speed but also its nature. For the host-state, control over accumulation is not only necessary in relation to the rate of growth of the economy, but also because the state may desire to influence the composition of output. Control over the type of accumulation may thus assume considerable importance. Finally, the productive relations which exist will almost certainly affect the pattern of distribution. The resulting pattern of distribution may be an important consideration in that it will affect the structure of demand and hence the type of accumulation, it may itself affect the sort of physical capital which is chosen by the innovating class and, insofar as the saving propensities of classes differ, it will also affect the rate at which capital is accumulated.

At the same time that we have noted a common objective shared by all three parties, we should be aware of significant differences which exist. The primary difference concerns the different spheres within which each of the parties is concerned to maximise accumulation. The technology-supplier wishes to maximise accumulation in the global economy. The host-state wishes to maximise accumulation in a particular economy (or region of the economy), as well as to influence the nature of the physical capital which is accumulated and the composition of output. Finally, the host-partner wishes to maximise accumulation in relation to its own rivals. This may, in some cases, lead it to choose a different rate of accumulation to the host-state and technology-supplier in order to avoid upsetting a particular market structure.

These differences are important in assessing the type of conflicts which are likely to emerge and the strategies which the various parties will use in an attempt to resolve the conflict in its own interests. The actual conflicts which may emerge may vary in their intensity. At the one extreme a situation may arise where all of the parties gain acceptable shares of the surplus which arises from a transfer and conflict is centred around points of detail rather than more fundamental issues. At the other extreme, where one or more of

the partners is an absolute loser as a result of the transfer,[4] conflict may be more fundamental and it might be in the interests of one or more of the parties to withdraw from the transaction altogether.

The Involvement of the State

The major sphere of activity for many of the suppliers of technology may be in other developed economies. In these cases conflict is concentrated between the supplier and recipient, and the host-state is seldom involved.[5] Yet in transfers to underdeveloped economies the host-state assumes a far more important role and in many cases the conflict arises between the supplier and host-state and not the recipient.

Girvan (14) relates the role of the host-state in the bauxite industry to pre-colonial patterns, where the crown controlled the natural resources. After independence, the state has assumed this role of the crown and has therefore come to be directly involved in the transfer process itself. But there are other potential reasons, particularly in the manufacturing sector, for the potential interposition of the state in the transfer of technology, such as: (1) The surplus arising from the transfer may be a major source of taxable revenue which enables the state to operate and to finance further innovations. (2) The foreign exchange arising from the transfer (as in the case of export-oriented foreign investment) may be a major source of scarce foreign exchange; or, alternatively the transfer itself may make demands on scarce foreign exchange resources and therefore be worthy of monitoring.
(3) The absence of a national bourgeoisie - especially in economies which have only recently become independent, but also in socialist societies - may force the state to take an important entrepreneurial role.
(4) The national bourgeoisie may pressure the state into conflict with the technology-supplier, as it may require more 'clout' if conflict is to be resolved in its favour.

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4. One feasible situation may be where there is a net loss to the economy in foreign exchange which outweighs the advantage to the host-state of a particular investment because the social rate of return of this scarce foreign exchange may have been higher in an alternative investment.

5. With the exception of Japan.

Vernon, amongst others, supports the idea that the host-state is more likely to be in conflict with the technology-supplier than the host-partner: "...the motives behind the desire for national control differ according to the country and the groups within the country espousing such control. As a rule, the desire for control comes most strongly out of the government sector." (46, p. 336)

In spite of this empirical evidence that the host-state is predominant in opposition to the technology-supplier (See Robbins and Stobaugh(33) and Aharoni (1).), it is important not to represent the state as the representative of a homogeneous set of class interests. On the contrary, the state is more often made up of diverse groups which may have common interests in some areas and divergent interests in other areas, as in the case of the Allende Government in Chile where a common interest in controlling foreign capital was in contrast to a conflict of interests with respect to land reform. In other cases, particularly in large parts of Africa and Asia, the host-state and the technology-supplier may have a symbiotic relationship in which each depends upon the close cooperation of the other, often against the interests of the mass of the population.

The Importance of Control

Where a conflict of interests arises between the technology-supplier and the host-partner and/or host-state, control becomes important. For example if all parties are in complete agreement with regard to the level and direction of export sales, it does not really matter who makes the actual decisions in this respect. But if, on the other hand, the host-state is concerned to maximise exports, and the technology-supplier to minimise exports (which may threaten an existing subsidiary's role or lead to a decrease in the firm's aggregate profits), control over the decision to export becomes critical.

In any case, there may be a number of issues of mutual interest, and a number of issues where conflict arises to a greater or lesser degree. In the latter case, the conflicts may be resolved in a number of ways. At the one extreme they may be so fundamental, and the net advantage to one or

both parties may be so small or even negative, that the relationship may break up altogether. Or the conflicts may be resolved along a continuum of dispute until all parties concerned consider that the best possible bargain has been struck, and the balance of advantage is sufficiently large to make the continued relationship worthwhile.

Precisely at what point the balance finally comes to rest is a reflection of the power which the various parties have. This power gives them the ability to control the conflict and ensure that the maximum possible benefit is actually attained.

The Source of Power

The concept of power receives rather weak treatment in the literature on conflict andcontrol in the transfer of technology. Conventionally the discussion of power has been rooted in a number of areas; particularly, attention has been focussed on monopolistic control over scarce raw materials, equity ownership and military strength as the sources of economic power. Let us take a brief look at each of these three approaches.

Monopolistic Control over Scarce Raw Materials: This approach has received particular prominence since the 'oil crisis' of 1973. It is argued that monopolistic control over existing oil resources has fundamentally altered the balance of power in favour of the existing oil producers. There is no doubt that, in the short run particularly, there will be a substantial transfer of resources from oil consuming to oil producing economies. But the extent of the power of the producing countries depends critically upon the elasticity of supply of oil, and the elasticity of substitution of other forms of energy. In the short run it is doubtlessly true that these elasticities are low, but in the longer run it is probable that other, perhaps more costly, sources of oil will emerge and, at the same time, the relatively high cost of oil as a source of energy will lead to the substitution of other sources of energy. Command over investible resources which effect both elasticities is of course in the hands of the multinational corporations of the developed countries rather than the oil exporting countries.

In these circumstances it is not entirely clear that the 'balance of power' has fundamentally altered. This is best illustrated by reference to two, amongst many, conclusions. Firstly, the assertion by Saudi Arabia and Iran that they will become major industrial powers shows a lack of understanding of accumulation in the world economy. Even if they purchase the most modern automobile and steel plants in the world, they do not necessarily control innovation in these sectors and may well find themselves technologically backward in the space of a decade or more. Secondly, oil, because of its importance to developed industrial economies and the lack of readily available substitutes, represents the limitations rather than the possibilities of monopolistic control over raw materials. By contrast, for example, copper is faced with substitution by aluminium, and within aluminium, bauxite as a raw material is faced with competition from an already known technology using certain clays widely available in Europe and America.

Equity Ownership: This is sometimes argued to be both a source and a reflection of power in the transfer of technology. While it is clearly correct that equity control usually mirrors the balance of power, it is not often the source of power in the transfer of technology. Control can frequently be exercised, particularly in the form of management contracts, when little or no equity is held by the dominant technology-supplier. Stopford and Wells address themselves to this problem in the context of transfers between developed countries:

> The distinction between majority and minority is, of course, rather artificial. In some cases the multinational enterprise may have management control even though it owns less than 50 percent of the shares. Control may be exercised through a management contract, or the local shares may be divided among local parties who do not bond together. It is also possible that the local partners may have effective control over some ventures where the foreign investor has more than half the stock. (40, p. 5, footnote 8)

This point is made in relation to transfers between developed economies. In the case of transfers between developed and underdeveloped economies, it is hardly likely that control may be exercised by a domestic minority ownership. But their general point that equity may not reflect effective control is undoubtedly correct.

Military Strength: This has also been suggested as a primary source of power. At a superficial level this has obvicus validity in terms of sheer physical power. The expenditure of vast sums of money in some underdeveloped countries is often justified by the argument that it will enable the country to become 'independent'. It is open to question, however, what sort of independence is obtained when many of the critical decisions which affect the rate and type of accumulation which takes place in the economy are made by technology-suppliers, often in collaboration with a cooperative host-partner.

A different approach to these perspectives on the source of power has been suggested in this paper. This is that power in the resolution of conflict must be related to the ability to control accumulation in the enterprise. There are a number of factors which are necessary to enable this accumulation to take place. Once financial resources for an investment have been secured, the investor needs to take account of three considerations. The first is to obtain the necessary inputs, such as raw materials, skilled labour and suitable infrastructure. Inevitably these concern the host-state, and, as we shall see, this is an important sphere in which the state can attempt to exercise control. The second problem concerns the transformation of these inputs into an acceptable product. Of primary importance, here, is the technology available to the investor. Since the technology-supplier's main advantage lies in its proprietary control over this technology, this is an important sphere of control for the supplier. Finally, the output must be disposed of. In some cases, particularly in final consumption goods, the technology-supplier will control these market outlets; in other cases, the market will be relatively 'free'.

Insofar as each of the parties has effective control over one or more of these three considerations with respect to the investment, it may be said that its power to settle conflict in its favour is derived from this control. The objective of the holders of this power is to attempt to maintain and reinforce this power, while the other parties will obviously attempt to change the balance in their own favour. To some extent the technology-supplier will by definition exercise power over one or more of these aspects of production, otherwise it would not be involved in the transfer at all. But the precise balance of power will change over time and will vary between countries, sectors and products. The important issue here is that the power to resolve conflicts will necessarily relate

back to these considerations which are essential to enable accumulation to take place. Power is therefore ultimately related to control over accumulation.

This approach on the source of power differs from each of the more conventional approaches discussed above. The control over scarce raw materials is only a partial perspective. Obviously it is an important consideration in accumulation, but it is essentially only part of the problem, and in spite of the prominence given to the power of the OPEC countries, it is of only limited importance in the accumulation of physical capital. Equity ownership only really tells us about the form in which control is exercised and has little to tell us about the source of power. Finally, the exercise of military power needs to be backed by a developed, innovating industrial system. There is a high rate of change in advanced weapons - new missiles must be countered by new sophisticated decoys, and so on. So while it is not true that control over a technically sophisticated capital stock necessarily leads to military power, it is nevertheless unlikely that military power can be exercised in the absence of a technologically sophisticated and expanding economy.

