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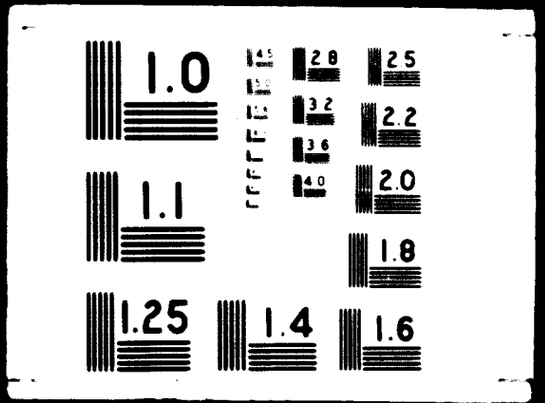

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COMPLEMENTATION AND ECONOMIES OF SCALE IN THE LATIN AMERICAN AUTOMOTIVE INDUSTRY: CASE STUDY ON ELECTRICAL EQUIPMENT 2/

presented by

J. LUCAS LTD.

1/ Organised jointly by the Economic Commission for Latin America (ECLA), the Inter-American Development Bank (IDB) and UNIDO.

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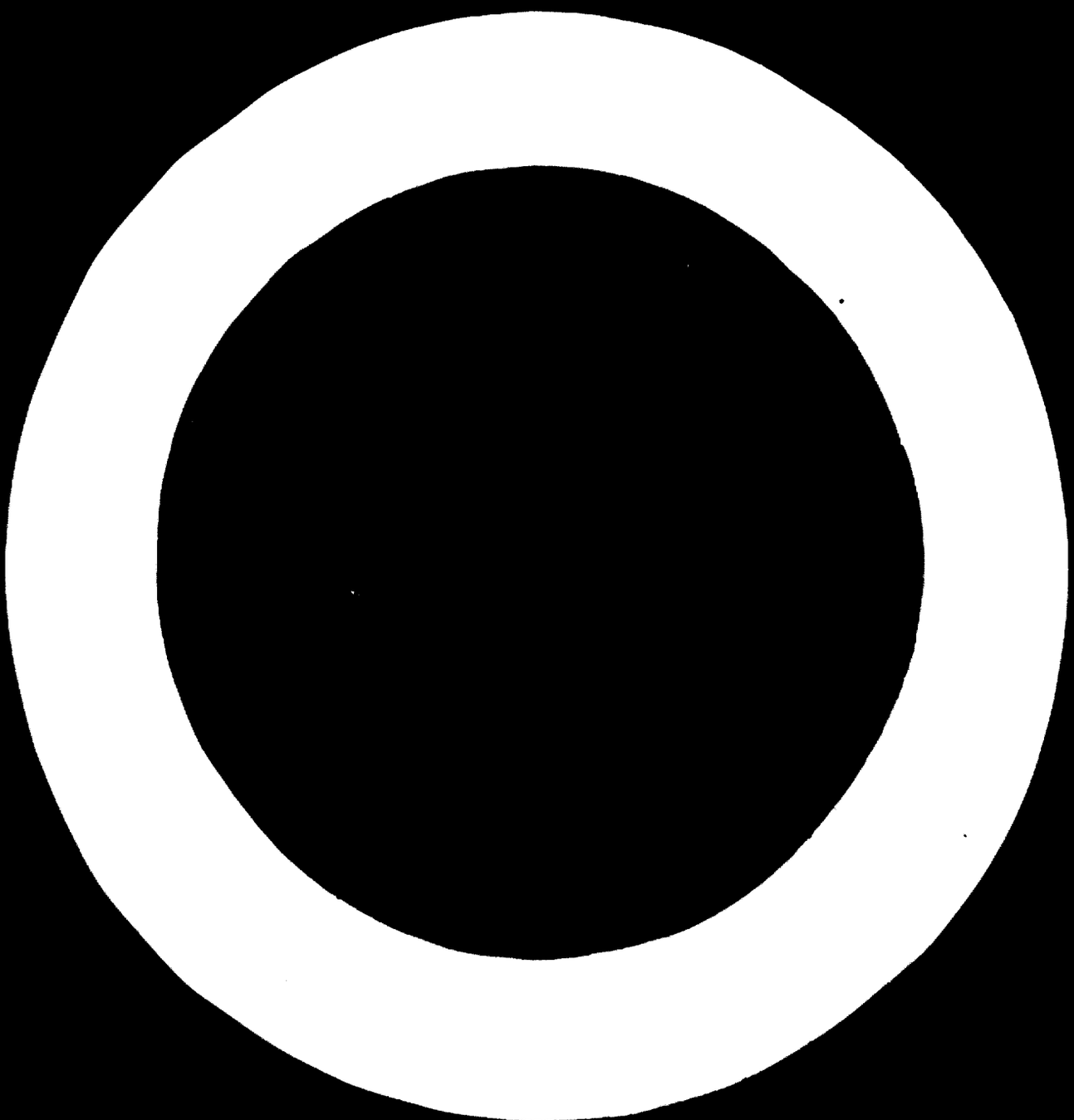