Power in Particular Circumstances

The argument so far has been that the power to resolve conflict essentially arises from power to control accumulation. But in addition to this general point there are a number of specific factors relating to accumulation in the global economy which are relevant in particular situations and which modify the general point made above. These particular factors are relevant for each of the three parties. We shall however only concentrate on the technology-supplier and briefly discuss some of the factors which may influence its behaviour in specific cases. The reason for choosing the technology-supplier and not the host-state and/or host-partner is that it is important to throw some light on the extent to which factors not specific to a particular economy will influence the nature of conflict and its resolution. The host-state and host-partner are largely influenced by considerations specific to a particular economy. The technology-supplier, by contrast, is maximising accumulation at the world level and its behaviour is thus modified by these global considerations.

In most cases, the technology-supplier is operating within a competitive oligopolistic market structure in a world of risk. Its competitive behaviour is characterised by three factors - a rapid rate of innovation (which obviously varies over time and between sectors), 'aggressive' action or 'defensive' reaction, and risk aversion. Let us briefly examine each in turn:

(1) Rapid rate of innovation. Girvan refers to one element of this process as "the planned incremental displacement of its main product line with another". (13) This product differentiation results from the income elasticity of demand for the product, as well as the reaction to a competitive threat. But, aside from the need to produce new products, innovation is also spurred by the quest to reduce unit costs of production or excessive dependence on a particular input.

(2) 'Aggressive/defensive' behaviour. Existence in a competitive oligopolistic market is much like rolling a heavy object up a steep hill - either one pushes forward or one rolls back. Thus the firm either moves ahead or falls behind with respect to its rivals and this frequently involves the transfer of technology to underdeveloped countries. As we have seen, one way of moving forward is to innovate. Another way, however, is to integrate vertically by taking over suppliers or recipients of one's product. For many technology-suppliers, and particularly for those involved in the processing of raw materials, vertical integration means expansion overseas. This is graphically put by Girvan in describing the vertical integration of the aluminium companies:

> Independent miners in the Metropole and Hinterlands alike were transformed into wage labourers, and small capitalists into minority stockholders of the large corporations. For the miners of Montana the enemy became the "capitalist" from New York, for the Venezuelans and Chileans it was to become the "foreign capitalists". Both, perhaps unconsciously, were attacking the same historical development . (12, p. 506)

(3) Risk aversion. Faced with the need to move overseas, and with the variable and changing political climate in other countries, many technology-suppliers are concerned to avert risk. This risk-aversion takes a number of forms: for some raw material producers, the strategy is

"the planned displacement of existing sources of supply", (12) that is, to ensure that they are never dependent upon one or a few suppliers. There are other forms of risk aversion (such as the organised involvement of international organisations in the agreement , diversification into other products and the commitment of as little real capital as possible), some of which we shall discuss in the latter part of this paper.

The particular power of technology-suppliers and their motivation to transfer technology is not only affected by the general context of competitive oligopolistic market structures, but it is also a function of the particular motivation of the supplier to transfer its technology. Some of these particular reasons are:

(1) The quest for surplus. Much of the traditional literature on foreign investment observes that, while rates of return in underdeveloped countries are higher than those in developed countries, (seldom by more than a factor of two), this is not an unduly high rate of return given the risk of foreign investment in the Third World. By contrast, some of the more recent detailed micro-economic research has concluded that effective rates of return on foreign investment are substantially higher than declared rates of return. These high rates of return provide much of the surplus required to finance accumulation. The relevance of this point for the control of conflict in any particular situation is that at any one time the firm may have a particular need for dividends, resources for research and development, funding of investment, the financing of another subsidiary, etc., which affect the optimal timing and extent of return from the transfer of technology. Thus, for example, if the firm has a particular need for funds in a particular year, the host partner or host state may be in an unusually strong position to obtain a concession it particularly wants to achieve.

(2) The quest for raw materials. This is obviously an important motivation for raw material producers and processors. There are two needs here: the need to obtain a reliable and adequate flow of raw materials, and the requirement of alternative suppliers to provide flexibility of sources of supply to the raw material user. (12) Thus, if the technology-supplier has a critical need for adequate raw materials or (by contrast) has a variety of sources of the raw material, this will have an important effect on its bargaining power in any particular situation.

(3) The quest for markets. There are two forms of markets which are required. The first is for the final output of the firm, and the second is for the new or used capital equipment of the firm.[6] Frequently both markets are sought at the same time - Vaitsos, for example, found that in the Colombian pharmaceutical sector, technology which had been supplied was tied to the use of particular branded intermediate products. This tied clause was an important avenue for transfer pricing in Colombia as there was a bar on the level of profits which the companies were permitted to remit.

(4) The quest for spreading research and development costs. Research and development expenditure is characterised by high minimum levels of activity and great economies of scale. As a result there is a considerable incentive to spread these research and development costs. This can be done in a variety of ways - by royalties on output, by a subsidiary's'contribution' to research and development costs, by the capitalisation of know-how, and so on.

(5) The quest for an export base. In the case of an established product with an established market, there may be incentives to situate production overseas. Vernon (46) has characterised this as the 'product-cycle theory' where production is situated overseas in the 'mature phase' of the product. One variant of this phenomenon is that of the runaway industries, where the labour intensive components of a process (e.g. the punching of computer cards) are done in a cheap-labour economy.(16)

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6. In a vertically integrated firm, new equipment may be both an output and an input.

We have paid some attention to the international context of the technology-supplier in order to illustrate our assertion that power in the transfer of technology varies in different situations and, to a considerable extent, the power of the technology-supplier is not just a function of its control over a particular technique, but also a function of the world context within which the accumulation takes place.

Insofar as the host-partner and/or host-state are and have been related to the international context of accumulation in the production of a particular product, its power too may be contingent upon the international context of innovation. For example, Faber and Potter point out that the partial nationalisation of the Zambian copper mines in 1969 took place in the context of a world shortage of skilled mining engineers. As a result, the government's bargaining position was severely weakened by the inability to call upon alternative sources of technical knowledge. (11, chapter 4)

More pertinently, and certainly more intangibly, is the relationship of the host-partner and/or host-state to international capital in general. Puerto Rico, for example, has a rather special relationship with the U.S., which gives it special access to capital and technology. To what extent a series of past agreements between the host-state, the U.S. government and U.S. corporations binds the power of Puerto Rico partners in any particular agreement is not precisely clear, but it does suggest that there may be only limited room for manoeuvre before the special relationship to the U.S. economy is adversely affected.

CONFLICT RESOLUTION: ISSUES OF CONFLICT IN THE ACCUMULATION OF CAPITAL THROUGH TRANSFERRED TECHNOLOGY

We have hitherto argued that power to resolve conflict in favour of any one of the three relevant parties relates to the ability to control accumulation. This involves control over the supply of inputs, control over the transformation of these inputs into products and the disposal of this output. Conflict arises in each of these three aspects

of accumulation. Conflict, however, is not confined to accumulation and also centres around the distribution of benefits arising from accumulation and other general policy considerations of each of the three parties. But in the case of these latter considerations, the power to resolve conflict stems from control over accumulation.

Streeton (1973) lists a number of issues of potential conflict, but warns of the dangers in presenting a 'laundry list' in an analytical void.[7] It is hoped that the ensuing discussion avoids these pitfalls. An attempt was made in the earlier section to situate power in an analytical context. In this section, potential conflict will be related to this earlier discussion and will be discussed in five sections. These are: the availability of inputs, the transformation of these inputs, the disposal of output, distribution of surplus and other sources of conflict.

The Availability of Inputs

Source of Finance for Accumulation: Considerable evidence has been accumulated to show that one of the primary aims of the technology-suppliers is to minimise future cash outlays to a subsidiary particularly where the host currency is likely to depreciate. (31) As a result, strenuous efforts are made to obtain domestic sources of finance for accumulation. Vernon estimates that on a worldwide scale, U.S. multinational corporations' subsidiaries obtain roughly 25 per cent of resources from the parent, 30 per cent through reinvested profits from the subsidiary and 45 per cent is raised from local credit sources. As one of the primary reasons for local-borrowing is to protect against currency depreciations and other risks, and investments in underdeveloped countries are altogether more risky than those in developed countries, it is likely that the actual gearing ratio in underdeveloped countries is substantially higher than Vernon suggests.

> The result therefore is that there has been a substantial overestimation of the contribution of the technology-supplier of the finance necessary to enable accumulation. When this gearing is allied to potential overestimation of the value of capital-in-kind and capitalised know-how,

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7. The approach of listing under various headings the merits and drawbacks of the MNE [i.e. multinational enterprise] (which might be described as the laundry list approach) is common but unsatisfactory. What would be more satisfactory is an analytical framework in which these various possibilities are accommodated, possibly classified according to relevant criteria, and then filled with empirical, quantitative content. (39, p. 4)

there is likely to be substantial areas of conflict between the supplier and the recipients of technology with regard to the provision of finance for accumulation.

Access to Local Credit: We have seen (8) that the interest of the technology-supplier lies in increasing the extent of local borrowing in both capital and operating expenditure, particularly in an economy with a depreciating currency. To the extent that there is a savings gap in the economy, this is in conflict with the interests of the host-state and host-partner, for it means that there will be less credit available for domestic entrepreneurs or the host-partner in its other activities.

Because of the security which the technology-supplier is able to offer as a backing to its borrowing, and because it has access to sources of credit not available to local entrepreneurs, credit facilities are frequently pre-empted by the suppliers of technology. Not only are these resources pre-empted, but this credit is often obtained on preferential terms, so that local borrowers are put at a disadvantage in relation to the foreign-based suppliers of technology. This phenomenon is a problem to the host-state if the social rate of return of these resources is higher in an alternative project. But even if this is not the case, the host-state may nevertheless be pressured to act by the local bourgeoisie which would like command over these resources.

Price of Inputs: Allied to control over the source of inputs is conflict over the price of inputs. In some cases, the firm demands absolute control over the source of inputs as a means to pricing inputs in such a way to allow for the repatriation of surplus in a disguised form.[9] There may, in addition, be conflict over the pricing of domestically procured inputs such as water, electricity, coal and so on.

Another major source of conflict may arise with respect to payment to labour. Technology transferred from developed countries tends to be relatively capital-intensive. In addition it is often utilised within an uncompetitive market structure. As a result in order to avoid conflict with labour it may be in the interests of the technology-supplier to pay high wages and salaries to local employees and pass these higher costs on to consumers. That is, with little real cost to the technology-supplier, its

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9. This concerns not only the overpricing of intermediate inputs, but also the capitalisation of know-how and the price charged for capital good inputs.

continued operation and expansion in the host-country may be backed by a 'loyal and co-operative' work force. By contrast the host-state may (although it seldom does) have an interest in ensuring that local wages are not too high, as these high earnings are a further inducement to urbanisation and uneven development in the country.

Transformation of Inputs

The Rate and Type of Accumulation: We have suggested so far that power to resolve conflict is related to accumulation which takes place in both the underdeveloped and the world economy. Particular interests may vary widely here - for the major oil producing countries, for example, the expressed interest is to keep the oil in the ground, while the extracting companies are concerned to increase the flow of oil. This is in contrast with the situation which existed in the Zambian copper mines in the late 1960s: in this case it was the companies which were less keen to accumulate and to expand output than the host-state.

Similar problems arise in the manufacturing sector. This is particularly the case where a particular subsidiary, while its output may be competitively priced in the world market, is not the lowest-marginal-cost producer in the multinational corporation.[10] The host-state or host-producer may therefore wish to expand production through new capacity to enable exports, while the technology-supplier may be satisfied to install only that equipment which is necessary to serve the home (or regional) market.

Conflict arises not only with regard to the rate of accumulation of technology required to produce a particular product, but also with regard to the type of accumulation which is to take place. One of the major areas of conflict which emerged in the nationalisation of the Zambian copper mines was the use to which investible resources could be put. The Agreement provided an effective veto to the companies (whose equity shareholding fell from 100 per cent to 49 per cent) in this respect: it was specified that reinvested profits

10. For example, if the world price of generators is £100, the cif cost in an Indian subsidiary is £90 and that in a German subsidiary of the same firm is £88, then the firm will obviously prefer to expand output in the German, rather than the Indian subsidiary, even though the latter is producing generators below the world price.

were to be confined to the mining sector and effectively enabled the minority directors to specify that all profits should be remitted as dividends rather than reinvested in new equipment. The financing of subsequent expansion therefore had to take place from external borrowings.[11]

This conflict may concern not only the type of product which is to be produced but also the type of technology which is used to produce these products. In some cases (where, for example, the technology-supplier requires interchangeability of output between subsidiaries), it is the multi-national corporation which wants to use the most modern equipment to produce a sophisticated product. In other cases (particularly where the transfer is to enable import substitution, where the technology-supplier wants an outlet for used machinery and no threat to established export markets), it is the multi-national corporation which may want to use less modern equipment.

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11. Kenneth Kaunda (24). In the Articles of Association of the newly formed companies, the minority shareholders' directors ('B' directors) where given the veto over:

> the engaging by RCM or NCCM in any business or activities of a nature substantially different to the mining companies take over, or the expenditure by RCM or NCCM of any funds not in the ordinary course of its business, or the making of any financial commitments in respect of any new mining operation or facility or the expansion of an existing mining operation or facility in respect of which commitments or expansion RCM or NCCM is unable to raise such monies as may be required on commercially competitive terms or in respect of which the 'B' directors are not satisfied of the commercial validity.

Level and Composition of Output: The international context within which a transfer is made is an important determinant of the conflict over the level and composition of output. The types of conflict which may emerge in this context are complex. With regard to output, there may be conflict centring around the existence and size of exports. Or the conflict may arise in the context of the technology-supplier's broader international interests. In the case of copper production in Chile, the host-state was for many years unable to persuade the companies to expand output, despite a series of incentives. It was only when the international operations of these firms provided a requirement for a greater flow of copper, that they agreed to expand output. (13)

There may also be conflict with regard to the nature and quality of output. The usual case arises when the technology-supplier specifies a higher quality and more sophisticated product than the market demands. There may be three reasons for this action. Firstly, as in the case of the Cummins venture in India (2), the technology-supplier may require interchangeability of output between various world-wide subsidiaries.[12] Secondly, it may be in the interests of protecting its brand names, or as a conscious element of a product differentiation policy, for the technology-supplier to specify this type of product. Or, thirdly, the nature and training of managerial staff may be a factor influencing the quality of output: in Kenya, for example, a company makes shoe-polish tins to a more strict specification than those made in its U.K. subsidiary, because the shoe-polish manufacturing firm in Kenya specifies a need for these tins, even though there is no particular call for such carefully specified tins in the Kenyan market.

Maintenance of Technological Monopoly: The transformation of inputs into final output frequently requires the use of imported technology. The proprietary rights over this technology are generally owned by the technology-supplier and it is this which is commonly the basis of its power. It is consequently in the interest of the technology-supplier to maintain this monopoly position so that it may continue to control conflicts which arise.

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12. Vaitsos gives as an example of this type of product a Volkswagen door.

In order to maintain this control in situations of conflict, the technology-supplier seeks to maintain its monopoly over technological change. This is basically ensured in two ways. Firstly the inventive process is centred in the developed countries, and particularly in the country of the head office. The underdeveloped country subsidiaries perform few institutionalised inventive activities: those they do perform tend to be predominantly of the 'trouble-shooting' variety. As a result, the process of skill formation in underdeveloped countries is centred on operational skills (for example, supervisory), back-up skills (that is, maintenance and repair) and occasionally adaptive skills. More fundamental inventive skills, as we have seen, tend to be centred in developed countries and the underdeveloped country subsidiaries remain dependent upon technical change controlled by the head office.

The host-state and the host-partner, by contrast, may be concerned to break this relationship of dependence. This entails a conflict of interests in both areas discussed above - the situation of, and proprietary rights over, technical change and the generation of local inventive skills.

Disposal of Output

Size and Direction of Exports: As the balance of payments deficit of many underdeveloped countries has increased with continued import substituting industrialisation, so has there been a growth in the orientation of development policies to export promotion. This desire for increasing exports has frequently been in conflict with the interests of the technology-suppliers. This conflict has taken two major forms. The first concerns the size of the export-flows and the second relates to a desire to affect the direction of these exports. The host-state may wish to influence the direction of exports because it may increase the price received for the product, because it may increase the size of potential markets, and because the government may have more general strategic political interests, such as increasing trade with Eastern Europe. The technology-supplier may resist these policies because they stand in conflict with the international competitive

strategy of the firm. As part of this strategy, the head office may have delineated regional 'spheres of influence' to particular subsidiaries, or it may have a lower-cost alternative supplier which can serve the same market to the ultimate benefit of the firm.

Price of Output: The most usual form of conflict with regard to the price of output concerns the transfer of products within a vertically integrated firm. The prices which are used for these transfers are often a major avenue for a subsidiary to receive or transmit financial resources to another subsidiary or to the head office. In some cases the goods which are transferred are freely available on the world market and an 'arms-length' price may be used by the technology-supplier, but in many cases these transfers consist of intermediates which have no established world price - in this case, no arms-length price may exist. Even where arms-length prices do exist for a product, the level of detail of each transfer may ensure that the host-state and partner have no effective access to knowledge of this price.

Distribution of Surplus

Dividend Policies: Closely allied to potential conflict over the rate of accumulation and the source of surplus for accumulation is policy on dividends. The evidence to hand suggests that the interest of the technology-suppliers is frequently to cut down the payback period. Baranson (2), in his investigation of the joint venture between Cummins Desel (a U.S. firm) and Kirloskar (an Indian firm), cites one of the major conflicts in a conflict-ridden venture to have been policy over dividends - Cummins wanted an early return on capital invested, whereas the Indian partner was primarly interested in growth.

A similar conflict of interest is shown in the case of the nationalisation of Zambian copper mines. Compensation was based on the book value of the assets at the end of 1969, with repayment spread over 12 years in one case and 8 years in the other. In the event, however, of a sharp rise in the price of copper, repayment was to be speeded up.[13] This would bear out the assertion which Baranson makes in

13. It is interesting to note that there was no provision for a slowing down in the repayment of dividends in the event of a sharp fall in the price of copper.

that the mining firms preferred a short payback period and were restrained in the initial agreement by the low price of copper.

This leads us to a clear conflict of interests in dividend policy. Given the high discount rate which tends to be used by the multinationals, it obviously makes sense to receive dividends as soon as possible, even at the sacrifice of total undiscounted profits. Because of the low rate of time preference which it often uses, the host-state (but less seldom the host-partner) would more likely opt for greater total undiscounted profits, even though their dividends may be spread over a longer period of time.

Foreign Exchange Repatriation: In a hypothetical situation of no risk and no uncertainty, with an equal rate of inflation and technical change in all economies, there would be no preference for holding current assets in any particular currency, other than that of convenience. But, clearly, the real world is far removed from this hypothetical example.

For the technology-supplier the major problem concerns risk and uncertainty. There are two strands to this problem. The major problem, particularly in recent years, concerns the depreciation of the host currency. If there is a positive current-asset balance in the host country, devaluation of the host-currency will lead to a fall in the present worth of the subsidiary in the head office's unit of account. Conversely, if there is a negative current-asset balance in the host-country, devaluation of that currency will lead to an increase in the present worth of the subsidiary in the head office's unit of account. Given that underdeveloped countries are often characterised by a depreciating currency, the policy of the technology-supplier is thus to repatriate earnings as soon as possible and to increase local borrowing to avoid the risk of devaluation.[14] For the host-state, the interest clearly lies in delaying and minimising the outflow of foreign exchange as devaluation will increase the foreign exchange value of a debt negotiated in local currency by the technology-supplier and, at the same time, reduce the foreign exchange cost of repatriated earnings.

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14. See the discussion on sources of finance for accumulation above.

The second problem of the technology-supplier arises from the risk of committing resources to an underdeveloped country where a changing political structure may affect the reliability of returns from the subsidiary. Once again the logical answer to this problem lies in speeding-up the repatriation of foreign exchange, and in insuring against this risk in other ways (such as referring disputes to an outside arbitrator.)[15]

The recipient underdeveloped economy is frequently characterised by a shortage of foreign exchange. The degree of this problem may range from the mild (e.g. Kenya) to the extreme (e.g. Sri Lanka), but in all cases the policy conclusion for the host-state is to attempt to delay and minimise payment of foreign exchange, particularly where foreign debts are negotiated in the local currency. Although there are a wide range of feasible policies to attain this goal (such as the ceiling on profits which the Colombian Government attempted to enforce after 1968), there is a considerable body of evidence which suggests that the technology-suppliers are able to circumvent these regulations with a great deal of success.[16]

We are faced here with a clear conflict of interests between the technology-supplier and the host-state. Not only is it one of the most often expressed conflicts, but the very act of resolution by the technology-supplier has the effect of increasing the severity of the conflict. That is, since the likelihood of devaluation depends upon the balance of payments deficit, and since this deficit is partly a consequence of the actions of technology-suppliers to protect themselves against devaluation, a vicious circle is established through both parties acting in their own interests.