1. Introduction

Lucas welcomes this conference wholeheartedly. The economies of scale and questions of complementation are always to the forefront of our thinking in respect of our overseas operations, and in particular influence substantially our operations in Latin America.

Stability of cost of production is a major consideration in the industrial progress of Latin America. For a supplier to the international automotive industry such as Lucas, both customers and governments have a profound influence on our local cost of production: The former by the decisions taken as to where they source their material and the latter by decisions relevant to tariffs and complementation. Both these factors interact strongly in determining the available volume of production at any one of our manufacturing plants.

Increasing the scale of local production is a significant means of helping to keep down local costs of manufacture. We look forward to the contribution this conference will make towards achieving this aim.

2. Lucas activities in international engineering

By what background it may be helpful to summarize briefly the activities of Lucas in the international engineering industry.

In broad terms there are three main divisions of our engineering activity, with vehicle equipment accounting for some 80 per cent of our sales, followed by aircraft equipment totalling 12 per cent and industrial equipment providing the remaining 8 per cent.

During our 1969 financial year our total world sales were in excess of 250 million pounds, or 600 million dollars. In the United Kingdom alone we employ over 72,000 people, in some 40 separate factories, in addition to our subsidiary or associated licence manufacturing operations overseas. These include countries as far apart as Argentina, Australia, Brazil, France, Germany, India, Japan, Mexico, New Zealand, South Africa, Spain and Venezuela.

/The main

The main companies in the vehicle equipment field include Lucas (electrical), manufacturing a very extensive range of automotive electrical and lighting equipment; Lucas (batteries), a leading company in the development of storage-battery production techniques; and Girling, internationally known for its range of automotive braking equipment and shock absorbers.

In the related field of automotive and industrial diesel engine equipment the principal company in the Lucas Group is CAV, producing a full range of diesel fuel injection pumps, injectors, filters, and diesel electrical equipment, in association with the affiliated companies Simms Motor Units and Bryce Berger.

The two largest companies in the aeronautical field are Rotax, producing aircraft electrical systems and other specialist equipment, and Lucas Gas Turbine Equipment, manufacturing combustion equipment, fuel and control systems for aircraft and industrial gas turbine engines. Also associated with this group is Hobson, world-renowned in the field of specialist aircraft equipment.

In the industrial field, the Lucas Group covers a wide range of specialist hydraulic and electronic equipment, including the Lucas Industrial Equipment Company and Keelavite Hydraulics, together with companies specializing in electronic components and electronic instrumentation for measurement and control, such as Bradley, NSF, and Dawe Instruments.

In addition to our wide variety of engineering design, research, and manufacturing activities, we also maintain a world-wide distribution system of associated companies and agents, to provide after-sales service for our products.

In view of the large number of customer companies that Lucas is privileged to supply, it is somewhat of a difficult task to mention some by name and not refer to others. However, to identify our position in regard to the international automotive industry in Latin America, it may be useful to summarize matters briefly as follows.