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15. This policy will be discussed in greater detail later in this paper.

16. We shall discuss this problem in a later section on transfer-accounting.

Tax Payments: There are a variety of taxes which the host state can use to increase its share of the surplus which is generated through accumulation. The most general form of tax relates to profits through corporation tax,[17] but this can be supplemented by a variety of other taxes on output (e.g. the old Zambian Minerals Tax), imports (i.e. tariffs), exports and so on. These vary with specific circumstances: for example an export tax may be imposed when the country has a virtual monopoly over the supply of a product.

To the extent that these taxes can be used effectively to increase the share of the host-state, this may be an important area of conflict. But, as we shall see in a later discussion on transfer accounting, there are a variety of mechanisms which the technology-supplier can use to avoid and evade these tax payments. The success of this transfer accounting can be gauged from the empirical studies on the motivation of foreign investment, which invariably conclude that investment in underdeveloped countries is seldom affected by government policies of providing tax holidays, and so on. Thus Streeten concludes: "There is almost universal evidence that foreign investors say that tax concessions and pioneer status play no or only an insignificant part in bringing them to the country." [18]

The Burden of Joint Venture Costs: When the technology-supplier is engaged in a joint venture with the host-state or host-partner, conflict frequently arises with regard to the burden of costs. There are two basic costs here. The first is infrastructural costs which are generally born by the host-state, typically these include the construction and improvement of transport networks, capital expenditure on the provision of water, electricity and so on. There is unlikely to be extensive conflict with regard to the burden of infrastructural expenditure, although it is sometimes argued that effective profits are high enough to enable the technology-supplier to bear these costs. Presumably the 'correct' answer would be to more effectively tax these excess profits and use this revenue to fund infrastructural costs, rather than to expect the technology-supplier to make these expenditures itself.

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17. The size of this tax is affected, inter alia, by the type and extent of depreciation allowances.

18. Streeten, (39), p. 10. See also Aharoni, (1). There are some exceptions to this, such as Puerto Rico and Ireland, which are well placed with respect to large export markets (i.e. the U.S. and the E.E.C. respectively).

The second type of cost is the provision of inputs. Here there is more likely to be extensive conflict. The general form of agreement is not so much that the host-state or host-partner actually provides inputs such as timber, land and water free of charge, but that the technology-supplier is granted access to these resources at a 'subsidised' cost. That is, if these same resources were to be used in an alternative way, the supplier of these inputs would obtain a higher return on the resources.

Thus Girvan concludes in relationship to bauxite mining:

> Another noteworthy point about special agreements (with regard to exploration rights) is that they provide for the accessibility not only of bauxite but of other natural resources as well. In a large number of cases the companies are given a carte blanche to use from Government lands in their concession area, such resources as water, timber and sand and gravel which may be needed in the operation associated with exploring the bauxite. (14, p. 395)

Other Sources of Conflict

Attitude to Domestic and Foreign Competition: The extent to which the technology supplier is operating in a non-competitive market largely determines the effective profit which arises from the transfer. The interest of the supplier is therefore to create a monopolistic structure. There are a number of ways in which this can be done, three of which are more generally used. The first of these is to negotiate with the host-state or partner exclusive rights to a given operation. This may be exclusive exploration and production rights for the provision of a particular input,[19] or it may be the exclusive right of producing that commodity in the country. The second avenue is to negotiate a tariff structure with the host-state which on the one hand provides a high level of effective protection against foreign competitors, and on the other reduces the tariffs on imported inputs used by the technology-supplier. Finally, the technology-supplier may act as a product differentiator. Through heavy expenditure on advertising, a brand-name loyalty is created amongst consumers and the technology-supplier thereby operates in a non- (or less) competitive market structure.

By contrast, the interest of the host-state may lie in increasing the competitive nature of the market, which may result in lower profits and unit prices. The host-partner's interests may lie in either direction. On the one hand it may be closely tied in with the technology-supplier and

19. As in Vaitsos's investigation of the Colombian pharmaceutical industry.

may receive a share of total effective profits: in this case its interests also lie in reducing the competitive nature of the market. Or, on the other hand, the host-partner may be a potential competitor to the technology-supplier, in which case its long-run interests lie in increasing the competitive nature of the market.

Development Policies: Conflict may also arise in relation to general development policies which the host-state may wish to pursue. There are a wide variety of policies which may conflict with the interests of the technology-supplier. The major ones concern the generation of employment, the appropriateness of technology used, the attempt to formulate a less uneven path of development, the attempt to change international political alignments and the attempt to obtain what President Kaunda called 'economic independence'. (quoted by Faber and Potter (11))

In most cases, these general strategies may not directly influence the operation of the transferred technology (although this is less true of policies designed to increase employment). But the technology-supplier may perceive that its long run interests are threatened by the general orientation of these policies. In the extreme case, as for example in I.T.T.'s recent involvement in Chile, the technology-supplier may become an instigator and active political participant in the domestic political structure. In the less extreme cases too, however, the combined actions of technology - suppliers may have an important effect on the orientation and success of these development policies.

Backward and Forward Linkages: Theories of industrialisation in underdeveloped countries place a great deal of prominence on linkages which result from transferred technology. (See, for example, Hirshman (18).) The idea is that either by providing inputs for a plant, or through the stimulation of local processing or finishing activities, the process of industrialisation may be stimulated through the use of transferred technology.

There is some reason to doubt the extent of the linkages which result from this transferred technology,[20] for the interest of the technology-supplier may lie in limiting the extent of these linkages. This may be for three reasons. Firstly, one of the main avenues for the repatriation of surplus may lie in the transfer - pricing of inputs from the technology-supplier. Or conversely, there may be 'hidden' external economies, such as those reported

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20. See, for example, Langdon's study on the production of detergents in Kenya (25).

by Girvan where the empty returning ships used to transport copper from Chile were owned by the copper companies, thereby leading to low real costs of transport for the firm when importing. (13) Where linkages do occur, this may often involve foreign rather than local entrepreneurs.

Secondly there may be more obvious external economies arising from the transferred technology which the technology-supplier wishes to internalise to the firm. Kaiser Aluminium, for example, has made a major diversification into chemicals based on the processing of Jamaican bauxite. Presumably that diversification could have been made in Jamaica, rather that the U.S.A., had Kaiser Aluminium so wished.

Thirdly (and this partly explains the reason for Kaiser's diversification in the U.S.A. rather than in Jamaica), there will almost certainly be greater risk and uncertainty, with decreased flexibility, for investment in an underdeveloped country. It is this last factor which goes a long way to explain the seeming paradox whereby firms incur higher transport costs by shipping minerals and agricultural products produced in underdeveloped countries to developed countries for processing.

Arbitration

Agreements between technology-suppliers and the host-states or host-partners are generally associated with a mutually agreed structure of arbitration in the event of major conflict arising in the operation of technology. There are three potential areas of conflict here.

The first concerns the situation of the body responsible for arbitration - is it a domestic or a foreign party? The second issue of conflict relates to the nature of the legal framework to be used in the arbitration. In some cases as we shall see later, the technology-supplier has been able to negotiate an agreement which effectively 'freezes' the executive powers of the host-state at the time at which the agreement was signed. In other cases, foreign law is considered to be relevant to the dispute. The final issue concerns the penalty which is to be exacted for breaking the agreement.

As we have seen, the extent to which control is wielded by either party reflects the balance of power in the agreement. But relative powers change over time and the balance of power in the agreement may alter. It is in the interests, therefore, of that party which is most likely to lose its relative power over time to freeze the agreement and increase the costs of reneging on the contract. It is in the case of low-technology sectors, such as (on-shore) petroleum extraction, mining and some services, where the relative power of the host-state and partner is most likely to grow over time, that we find these three elements of conflict most clearly specified. Where the balance of power is unlikely to change significantly, or 'unfavourably', there is little need for these steps to be taken.

MECHANISMS FOR THE RESOLUTION OF CONFLICT

In earlier sections of this discussion we have considered the nature and source of power in the transfer of technology and a series of potential conflicts which may arise between the supplier and recipients of technology. Ultimately, as we have seen, control reflects the power of the dominant party in the transfer. What we are now concerned to show is the avenues through which this control may be exercised.

There are two basic channels through which control may be exercised. The first channel for the exercise of power lies in the operation of the technology. Particular aspects of this control are financial control, organisational control, entrepreneurial control, managerial control, control over manpower and control of innovations. The second channel is the set of host-state policies which attempt to circumscribe the power and behaviour of the technology-supplier and host-partner. These policies can be divided into those concerning resource accessibility, those concerning operational conditions and those concerning the payment stream. (14)

Control over the Entrepreneurial Function

The primary area of importance in the exercise of control is control over the entrepreneurial functions of the enterprise. This follows from the earlier analysis in which it was argued that power was derived from control over accumulation. By this is meant control over decisions which affect the nature, level and rate of accumulation.

The basic instrument whereby this control is exercised is through the capital budget. In a recent visit to a subsidiary of a large international firm which serves as a regional headquarters for the firm and is itself expanding at a very rapid rate, I was informed that the subsidiary was unable to make any capital expenditure in excess of approximately £1,100 (Sterling) without the prior authority of the head office. This enabled the head office of the firm to maintain control at a very detailed level with regard to the size and nature of future investment. This carefully specified control measure is being used in a firm which is noted for the independence which is given to its subsidiaries. For example, none of the subsidiaries in the region was limited in any way with regard to the direction and size of its exports.[21]

Schulman makes much the same point, although he places greater emphasis on control over recurrent expenditure: "Budgeting is the basic device used by the firms in this study for control of operation.... Budget manuals or instructions are issued well in advance of budget dealines." (36 , p. 86) Robbins and Stobaugh argue in relation to the evaluation of subsidiary performance by the head office that the primary means of control is over the investment budget and that these decisions are frequently approved at the highest level. (33, chapter 8) Brooke and Remmers are in accordance with this view as well: "Control over investment represents the ultimate control over the operations of a subsidiary and, as such, is almost always closely held at Head Office." (6, p. 105) Finally, a U.N. study on the multinationals points out that even in the most loosely knit international firm the minimal control or restriction which is exercised is control over the capital budget. (42)

The evidence cited above accords with the argument that control is primarily rooted in accumulation. But control over investment in plant and equipment is only one area of control over the entrepreneurial functions of the firm. The second primary area is an attempt at control

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21. Although it should be noted that the output of the firm had high unit transport costs in relation to total unit costs, there was active competition between subsidiaries for export markets.

over accumulation by competitors. There are many elements to this competitive strategy. One head office policy is to obtain exclusive rights over property necessary for accumulation and, without using the rights, to pre-empt accumulation by competitors. Thus, for example, we have the non-utilisation of exploration rights over 16,000 square miles south of the Zambian Copperbelt. A second example would be the non-implementation of patents over certain production processes.[22]

Another strategy for controlling accumulation by competitors is product diversification which builds up a strong loyalty amongst consumers for one's own product. This may have an additional advantage of providing scale economies:

> Firms that emphasize marketing may be able to protect themselves by raising the price of entry to their markets. The initial expenditures required by a potential competitor to gain brand acceptance may be very high, and the absolute amount of money spent on advertising is likely to be an important barrier to entry. The firm that can spread its expenditures on the creation of a brand image across a number of products may take advantage of scale economies. The large advertiser may get reduced rates that are an additional barrier to a new entrant. (40, p. 54)

This control over product differentiation is frequently exercised by the head office. Thus, for example: "Pepsi-Cola sells exactly the same product in all its numerous national markets and uses the same advertising and promotional themes in all of them." (40, pp. 56-7)

One final area of control in the entrepreneurial operation of the enterprise lies in the relationship with the host-state. This relationship is generally of great importance in future accumulation by the firm, and it is thus necessary for the negotiation to be handled by the head office. Thus where substantive conflict or negotiations are required the subsidiary almost always refers to the head office for guidance or detailed assistance. This is true of transfers through a joint venture, although here the technology-supplier may be constrained by the presence of the host-partner. More often, though, one of the main reasons for entering a joint venture may be that the presence of the host-partner eases the relationship with the host-state.

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22. C. Vaitsos, (44). A particularly clear example of the use of patents to block accumulation can be found in the case of the Chilean Copper Mines. As soon as the host-state nationalised the mines, the firms registered a whole series of patents designed to block further accumulation in the processing of the ores. Prior to the nationalisation there was little danger of this investment as these decisions were largely controlled by the firms.

Control over Organisational Structure

The degree to which the technology-supplier maintains organisational control over the operation of the transferred technology varies widely. Robbins and Stobaugh argue that the results of their empirical investigation suggest that the major determinant of organisational structure of the multinational corporation is the size of its international operations (and thus, also, its experience in the transfer of technology). 'Small firms', that is those firms with overseas sales of less than $100 million, tend to allow foreign subsidiaries to operate independently. In this case, formalised control measures are confined (as we have seen) to the investment decisions. In the 'medium sized firms', that is those with international sales of less than $500 million, many of the subsidiaries' operations (particularly their financial operations) are handled by a large head office staff. 'Large firms' are faced with both the advantages of centralisation and the necessity for local autonomy. In this case, the head office tends to issue guidelines, co-ordinate activities and monitor results, in addition to holding a firm control over capital expenditure. In this latter case, control is exercised through the rule book. (33, chapter 3)

The use of these rule books, often using the currency of the head office country, is a widely used control measure. For example, the African subsidiaries mentioned above were obliged to provide monthly reports on many facets of their operations to the head office. This control over the organisational functions of the subsidiaries enabled the head office to control the international strategy of the firm as a whole, and thus also the strategy of particular subsidiaries.[23] In the sample of firms examined by Brooke and Remmers, almost all of the subsidiaries were obliged to provide detailed reports to the head office at least on a quarterly timetable. (6, chapter 4)

The degree of organisational centralisation discussed above must be distinguished from the organisational structure of the technology-supplying firm as a whole. At one extreme, some international firms produce single lines in a few countries, at the other, firms produce many lines in many countries. This product and geographical dispersion, linked with the size of the firm's international operations, leads to different organisational

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23. A rather interesting result of these quarterly reports used by this particular firm is that the head office used these subsidiary reports to estimate future investment needs for the firm as a whole. However, there was a systematic bias towards overestimation of capacity in subsidiary reports and the firm reached a point where it was short of actual capacity to meet consumer demand, even though on paper it was well able to meet this demand.

structures. The former type tend to be characterised by functional structures - that is the constituent organisational parts of the firm are concerned with sales, production, financial control, etc. In the more diversified firms, the basic organisational units are divisional - that is, they constitute product or geographical divisions, and within each of the divisions the functional operations are co-ordinated. (40)

The relevance of organisational control is that, given the need to balance the advantages of centralisation against the advantages of decentralisation, the particular organisational structure which is created in a complex, diversified firm will be that which best enables the head office to maintain control over the important areas of potential conflict in the operation of the technology.

Control over the Financial Function

There are three basic areas of control within the financial function of the firm. These are with regard to capital expenditure, recurrent expenditure and foreign exchange remittances. Since we have already discussed control over capital expenditure in an earlier section, we shall be primarily concerned here with the latter two. With regard to control over capital expenditure it is only necessary to add that the primary instrument for control over both capital and recurrent expenditure of a subsidiary is the budget. Particularly with regard to capital spending, detailed guidelines are provided by the head office specifying the frequency, type and level of detail with which the subsidiary's budgets have to be sent to head office for approval.

Recurrent Expenditure: Once the important decisions with regard to accumulation have already been made, the subsidiary tends to have a fair amount of latitude with regard to recurrent expenditure. The primary control mechanism used here is the performance of the firm, which may be measured by a number of criteria such as profit on sales, profit on total assets and so on. The problem of monitoring this performance is compounded for the firm by the use of transfer accounting techniques which are designed to mis-state the real value of flows. Many firms resolve this by the use of two (or more) sets of books: one for internal use, one for the host-state, one for the

host-partner and so on.[24]

Foreign Exchange Remittances: This is one of the most prevalent and critical areas of conflict in the transfer of technology. We have already seen that because of the wide-spread existence of controls on the remission of foreign exchange and the likelihood of currency fluctuations, technology - suppliers have a strong interest in maintaining control over the repatriation of foreign exchange. Similarly, because of the frequent and critical foreign exchange gaps, host-states also have a strong interest in controlling the remission of this foreign exchange.

The primary means of control for the host-state lies in the areas of policy formulation and specific agreements with the technology-supplier. For the technology-supplier the primary mechanism of control over foreign exchange remittances lies in transfer accounting, a factor which we shall now discuss in some detail.

The relationship between technology-suppliers and subsidiaries, host-partners and host-state is characterised by a multifarious flow of goods and services from one party to another which is counterbalanced by a returning flow of payment. In many cases the goods and services which are transferred in this set of relationships are readily available from a number of suppliers and have an easily obtained international price (e.g. dopper). Intra-firm or intra-partner trade may thus be easily conducted at these 'arms-length' internationally-determined prices. But "... it is often extremely difficult... to estimate a true arms-length price for the type of goods moving between members of a multinational system. And in the case of royalties and management fees the problem may be insuperable." (33 p. 185) This means that an agreed price must be determined for the payment of these goods and services. The practice of using these 'artificial' prices may be termed transfer accounting.

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24. Schulman found in his empirical investigation of transfer pricing that a number of the sample firms resorted to the use of alternative sets of company books.

This transfer accounting refers to both goods and services. In most cases it refers to the price charged for the intra-firm transfer of goods, but it also refers to charges against services such as interest, royalties, technical and management fees, overhead and administrative charges.

The potential complexity of this transfer accounting process is staggering. Robbins and Stobaugh illustrate this by pointing out that if there exist ten forms of interchange between each subsidiary in the firm, then a firm with two subsidiaries may have ten links, a firm with three subsidiaries thirty links and with 25 subsidiaries 3,000 intra-firm financial links.[25]

There thus exists considerable scope for the use of transfer accounting to remit profits in the transfer of technology, particularly when these transfers take place within the same corporation. There is no firm evidence of how wide-spread these practices really are, although we do know that in a series of particular circumstances[26] it does occur at a very significant level. In some of the literature there is the assertion that these practices are not widespread. Robbins and Stobaugh, for example, suggest that they are most likely to exist in the case of 'medium sized' firms,[27] as the large firms "tend to establish uniform policies that involve standard mark-ups", (33, p. 91) and "The small company, relatively new in the international field, often is not in a position to worry much about intercompany pricing practices." (33, p. 92) Vernon refers to Vaitsos's well-known work on Colombia by suggesting that it is probably atypical: "The data, therefore, may simply represent evidence of the fact that when governments want to limit the level of profits taken by multinational corporations, they may succeed in affecting only the form in which the profits are taken and not their size." (46) Finally, Horngren, in his basic accounting text book, suggests in the absence of arms length prices the use of a series of transfer prices, none of which seems to be based on the sorts of considerations suggested by Schulman (36), Chudnovsky (7), Murray (forthcoming), Vaitsos (44) or Girvan. (12) A set of text book prices, apportioning costs and rewards in relation to subsidiaries' contributions, is suggested by Horngren.

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25. One of the firms in their sample had 500 separate subsidiaries.

26. Most notably, see Vaitsos (43), Murray (forthcoming) and Chudnovsky (7). Chudnovsky estimates that if account is taken of the use of transfer pricing, the effective profit of thirteen firms in Colombia rose from 16.4 per cent (which was declared) to 44.4 per cent.