/Our customers

Our customers for automotive electrical and diesel fuel injection equipment in home and overseas markets include the member companies of the British Leyland Group, such as Austin, BMC, Jaguar, Rover, and Standard-Triumph, as well as the factories manufacturing the heavy vehicles in the AEC and Leyland range. We supply to Rolls-Royce in England and to Volvo in Sweden, as well as to North American based companies such as Chrysler (including the Rootes Group range of models), Ford Motor Company, and General Motors (including Vauxhall/Bedford in the United Kingdom).

In France, for example, our interests range from participation in Ducellier which supplies electrical equipment to leading companies in the French industry, such as Renault, to our partnership with DBA in Roto-Diesel, manufacturing diesel fuel injection equipment for such customers as John Deere.

As well as the diesel engine divisions of many of the vehicle companies mentioned above, through C.A.V and its licensees we also supply such other leading tractor manufacturers as Massey Ferguson/Perkins, Fiat and International Harvester.

3. Lucas in Latin America

As will be appreciated from the previous section, Lucas activities cover a very wide range of products both in the automotive industry and elsewhere. In the present paper, we will restrict our discussion to one of our main automotive product activities in Latin America, namely the manufacture of electrical equipment.

This electrical case study is presented as being typical in illustrating the problems regarding the economy of scale that confront our Latin American operations, and essentially similar considerations would apply to other major products with which we are concerned, which include particularly diesel fuel injection equipment.

Although not referred to in further detail here, it should also be mentioned that the manufacture of automotive braking systems and related equipment is another area of considerable interest and activity for us in Latin America. In Brazil, for example, Girling systems are engineered and marketed through a license arrangement with Maquinas Varga in Limeira, Sao Paulo State.

/Perhaps it

Perhaps it should also be emphasized that we have no set or inflexible approach in Latin America in respect of license operations, joint-partnership ventures, or fully-owned subsidiaries. The form the local Lucas company takes depends upon the background circumstances and the current need. We have examples of all three types of companies operating successfully here in the various countries where we are established.

Our biggest single manufacturing operation in Latin America is in Argentina where Martin Amato y Cía., employing some 1,000 people, produces a range of electrical equipment including starter motors, generators, alternators, voltage regulators and other items. This flourishing venture is a partnership operation, with Lucas having a majority interest.

In Brazil we have a fully-owned company, Lucas do Brasil S.A., employing about 200 people. This was formed in 1966 to bring together under one roof the two separate manufacturing operations previously established in Brasil under the names of Equipamentos Joseph Lucas do Brasil Ltda. and C.A.V. do Brasil, respectively.

Lucas do Brasil's main original equipment turnover is in diesel fuel injection equipment, producing annually some 15,000 C.A.V. DPA distributor-type fuel injection pumps, together with the associated injectors and fuel oil filters. In addition there is a vigorous electrical section, producing each year some 250,000 ingnition coils for the original equipment and service markets.

In Mexico we have another partnership venture, where Lucas has a minority interest in Inyec Diesel at Saltillo, near Monterrey. This is a relatively new company, employing some 180 people, specializing in the manufacture of diesel fuel injectors and filters.

In Venezuela we have a newly-formed company, Lucas de Venezuela, whose business it is to supply Lucas starters and alternators to the original equipment market in Venezuela. Here we have a particularly apt illustration of the effect of the economies of scale. While there is a specific demand for our products as standard equipment on certain models of vehicle produced in Venezuela, the size of the market is limited. At that level of production, the most practical way of keeping manufacturing overheads within acceptable

/limits was

limits was to make use of existing Venezuelan manufacturing capacity and to sub-contract our assembly work, which is the procedure we have in fact followed. Such work is conducted under our own supervision, using our own methods of product test and quality control.

A most important side of our business is providing an efficient after-sales service for our products to support our original equipment customers. For this purpose we have a fully-owned central distribution company in Panama, Lucas (America Latina) S.A. whose responsibility it is to distribute parts of our Agents throughout the Central American and Caribbean States.

For the remaining markets in Latin America our local Agents order their parts directly from the United Kingdom. In Mexico we have a shareholding in our agency, Electro Diesel, and we participate similarly in Lucas Service Argentina in Buenos Aires. In Brazil our fully-owned company, Lucas do Brasil, has the responsibility for after-sales service and parts marketing. Associated with each of these major central distribution companies is a comprehensive network of sub-distributors in each country concerned.

In conclusion, it may be of interest to remind ourselves of the circumstances in which a manufacturing company such as Lucas starts up an operation in an overseas location such as Latin America. The basic reason is that local conditions have made it no longer possible to export from the parent manufacturing company.

However, as soon as this occurs, the benefits of scale are immediately forfeited. If, on the other hand, at the beginning of setting up our various operations in Latin America, there had already been a situation permitting fully integrated free-trading, then we would have been able to plan our production resources to give the maximum benefit of economies of scale.

As it is, the requirements for small-scale manufacture in different localities can only lead to an uneconomic fragmentation of production resources. To counteract this situation, there must now be the opportunity for complementation and exchange, so that production volumes can be increased, with all the resultant benefits to production costs.

/4. The pattern

4. The pattern of automotive component supply in Latin America

The first step in any economic analysis is to define the nature of the market. As a supplier to the automotive industry, Lucas does not supply direct to the end user. Our customers are the vehicle assemblers and the engine builders, and so our first concern must be to analyze the wants and needs of these specialist customers.

The first question to consider is what sources of supply can a vehicle or engine manufacturer in Latin America draw upon for his components, particularly electrical components and diesel fuel injection equipment in the cases we are considering. In principle there are four possibilities:

(i) To import the components as part of the material the manufacturer is purchasing from his parent company.

(ii) To import directly from the existing supplier to his parent company.

(iii) To import from an existing supplier in another Latin American country.

(iv) To purchase from local sources.

In ideal circumstances, the choice of the source will depend upon a number of factors which will include:

(a) Technical performance of the component in relation to the requisite engineering specification.

(b) Quality and raliability of the component.

(c) Reliability of the source of supply in meeting delivery schedules.

(d) Competence of the supplier in respect of after-sales service.

(e) Possibility of developing future product designs in collaboration with the customer.

(f) Price, landed instore at the manufacturing customer's plant.

All of the above factors interact in guiding the buyer to his ultimate choice. For present purposes it is necessary to simplify matters and assume that all the first four factors are equal, and concentrate solely on the economic factor of price. This will be determined both by production costs and by tariff barriers.

/On the

On the basis of economies of scale, it is axiomatic that the suppliers lowest ex-works price for a component will almost inevitably be that engaged by the parent company, based upon the latter's massive purchasing power in terms of quantities. In the absence of tariff barriers this gives an economic advantage to case (i). In the early stages of developing a local industry, this procedure is in any case frequently used where there is no local source whatever of the particular component.

Because of the effect of relative quantities, case (ii) will not usually offer the same economic advantages as case (i), although this procedure can sometimes be used in special circumstances.

Again in terms of relative scales of production on an ex-factory basis case (iii) will usually be more costly than case (i) and (ii). However, this is where preferential tariffs and considerations of shipping distances can even matters out as far as the customer's final landed instore cost is concerned.

In respect of case (iv), the merits of local purchase are heavily dependent upon the effects of scale. To offer economic advantages to the local automotive assembly plants, it is necessary to seek out ways and means of developing the specialist local component industry to the point where it can compete effectively with imported material.

Bearing the complexities of this marketing background in mind, we can now consider a typical case study relating to Lucas products in Latin America.

5. Case study: The economies of scale

5.1 Production methods

The very wide range of products that Lucas supplies to the international automotive industry means that Lucas production engineering departments are concerned with a correspondingly wide range of production techniques, covering many different processes and methods.

Taking automotive alternators (or alternating current generators) as a typical example, such units are assembled on flow-line principles from previously manufactured sub-assemblies as piece-parts. These piece-part components are manufactured in capital intensive plants, on very expensive machine tools requiring multi-shift utilization for economic usage.

/Economies of

Economies of scale can operate in two ways. Firstly for a given installation, benefits will result from increased plant utilization as quantities increase. Secondly, increased production gives opportunity to introduce entirely new methods of piece-part manufacture and to plan more efficient assembly lines.