27. That is with international sales over $100 million and less than $500 million.

A major constraining factor on the prevalence of these transfer accounting techniques is argued to be the policies of the governments of the technology-suppliers. The U.S. Internal Revenue Service "requires arms length prices - prices that would be charged to an unaffiliated party for all goods and services provided by parents to its subsidiaries and vice versa". But even in these cases, "as the technical know-how and management services provided by one unit of a multinational enterprise to another usually are unique items without a market value, there is no exact arms length price applicable to such transaction". Because of these and other problems, "in practice...the enterprise has a certain amount of leeway in setting prices", (33,pp. 88-9) even vis-a-vis the developed country governments. It is likely, therefore, that in the case of the transfer of technology to underdeveloped countries the use of transfer accounting techniques may be an extremely widespread method of remitting foreign exchange earnings. This contention is borne out by the evidence of empirical studies cited above. It is important to list the reasons why the technology-supplier may be concerned to manipulate transfer accounting techniques in an attempt to repatriate foreign exchange. Briefly these are:

(1) To obtain a larger share of profits from a joint venture;

(2) To speed up the flow of funds in order to avoid the risk of currency fluctuations; [28]

(3) To ensure an appropriate flow of funds in the light of its needs to maximise the cash flow from a transfer at any particular point in time;

(4) To avoid or to reduce the payment of taxes and tariffs; [29]

(5) To avoid restrictions on profits and remittances;

(6) To maintain competitive advantages, such as when for many years oil companies maintained low profits on refining and distribution and high profits on extractions in order to avoid competition in these spheres; (36)

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28. This is probably the most important reason for transfer pricing nowadays, but is inadequately treated in much of the literature. For a comprehensive discussion of the problem see Robbins and Stobaugh (33).

29. "If T_2 is the tariff rate of imports made by a firm from the parent, and t_2 and t_1 are the income tax rates in the host and home countries respectively, it will be convenient to use transfer pricing only if $T_2 < t_2 - t_1$." Chudnovsky, (7), p. 98.

(7) When there is a policy of a worldwide company price for the product, and high cost subsidiaries need to be compensated for adherence to this price;

(8) In the interests of maintaining good public relations in the host-country; and

(9) To avoid anti-trust legislation.

The extent to which each of these factors will influence behaviour of course varies from case to case. From the empirical studies available we do have some evidence to suggest that it may be a widespread practice notwithstanding the reservations of some, noted above. Of particular importance here is the observation that where profits are small in relation to total intra-firm transfers, a transfer price which is only a small percentage above an arms' length price may lead to a much higher percentage increase in profits. It is estimated for Kenya, for example, that a 1 per cent rate of overpricing of inputs would lead to an increase of 105 per cent in profits, and a 10 per cent increase in input prices would raise profits by 288 per cent.[30]

Control over Staffing

In the operation of transferred technology, the managerial function can be distinguished from the entrepreneurial and operational functions. The entrepreneurial function, as we have seen, concerns the allocation of investment for accumulation, broad strategic policies of the subsidiary and negotiation with the host-state. The operational function is predominantly an engineering one, where responsibility lies in ensuring that production and quality targets are met. The management function ensures the running of the plant in accordance with the directions of the entrepreneurial functions, and is concerned with the year-by-year operation of the plant. It supervises the purchase of inputs, the transformation of these inputs into final product and the disposal of the final product, subject to the constraints of entrepreneurial decision-making and operational difficulties.

The supplier of technology tends not to be very concerned with the recruitment of those who operate the plant. Indeed, because of the political pressure in favour of localisation in underdeveloped countries, and

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30. I.L.O., (22), p. 455. Logically a percentage increase in the price of final goods will have a greater effect on profits than the same percentage increase on any input.

because of the lower cost of local labour, the technology-supplier, host-partner and host-state have a common interest in localisation. However, with regard to the entrepreneurial and management functions, the technology-supplier has a strong interest in controlling these decisions as they are important areas for the exercise of control. This is done in two ways. Either the staffing lies in the hands of the technology-supplier, or, where local manpower is used, strenuous efforts are made to incorporate local staff members into the 'family' of the firm, so that their decisions will not be at variance with the interests of the firm as a whole.

There is considerable evidence that managerial and entrepreneurial functions are primarily staffed by home country personnel or manpower from other developed countries. For example, " a survey [of U.S. multi-national corporations] conducted turned up nineteen foreigners in the group, of whom fourteen were Canadian or British". (45) Girvan, in his survey of the bauxite industry also finds strong evidence to suggest that the technology-suppliers try to keep the right to reserve a significant number of managerial positions for expatriates. (14)

Where local managerial manpower is recruited, attempts are made to integrate this staff into the management ethos of the technology-supplier. One of the ways in which this is done is consciously to attempt to replicate the life-style and interests of the departing expatriates by paying salaries equal to or greater than those of departing expatriates. (22, 25, 15)

Another way is to organise an interchange of manpower between various international subsidiaries to induce a corporate perspective and responsibility. The result of these pressures is that when a conflict of interests emerges between the technology-supplier and the host-state, the locally recruited managerial staff see their primary responsibility as lying with the technology-supplier and not the host-state.

Control over the Inventive Function

The process of invention is crucial to continued accumulation. Since control over accumulation is of primary interest to the technology-supplier, it is logical that organised inventive activities are closely controlled by it. There are two ways in which this is done. Firstly, major research is performed in the home country, and secondly, where invention does arise from operations in another country, ownership of and control over this technical change is held by the head office.

Research in the underdeveloped country subsidiary is primarily of the trouble shooting variety. More fundamental research into new types of product and process or cost reducing techniques is generally confined to the developed countries and to the home country in particular.[31] The subsidiaries stand as recipients of technical change: subsidiaries of the Metal Box Company, for example, receive a monthly list of technical development from the head office. These technical developments are the results of research done in the U.K. research centre as well as those communicated from other subsidiaries. All proprietary rights over technical change occuring in any subsidiary are vested with the head office and are therefore under its control. This is a common system and helps to explain the technological dependence of underdeveloped countries.

INSTRUMENTS OF CONTROL

There are a wide range of instruments which the head office of the technology-supplier is able to use to enforce its power at the subsidiary level. Some of these controls are formally specified, and other operate at the non-formalised level. Vernon sums up the position with regard to wholly-owned subsidiaries effectively:

> When a parent expects to control its subsidiary effectively, formal restrictions are redundant; where they exist, the motivation is partly or wholly to ensure against the possibility that the parent may one day lose control of the subsidiary, through expropriation or otherwise. As long as control is secure, however, a rational parent will not hesitate to use the wholly-owned subsidiary for any purpose - consistent or not consistent with the restrictions - provided that the use contributes to the strategy of the system as a whole. (46)

The position vis-a-vis joint ventures or management contracts is different in the sense that controls have to be more carefully specified, due to the greater likelihood of conflict with the host-partner or host-state. In this case, it is in the interest of the technology-supplier to freeze the initial balance of power to avoid the risk of decreasing relative dominance over time. In these circumstances it is more usual to find that the instruments of control are carefully specified in the agreement, and a lesser reliance by the technology - supplier on 'informal' control instruments.

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31. There is however an alternative view on this issue which suggests that as a result of trouble shooting research, subsidiaries in underdeveloped countries obtain the same sort of technical progress which results from more formalised research programmes at the head office. J.M. Katz, (23).

We shall be looking at four types of formalised instruments of control in the transfer of technology, aware though that in wholly-owned subsidiaries, control may be exercised without necessarily being formalised. The first of these instruments is the use of specific contracts, such as management, sales and purchase contracts. The second instrument is the memorandum and articles of association of the joint venture, and the third instrument is the use of restrictive clauses. The fourth instrument concerns the legal status of the agreement. In the case of the first two instruments, the discussion will take the form of an examination of a joint-venture agreement in Zambia between the host-state and the Anglo-American Corporation.

Agreed Contracts

Management, purchasing and marketing contracts vary in their scope with the technical knowledge and managerial capability of the host-partner and the host-state. We shall be examining a representative set of management, purchasing and marketing agreements agreed between the Government of Zambia and the Anglo - American Corporation, following the partial (51 per cent) nationalisation of Anglo's copper operations in Zambia in 1969.

The Management Contract: (48) The general duty of the management in this exclusive contract was "towards the general management of the Company's business and specifically directed towards the optimisation by the Company of the production and profit". No specification was made if there should prove to be a conflict between output and profit[32] in the operation of the mines. The Company had the right to appoint the Managing Director. As part of the agreement Anglo was to provide technical services which inter-alia include "capital expenditure estimates"; short and long term plans, viability studies and the like for maintaining, expanding or improving operations and production; advice on "operating problems" and "the scheduling of copper production"; advise on "research and development"; and advice on and procurement of technical change.

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32. Easily envisaged in the extraction of variable grade ones.

Anglo had also to provide general and advisory services which required advice inter-alia, on production and marketing; preparation of financial statements, reports and accounts; computer and management services; and labour relations. Anglo was also to keep the joint venture "promptly informed of significant developments relating to the mining and production of copper and cobalt throughout the world of which Anglo is from time to time aware and to the extent to which such information is available for release".

"Anglo shall provide or procure the provision of senior staff as may be required from time to time by the Company". Any invention and know-how resulting from the activities of this staff would be available to the joint venture "PROVIDED ALWAYS that the Company ... shall cooperate with Anglo ... in procuring the registration (for Anglo) ... as licensee of all such Invention Rights [emphasis in original]".

A number of things emerge from this agreement which reflected and reinforced Anglo's dominant power in the joint venture. Firstly Anglo controlled the flow of information to the host-state with regard to production, financial flows and technical change. Secondly, Anglo controlled the appointment of senior staff, and thirdly, Anglo obtained the proprietary rights over technical change. In the light of the earlier discussion of areas of control, Anglo was obviously in a strong position, particularly when the management contract is read in association with the articles of association which provide Anglo with control over capital investment.

The Purchasing Contract: (49) In this exclusive agreement Anglo undertook "to negotiate and conclude all arrangements for the supply and delivery of all goods required by the Company and its subsidiaries at the best prices that can be obtained", as well as to arrange transport, insurance and clearing facilities. While this agreement gave Anglo considerable scope for transfer pricing if it so desired, there was an additional clause which allowed Anglo to increase the commission costs if the agreement appeared to result in an "overall financial loss to Anglo"! In the light of the evidence which exists on the use of transfer prices in similar circumstances in other parts of the world, it is clear that control over the financial operations of the joint venture was firmly held by Anglo.

Marketing Agreement: The marketing agreement "appoints Anglo as its exclusive agent in each and every country throughout the world ... for finding purchasers for all ores, metals, or minerals, or any by products ... produced by the Company and all its subsidiaries". The Agreement also allowed for the exclusive purchase of this copper by it or any of Anglo's subsidiaries.

In this agreement Anglo controlled the disposal of the output, particularly insofar as it disallowed access to the product by any of its rivals. One of the more important areas of control - that is monopolistic control over the disposal of a source of raw materials - was thus maintained by Anglo.