It is not within the scope of this present paper to discuss production techniques in detail, since this is a specialist topic on its own. In general terms, however, it will be evident that the size of the particular market being supplied will determine the appropriate production techniques to be used. In setting up any new venture, it is Lucas' policy to introduce the latest available technology, wherever applicable.

In any economic study, however, the question of plant utilization is highly significant. This is particularly the case when, as for many of the types of piece-part component that Lucas manufactures, there is a minimum economic output for the installed plant. Unless the market being served can absorb at least this minimum output, the plant investment becomes a direct loss.

In such cases of capital intensive production, the question of economies of scale may be directly related to machine-tool amortization. While this is a very familiar and fundamental principle, it may be helpful to fix ideas by expressing this in figures with a simple example.

Let us consider a small manufacturing unit making precision parts with a design capacity of 500,000 units annually, which has cost 1 million dollars in plant and machinery. If depreciation is spread over 10 years, the annual charge will be 100,000 dollars. This amounts to 0.20 dollars per unit at design capacity.

For purposes of numerical illustration we will take the prime production cost of each component (excluding depreciation) as 0.75 dollars per unit, and will assume this to be effectively independent of throughput within the limits considered. The market value price of the finished part will be taken as 1.00 dollar.

On the basis of these figures we can readily see that if the market demand does not equate the design capacity, then this plant will very rapidly run into a loss position, as shown by the following tabulations.

/CASE A

CASE A: Plant operating at design capacity 500 000/year.
Depreciation charge per unit US$ 0.20

Selling price per unit		1.00
Prime production cost		0.75
		0.25
Depreciation		0.20
PROFIT:	US$	0.05

CASE B: Plant operating at break-even capacity 400 000/year.
Depreciation charge per unit US$ 0.25

Selling price per unit		1.00
Prime production cost		0.75
		0.25
Depreciation		0.25
BREAK-EVEN:	US$	NIL

CASE C: Plant operating at reduced capacity 300 000/year.
Depreciation charge per unit US$ 0.33

Selling price per unit		1.00
Prime production cost		0.75
		0.25
Depreciation		0.33
LOSS:	US$	(0.08)

Note 1: In Case "C" the effects are calculated ignoring "lost time", due to operators waiting for work and losing the rhythm of production.

Note 2: It should be emphasized that in our type of business, it is not only depreciation of machinery which influences this unit cost in a situation where production is below plant capacity, but also the inevitable additional overheads of administration and engineering development for a complicated range of products, intended essentially to suit high production requirements.

In a correctly managed situation the above type of operation at reduced capacity should of course never occur, since the plant installed should be correctly aligned to the size of the market. If, on the other hand, local manufacture is insisted upon for a low-volume market, then this will result in correspondingly higher prices, which is not desirable.

/For any

For any such low-volume market situation overseas, the size of the market has to be carefully assessed in relation to minimum economic plant utilization before the installation of capacity to manufacture piece-parts and components can be contemplated.

However, the cost of assembling manufactured components into complete units presents a somewhat different picture. Assembly is generally speaking labour intensive. Where the product is such that there is a simple basic assembly flow-line, then obtaining a high assembly output is only a matter of installing a multiplicity of these basic flow-lines (assuming that no radical change in assembly methods is introduced). In this case assembly costs are not necessarily affected by volume to the same extent as are component manufacturing costs.

Regretfully, however, this does not necessarily have an overriding effect in keeping down the relative cost of low-volume production, because the assembly cost is often only a small fraction of the total.

This discussion emphasizes why it is, when starting up a small-volume production operation in an overseas location, that there is a certain logical economic sequence that Lucas will endeavour to follow, in common with other manufacturers of similar products. This is the familiar evolutionary stage-by-stage process, namely:

1. Initial operation: Local assembly from imported components.
2. Follow-up operation: Local manufacture of selected simple components.
3. Subsequent development: Progressive local manufacture of more complex components as and when justified by the size of the market.

The above stage-by-stage process represents the ideal. Again it should be emphasized that if at Stage 3 local regulations insist upon the premature introduction of local content before the size of the market is large enough, then this will necessarily involve an undesirable cost penalty.

/5.2 The production

5.2 The production of automotive alternators in Argentina and Venezuela

5.21. Introduction. This case is chosen because it illustrates particularly well the relationship between the effects of production volume on costs, the economic desirability of maintaining stable and competitive prices, and national policies regarding local content and local manufacture.

These factors are sometimes in conflict, and where conflict exists then there must often be compromise to obtain a practical solution. The example shows how essential complementation agreements are to the solution of the problem of keeping down manufacturing costs in Latin America. This case study is not yet closed, because at the time of writing the complementation agreements referred to are not yet in force. However, it demonstrates the advantages that could be obtained if they were.

5.22. Product type. In this example we will examine the manufacture of automotive type alternators. Mechanically these are very simple rotating electrical machines. Models are available with various outputs, covering the range up to 50/60 amps at 12 volts. Size depends upon output, but a typical machine may weigh some 3 to 4 kilograms, and have dimensions 20 cm by 15 cm in diameter.

The Lucas design of alternator is fitted with a built-in transistor micro-circuit regulator, featuring a high degree of advanced technology. The main mechanical components, however, are comparatively few in number, and consist in the first place of a central shaft carrying a 12 pole electromagnetic rotor energized by slip rings. This unit rotates within the corresponding generator windings, consisting of copper wire in coils on a stationary laminated iron stator. These stator windings are located in end brackets consisting of aluminium die-castings.

Alternators are now being used in increasing numbers in the automotive industry instead of direct current generators, particularly for higher outputs, and because of technical advantages in respect of battery charging over the full speed range.

/5.23. The

5.23. The economies of scale. These machines are produced in very large numbers, around 100,000 units per month, in the Lucas Factory in England at Marshall Lake Road, Birmingham. The electromagnetic rotors are cold-formed by special tools, and special machines have been installed to wind the stator coils. The die-cast end brackets are made in correspondingly large quantities in an automated foundry.

Similar machines are also made here in Latin America in our Argentine factory. However, the average monthly demand for the Argentine market is only around 10,000, which is 10 per cent of the production of the United Kingdom plant. In such circumstances it is clear that production costs in Argentina cannot be expected to compete with those in the United Kingdom, when compared under otherwise identical conditions of operation.

When we first came to set up our operation in Venezuela to supply Lucas alternators to the local market, we were concerned with even smaller quantities, of the order of 200 per month to begin with. On the basis of relative costs, there was consequently no justification on purely economic grounds to try starting up such an operation with the local manufacture of piece-parts.

We can illustrate this effect of the economies of scale on relative manufacturing costs with the following simple table:

THE ECONOMIES OF SCALE: FACTORIES DESIGNED FOR DIFFERENT OUTPUTS

Country	Monthly output	Approximate index of relative unit manufacturing costs
United Kingdom	100 000	1
Argentina	10 000	1 3/4
Venezuela	200	5

Purely on cost grounds, the most economic method of starting to produce alternators in Venezuela would be to assemble these from piece-parts sourced from the United Kingdom, as the above comparison of relative production in volume and costs demonstrates. This was in fact the way Lucas started its operation.

/It should

It should be emphasized that the above manufacturing cost tabulation refers to an ideal situation, comparing three separate factories specifically laid out for the given production volumes. It should not be taken to indicate the level of final cost in the three different countries mentioned. In practice there are often many other social and economic factors to be considered that will alter the relative values.

5.24. Local manufacture. As the size of the local market develops in Venezuela, certain parts may progressively lend themselves to local manufacture. The aluminium cast parts are an example currently under study. However, on the basis of the relative costs of local manufacture in small quantities, it will still be desirable to continue importing other major components from cheaper large volume production sources elsewhere.

In common with many other countries, Venezuela has a policy of building up local industry and developing manufacturing skills and employment by legislation in respect of the local content in its automotive industry. However, as the table shows, to have all the piece-parts for the alternator made in small quantities in Venezuela will make the material costs for the finished local article some five times as expensive compared with parts and material imported directly from the United Kingdom.