The Memorandum and Articles of Association

In this nationalisation the Master Agreement, referred to as the "Heads of Agreement" (47), and the Memorandum and Articles of Association cover much of the same ground. We will therefore confine ourselves to a discussion of the Heads of Agreement (which summarises the other two agreements) in an attempt to show how this agreement, read in conjunction with the contracts discussed above, enabled Anglo-American to exert control over the important decisions in the operation of the technology to mine and refine copper in Zambia.

With regard to the payment stream, the host-state agreed that as long as the twelve-year bonds were outstanding, the mining operations would not be subject to additional "numerous taxes, export taxes, income taxes, royalty payments, withholding taxes or any other revenue measure". No import duties on mining equipment, machinery and supplies above the "average" rate would be levied. No tax would be paid on dividends to any shareholders, as long as the bonds were outstanding. Finally, dividends were remittable free of exchange control at I.M.F. parity rates. Through these sets of arrangements, Anglo was able to control any adverse change in the payment stream and ensure the free repatriation of earnings. Thus two of the major areas of conflict mentioned above had effectively been frozen, and future control - albeit for the period of time for which the bonds were outstanding - remained with Anglo.

Affirmative votes of a majority of the five Anglo directors (out of eleven) were required on a number of actions of the joint-ventures, thereby giving an effective veto to Anglo on any of these issues. These included:

(1) "Any disposal of all or of any substantial part of the assets" - this enabled Anglo to ensure that rival firms did not gain access to the fruits of the operation.

(2) Diversification into any "substantially different" activities - this enabled Anglo to maintain partial control over the use of the surplus.

(3) "Any new mining operation or facility or the expansion of an existing mining operation or facility" which was not commercially viable as judged by Anglo directors, or the ability to raise such funds on "commercially competitive terms" - this effectively enabled Anglo to control any attempt by the host-state to generate external economies.

(4) "Appropriations in respect of capital expenditure or expenditure for exploration or prospecting" other than for operations agreed to by Anglo directors.

(5) "Any act, dealing, arrangement or transaction which, in the opinion of a majority of the "B" Directors, is not directed towards and/or calculated to attain the optimisation of production and profit"-this clause allowed Anglo to control the host-state in its attempts to pursue its own broader strategic interests.

This Memorandum and Articles of Association, together with the managerial, purchasing and marketing contracts discussed earlier can be related to the earlier discussion of the five areas of control. Control over entrepreneurial decisions was effectively wielded through the veto of the Anglo directors on diversification, expansion of production, etc., as well as by the nature of the information which was passed on to the joint

venture in the management contract. At the same time, the marketing contract and the directorial veto enabled Anglo to control the supply of copper to potential competitors, thereby exercising some tenuous control over accumulation by rivals in processing and mining facilities.

Control over the organisational structure of the firm, while not a particularly important area in a joint venture of this type, was once again maintained by Anglo, partly through the veto of their directors, but largely through the management contract which gave Anglo exclusive rights to gather and present operational data to the joint venture.

The important area of financial control rested firmly with Anglo. The payment stream was stabilised; recurrent (and capital) expenditure was limited to "commercially viable" activities not "substantially different" from present operations without Anglo directors' approval; and remittances of foreign exchange were guaranteed.

The staffing of senior positions was controlled by Anglo through the management contract, and some control over the attitudes of senior Zambian personnel was assured by an agreed programme of training in other worldwide subsidiaries of the Anglo - American Corporation.

Finally control over the inventive function was maintained in a number of ways. The management contract gave Anglo the exclusive right to provide technical and engineering services, and provision was also made for the acquisition by Anglo of property rights over the "Invention Rights" which may have resulted from research and development.

Anglo thus managed to obtain comprehensive control over the operation of the technology, notwithstanding the acquisition by the host-state of the majority of the equity. This control followed largely from the lack of manpower and know-how of the host-state. (5, 11) The expectation that the relative power of the host-state over these processes (which are vital for control over accumulation) would increase over time, led Anglo to attempt to freeze the balance of control for the twelve - year period for which the bonds were outstanding.

The preponderance of Anglo control was, however, recognised by the host - state and led the President to declare three and a half years later that the payment of the bonds would be speeded up, thereby freeing the host-state from some of this control. "The effective control of the industry", he declared, "was vested firmly in the minority shareholders".(24) In particular, he continued, this control had enabled Anglo American (and R.S.T.) to obtain financial advantages over the use of foreign exchange and the restriction of taxes. The use of profits had been confined to mining activities, and even this accumulation had to be funded through borrowing, as the firms controlled the use of profits and ensured that these were paid out as dividends, rather than being reinvested. Finally, the management and purchasing contracts had led to the purchase of inputs from "non-resident companies for reasons best known to themselves, but not comprehensible to us".

As a result, three actions were taken in an attempt to switch control to the host-state. Firstly, the bonds were to be redeemed immediately,[33] secondly, the three contracts were to be revoked by giving the required two years notice[34] and thirdly, the two firms were to be subject to normal tax provisions and exchange control regulations. Recently,

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33. This was made possible by the unexpectedly high price of copper on the world market. Presumably Anglo and R.S.T., when the agreements were reached, had not anticipated these high prices and had banked on the hope that a shortage of foreign exchange would preclude such a step by the host-state.

34. This meant that in all Anglo was able to maintain these agreements for a total of almost six years, half of the period of the anticipated twelve years.

the management, purchasing and sales contracts have also been terminated.[35] If all of the expressed aims are satisfied, a significant degree of control will have passed to the host-state. But this would imply a changed relative power over the ability to control accumulation and the operation of the plant, and there is as yet no unambiguous evidence that the host-state has a significantly greater degree of control over either of these. It will be interesting to see whether the President's statement expressed a fundamentally changed balance of power or rather (as is suspected) the perception of the real control of the host-state with respect to the two companies.

Restrictive Clauses (See 34.)

A wide variety of restrictive clauses can be used by the technology-supplier. As many underdeveloped countries have moved from import substitution to export promotion policies, attention has been focussed on clauses restricting the scale or area of exports. The Andean Pact Studies showed that of a total number of 247 contracts in Bolivia, Colombia, Ecuador and Peru, 200 had a total prohibition on exports and a further 12 permitted exports only to certain areas. Only 35 allowed free exports of output. (41)

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35. The expected results of these actions with respect to the takeover of activities were summarised by the Chairman of the Company in the 1974 Financial Statement as follows:

> Consequently, Exchange Control regulations now apply to the remittance of dividends to the external shareholders of RCM and our Company. In addition, the ordinary dividends became, upon payment, subject to deduction of withholding tax which is currently at the rate of 20 per cent. The redemption of the outstanding Zimco bonds and loan stocks also made it possible for the tax legislation in terms of which the mining companies received 100 per cent allowances for capital expenditure to be withdrawn at the end of September 1973. Government is in the process of formulating new tax legislation to replace that which was withdrawn last year. Pending the enactment of such legislation, the charge for taxation has, with effect from 1st October 1973, been calculated on the basis of the result that Nchanga stands to pay this year an additional K16 million over and above what would have been payable had the 100 percent capital allowances been in force.
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> In addition, the Zambian Government (as 'A' shareholders) are responsible for the appointment of the Managing Director. These claims should however be accepted with reservation. The Financial Times of August 7, 1974 suggests, for example, that the new marketing arrangements may make it difficult to maintain the existing skilled expatriate marketing staff in Europe. In addition, we have already considered some of the mechanisms whereby technology-suppliers can circumvent government policies.

But there are other widely used restrictive clauses. Vaitsos, in the study mentioned earlier (43), showed how clauses restricting the source of inputs were used to transfer price profits from Colombia. Reference to other literature on restrictive clauses, and to our discussion of the fifteen areas of conflict in an earlier section, will show that restrictive clauses are widely used, particularly in joint-ventures, in an attempt to exercise control in each of these areas. Thus we have evidence, for example, of restrictive clauses on patents, prices, production of similar products, secrecy, quality, volume of sales, hiring of personnel, etc. One particularly interesting clause emerges from Spain. It stipulated that if technical change were to emerge from the subsidiary's operations in Spain, the property rights over this technical change were to be held by the head office and the Spanish subsidiary would have to pay royalties to the head office for the use of the technology which it had itself developed!

The Legal Status of the Agreement

We have seen from our earlier discussion that two central concerns of the technology-supplier are to curtail the degree of risk involved in the transfer and to freeze the balance of power at the date of agreement if it is thought that a dominant position may be eroded over time.

Both these objectives may be furthered within the framework of the legal status of the agreement. The control mechanism, here, is to 'freeze the environment' at the date of agreement and to build into this agreement heavy costs if the agreement is broken. In the case of the Anglo-American agreement with the Government of Zambia which we have discussed at length, a clause was inserted which froze the legal environment at the date on which the agreement was signed. That is, in the case of a recourse to arbitration:

> ...all disputes...shall be determined by the law of Zambia (including its rules on the conflict of laws) as in force on the date of execution of these Heads of Agreement disregarding all legislation, instruments, orders, direction and court decisions having the force of law in Zambia (other than those contemplated by these Heads of Agreements) adopted, made, issued or given subsequent to the date of execution of these Heads of Agreement.

A similar clause appears in the Zambia Government's agreement with R.S.T., where in the case of disputes, the law of Zambia as of December 24, 1969, "disregarding all subsequent legislation, decisions, instruments, orders and directions having the force of law of Zambia will be applied". (32) Similarly in the agreement between the Government of Sierra Leone and the Sierra Leone Selection Trust Ltd.,[36] all disputes will be determined "in

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36. Which is part of the R.S.T. family.

accordance with the law of Sierra Leone (including its rules on the conflict of laws) as in force on 31st March 1970...notwithstanding that such legislation instruments, orders, directives or Courts decisions are stated or intended to come into effect retrospectively".(38)

This rather extraordinary clause has the effect of removing the sovereignty of the host-state with respect to the operation of the technology. It is extraordinary not so much because it is unusual, but because it is a loss of sovereignty which the respective host-states would not easily yield to the governments of powerful developed countries: yet they seem to countenance the loss of sovereignty to a private firm.

Having frozen the environment, the object of the technology-supplier is then to impose heavy costs on the host-state or partner if it wishes to break these agreements. In all three cases which we have looked at above, the arbitrating body is to be an arm of the World Bank. Thus, in the Anglo-American agreement, the host-state agreed to ratify "The Convention on the Settlement of Investment Disputes between States and Nationals of Other States ... of the International Centre for the Settlement of Investment Disputes of the World Bank (ICSID)".