While this process may perhaps benefit local industry, it does not help the local consumer. This in fact emphasizes the fundamental problem that so often faces the automotive industry in Latin America: namely how can local manufacture be developed while still keeping the price to the end user at an acceptable level.

5.25. The benefits of complementation. The situation described is precisely where the concept of an integrated Latin American operation can bring its benefits. Looked at from this point of view, the most reasonable way of keeping down final product costs in Venezuela is to take advantage of low cost sources of supply of piece-parts that are already available from Lucas manufacturing plants elsewhere in Latin America.

/Consider,

Consider, for example, the economic advantages that would arise from complementation agreements between Venezuela and Argentina, so that instead of incorporating high cost Venezuelan parts in the final assembly to achieve local content, imported parts from Argentina could be used instead on an equivalent basis. As the table shows, the relative unit cost of the material for the Venezuelan product would be reduced from 1 to 1.3/4. It must be emphasized that this comparison is made on an equal duty-free basis, since present day considerations of tariffs and duty drawbacks will further influence this ratio.

Such an arrangement would not only be of benefit to Venezuela by keeping down costs, but would also benefit Argentina in terms of additional export business for Argentine non-traditional products.

5.26. Complementation in practical terms. In the previous section we have referred to the benefits of an integrated operation. To complete the picture we must also discuss how complementation can be applied in practical terms. In other words, if Argentina is to export to Venezuela, then there should in turn be complementary markets open to Venezuela, so that the latter can export its own specialized products simultaneously by reciprocal trading.

It is at this stage in the economic analysis that the practical features of the industries concerned have to be taken into account. In broad terms, in the case considered there are three different ways in which complementation could be put into effect:

(i) By exchanging piece-parts or partly finished products between factories in the same industry in different countries (for example, automotive alternator rotors from Argentina for automotive alternator end-bracket castings from Venezuela).

(ii) By exchanging fully finished products within the same industry in different countries (for example, Argentine built automotive alternators for Venezuelan-built automotive starter motors).

(iii) By exchanging fully finished products from different industries in different countries (for example, Argentine automotive electrical equipment for Venezuelan petrochemical products.

/The practicability

The practicability of each of these procedures depends upon the technical features of the products and the industry, and on the relative level of industrial development in each of the respective countries concerned.

In the specific case of autoelectric product manufacture, there is already in Argentina, for example, a highly developed and self-contained industry. This makes Argentina a potential source of low cost components for assembly in other Latin American countries with less well-developed autoelectric industries, but means in turn that Argentina has no good reason to want to buy autoelectric parts from outside sources.

In other words, to think of complementation in terms of, say, an exchange of Argentine autoelectric piece-parts of fully finished products for complementary autoelectric material manufactured in Venezuela is not realistic, at least in present day circumstances. This makes the acceptability of Schemes (i) and (ii) above problematical. In fact in terms of practical production engineering, Scheme (i) is the least likely to be acceptable.

It follows that in some respects Scheme (iii) may appear to be the most satisfactory approach. Here complementation is not viewed in the narrow sense of exchange within one specialist industry, but rather in terms of the broader concept of the exchange of the products of one industry for those of another. As noted, this could possibly mean the exchange of Argentine autoelectric products for Venezuelan petrochemical products, or perhaps alternatively for Venezuelan aluminium products. In other words, complementation is being implemented here in the true sense of the word, by taking advantage of the indigenous natural and industrial resources that are readily available in each of the countries concerned.

While this type of exchange may represent an economic ideal in purely theoretical terms, the severe practical difficulties have to be acknowledged. Negotiating successful complementation agreements between the same industrial sectors in different countries can be difficult enough. To negotiate between different industries in different countries is even more complex.

/For one

For one thing, the fluctuations of relative demand and business activity within the different industrial sectors concerned introduce difficulties in respect of the practical administration of such bilateral agreements, for example in regard to the allowable reciprocal quotas. Furthermore these additional outside variables create problems for the individual companies concerned in respect of maintaining the proper managerial control over their own individual manufacturing and marketing operations.