The point of referring disputes to ICSID (or an equivalent body) is that insofar as ICSID is an arm of the World Bank, failure to agree to its arbitration may well lead to sanctions by the World Bank itself, and insofar as the Bank is a powerful body in the disbursement of aid, this sanction would impose great costs on an underdeveloped country.

HOST STATE POLICIES AS A CHANNEL FOR CONTROL

In theory, it is possible for a host-state to introduce a wide range of policies, ranging from detailed control over most aspects concerned in the transfer and operation of technology to a laissez faire approach which allows the supplier and recipient of technology almost complete freedom of action. In reality, of course, the efficacy of any policy which the host-state may wish to enact is dependent upon the power of the state with respect to the technology-supplier and local partner.

We shall examine these state policies in three broad areas, resource accessibility, operational conditions and the payment stream. But this is not to argue that these are the only spheres in which the host-state is able to exert control. There are other more general policies such as those concerning foreign investment and industrialisation which are relevant to the problem of control and which are mentioned in a more general context than the three types of policy discussed below.

Resource Accessibility

The type of policies concerning resource accessibility will obviously be affected by the nature of the operation in question. In the manufacturing and service sectors, the primary local resource is likely to be that of labour. In most cases, the host-state is able to control the access to this labour, and since it is cheap labour which frequently attracts the technology-supplier to an underdeveloped country, the host-state is placed in the position of ensuring an adequate supply of cheap labour to the technology-supplier. In the extreme cases of export processing zones (e.g. South Korea and Taiwan), legislation which protects the rights of labour to organise is specifically waived in order to attract foreign investors.

The role of the host-state with respect to resource accessibility is more important and far-ranging in the case of mineral production than in the processing of minerals and agricultural products or in the manufacturing or services sectors. Here the local resource is not primarily labour. Accessibility to this natural resource has a number of features. These are:-

(1) The extent of availability: exploration, mining and buying rights have to be defined over a certain volume or area of the resource. Frequently the host-state provides rights over an unnecessarily large area, which might suit the company which is concerned to limit potential competition. In this case much of the area or volume governed by the agreement may remain untouched. For example, in the case of Zambian copper, one company had previously held unutilised exploration and production rights over 4,000 square miles of land south of the Copperbelt for sixteen years. The reaction of the Zambian Government in this case was to stipulate minimum expenditure requirements as part of the exploration agreement. (16)

(2) The type of resource: in some cases there may be external economies in exploration, buying or mining which will pay the operator to combine his activities over a number of different products. The agreement on resource use may cover all feasible products, or there may exist a separate agreement for each separate case. The extent to which the host-state is able to specify the agreement to narrow down the number of products of each agreement will tend to reflect its power vis-a-vis that of the technology-supplier.

(3) The duration of the agreement will vary from case to case. In the case of bauxite exploration in the Caribbean, Girvan found that agreements tended to vary between 25 and 75 years. (14) Significantly, the latter figure resulted from an agreement in Haiti which is exactly what we would expect from a country with little bargaining power.[37] In the case of copper in Zambia, renegotiation of the agreement in 1969 resulted in a limit of 25 years, compared to the earlier agreement which gave rights in perpetuity.

Operational Conditions

The operation of the transferred technology entails the transformation of domestic and foreign inputs into outputs, some of which may be disposed of locally and some of which may be exported. The host-state may be able to set boundaries on the availability of the inputs and the disposal of outputs in a number of ways.

Availability of Inputs: Control over natural resources has been discussed earlier and we are primarily concerned here with the availability of factors of production and intermediate inputs.[38] The state may control the inflow of imported inputs through the use of tariffs, or it may use non-tariff barriers, such as quantitative restrictions on imports.

A switch from foreign to domestic inputs may be encouraged not only by the trade barriers, but also by a complementary programme of local-content incentives. Countries such as Brazil and South Africa, for example, have been able to speed up import substitution by instituting

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37. Or willpower, either.

38. Labour has been discussed above as a basic resource.

incentives for increasing the share of local inputs.

Access to local inputs can be used by the host-state as an important bargaining point enabling it to achieve a particular type of control. In Kenya, for example, access to local credit is being used in an attempt to increase local equity ownership. "Foreign companies will now be able to raise their overdraft at local banks in proportion to the number of shares they offer on the local market." (Financial Times, November 1, 1973) In South Africa, local ownership has been successfully raised in at least one case by a set of host-state policies. Thus, Alcan Aluminium reduced its holdings in its South African subsidiary from 60 per cent to 24 per cent.

> Alcan said the proposed increase in South African ownership would permit Alcan South Africa to borrow locally without restriction and relieve Alcan Aluminium of responsibility to finance expansion, except as it might agree to do so. Alcan also said the reduction of its share of the company will reflect a change in business relationship in recent years whereby tariffs and government policies have forced Alcan South Africa to buy its ingot from a domestic South African smelter rather than importing aluminium from Canada. (Financial Times, November 6, 1973).

While we have no idea to what extent Alcan may still be able to exert control over the South African subsidiary, there is a strong suggestion in this report that host-state policies were increasingly limiting this sphere of control. This case would represent an unusually strong bargaining power of a host-state, and mirrors the viewpoint that South Africa can not easily be considered an underdeveloped country.

One of the stronger weapons in the armoury of government policy is reputed to be the control over the use of foreign exchange. Policies on the repatriation of profits or capital assets and the extensive use of permits to ration foreign exchange are potentially valuable elements of control. The problem, as we have seen, with these policies lies in the ability of the technology - suppliers to reduce their efficacy by evasion. The extent to which they are able to evade these policies is a reflection of the relative powers of the host-state and the technology-supplier, although it must be recognised that this power of evasion is one of the determining

characteristics of the multi-national corporation. Governments of developed countries or those of particularly 'powerful' host-states, such as Japan, do not have complete control over the evasion of these sorts of restrictions.

One final element of government policy over operational conditions which has particular relevance to many underdeveloped countries concerns control over employment. There are two types of basic employment policies here. The first is to increase the share of local employees and to decrease the share of expatriates. At the non-managerial and non-executive level, underdeveloped countries have been quite successful in achieving this end. Thus the Venezuelan subsidiary of Standard Oil of New Jersey raised the share of local staff from 48 per cent in 1959 to 68 per cent in 1964, and Aramco in Saudi Arabia raised the share of local supervisory staff from almost zero in the late 1940s to 56 per cent in 1967. (46)

The second type of policy is aimed at the creation of new jobs in an attempt to decrease the extent of urban unemployment. One example of this type of policy is the Tripartite Agreement between trade unions, employers and government in Kenya which aimed at an all-round increase in formal sector employment of 10 per cent. (22)

Disposal of Output: The most general form which this policy takes is an attempt to increase the share of exports in total output. There are a variety of mechanisms which the host-state can use. Where the state has firm control over the establishment of industries (such as the Indian system of industrial licences), the transfer can be formally tied to specified levels and shares of output. This may be supplemented or even substituted by the use of inducements (such as tax concessions) for increased exports. But as we have already seen in our discussion of the international context of transfer, control over the direction of output is one of the major concerns of the technology-suppliers: even the most attractive inducements, and in some cases the most carefully specified agreed levels of exports, may be ignored if they conflict with the more fundamental interests of the technology-suppliers.

The Payment Stream

Control over the payment stream reflects the ability of the host-state to affect the distribution of the surplus which arises from control over accumulation. The host-state frequently has two roles in which it can attempt to influence the payment stream - qua partner, when it holds equity in a joint-venture with the technology-supplier, and qua state, when it attempts to exercise power through government policy.

There is a battery of policies which the state can use in attempting to control the disposition of surplus. Most of them centre around taxation of one form or another: taxes on profits, sales, production, imports, exports and so on. There are however a number of channels which the technology-supplier may use to repatriate effective profits (such as royalties, management fees, etc.), so there is considerable scope for the technology-supplier to evade these attempts at controlling the payment stream. The extent to which the host-state perceives the transfer accounting practices of the technology-supplier is one factor in the exercise of control, but it is by no means a sufficient factor.

One difficulty in discussing host-state imposed parameters on behaviour in this general way, is that it tells us little of the nature of control which may arise in any particular context. Potentially, all of the policies discussed above can be introduced by any host-state. In fact, most of them are not, and where they are they may be of little effect. This is the conclusion reached by Stopford and Wells: "Some countries, bargaining from certain elements of strength, are in a far better position than others to impose their desires. The policies, therefore, are one thing; the outcome of the policies quite another." (40, p. 151)

C O N C L U S I O N

Control in the transfer of technology can only be understood in relation to conflict and as a means to settling conflict in the interests of the dominant party. As such the substance and exercise of this control should be distinguished from its formal appearance (e.g. equity shares).

Although the exercise of control can be learned as in the case of the use of more sophisticated bargaining strategies - it more importantly reflects the underlying power of the respective parties. This power ultimately stems from the ability to mobilise the technical and financial resources necessary for capital accumulation.

This ability to accumulate is not only a reflection of the nature and spread of technology and financial resources, but more importantly it reflects the nature of the class structure within the accumulating system.

In the transfer of technology the dominant class is invariably the technology-supplier, generally part of a large multinational corporation. The behaviour of this class reflects accumulation in the world system, and the behaviour and interests of the technology-supplier in any particular transfer can only really be understood in terms of accumulation in the world system.

In the recipient underdeveloped countries two groups are involved in the transaction, the host-partner and the host-state. Generally the host-partner sees a closer identity of interests with the technology-supplier than the host-state and the latter is therefore more often in conflict with the technology-supplier.

Whilst recognising that the host-state seldom reflects a homogeneous set of class interests and that it is also seldom in fundamental conflict with the technology-supplier, some consideration has been paid to the areas in which its attention should be focussed and how it may begin to exercise control.

More detailed attention has, however, been paid to the manner in which control may be exercised in the operation of the technology. Five areas of control have been specified - entrepreneurial, organisational, financial, staffing and invention - and the discussion has centred on how control may be exercised within these areas in the operation of the technology.

From this discussion it has been argued that a distinction must be drawn between the substance and appearance of control. Thus while equity may reflect power it is seldom the source of power. Power, it has been argued, must ultimately be seen in relation to the ability to accumulate and this accumulatory ability is largely related to technological capability. So without an understanding of the nature of technological dominance, power cannot be clearly specified and the substance of control is more likely to be confused by the appearance.

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