However the above considerations certainly do not mean that there are no possibilities of making progress in respect of complementation in whatever form it may best be implemented. The practical difficulties have first to be recognized and then have to be resolved. Each individual possibility for complementation and intertrading must be studied carefully on its own merits as and when it arises, so that no opportunity is lost for taking action. Even without going further into individual case details, the broad objective should remain quite clear. The aim is to have a progressive liberalization of trade between Latin American countries, so that the proper advantages can be taken of the economies of scale.

In the specific case just discussed, the benefits are evident. In particular, as far as Venezuela is concerned, its domestic autoelectric industry could then be developed at its own proper pace in relation to the size of the total domestic and export market, without being forced to introduce local content at too early a stage with all the resultant detrimental high costs.

In the initial stages, Argentine autoelectric parts could be imported for local assembly, in exchange for Venezuelan specialist products that could be advantageously used by Argentina. As soon as the right time has been reached in terms of the size of the local market demand in Venezuela, then certain selected piece-parts may well become competitive in cost when manufactured locally, compared to the cost of the imported material. At this stage local manufacture can be introduced on a progressive basis, while still maintaining an acceptable level of final product cost.

/Looking ahead

Looking ahead in the long term, it is also possible that the best practical chance of making a sucess of the involved business of complementation with the technically complex units we have been describing is by exchange of products from country to country between the manufacturing units of a multi-national company such as Lucas. This will involve less disturbance to the legitimate interests of existing local suppliers, than for example exchanging bought-out items such as castings.

6. Summary and future prospects. The example discussed is important in that it illustrates some of the fundamental problems in applying the concept of complementation between countries with different degrees of industrial specialisation and development.

In the case considered we have on the one hand Argentina, with a relatively large automotive industry, supported by a fully developed autoelectric supply industry. On the other hand we have Venezuela, with a numerically smaller market, and consequently a less strongly developed manufacturing autoelectric industry.

In regard to the opportunities for introducing benefits from the economies of scale, the Argentine autoelectric industry itself can look to three possible areas for expansion, namely:

(a) The intrinsic growth of the Argentine domestic market.

(b) The export of complete electrical equipment.

(c) The export of sets of parts of autoelectrical equipment for assembly in other countries.

From the Venezuelan point of view, on the other hand, the key question is naturally in what direction should Venezuela look for the future development of its own industry, so that in turn it can take advantage itself of the economies of scale. And in this context, what form should complementation take in respect of Argentina and Venezuela?

/In the

In the example discussed, the practical benefits to Venezuela in terms of final product cost have been emphasized, on the basis of complementation agreements between Venezuela and Argentina that would allow low cost parts to be imported from Argentina, to be incorporated into Venezuelan assemblies for purposes of national content.

In return, if Argentina is going to enjoy the benefits of this increased export market, then Venezuela will want to have the opportunity of exporting specialist products based upon its own resources to Argentina.

Carrying these arguments a stage further, so as to bring additional benefits from the complementation concept, one could then look at the possibilities of complementation between Venezuela and, say, Colombia, as a neighbouring country in the Andean Pact Group.

If Colombian products can be interchanged for Venezuelan automotive parts, then in the particular case we are considering, Venezuelan-built alternators could be exported for use by the growing Colombian automotive assembly industry. In terms of the economies of scale and the resulting price stability, this has a cumulative chain effect. The volume of the Venezuelan alternator business is increased, and so is the volume of demand on the Argentine factory supplying the specialist piece-parts for assembly.

There are of course also alternative possibilities to consider if, for example, complementation is agreed between Colombia and Argentina, allowing the export of Argentine-built autoelectrics direct to Colombia in exchange for Colombian products. Each such possibility must be considered on its own practical merits in terms of the range of products available in each country for intertrading.

This autoelectric case study illustrates what complementation should, and could, mean in practical terms, and also the cumulative benefits that can result from the process. Every manufacturer in the automotive industry welcomes the idea of economies of scale. But the introduction of such economies in Latin America cannot be undertaken unilaterally by the manufacturers themselves. The practical introduction depends in the first instance upon the appropriate trading agreements between Governments.

/To put

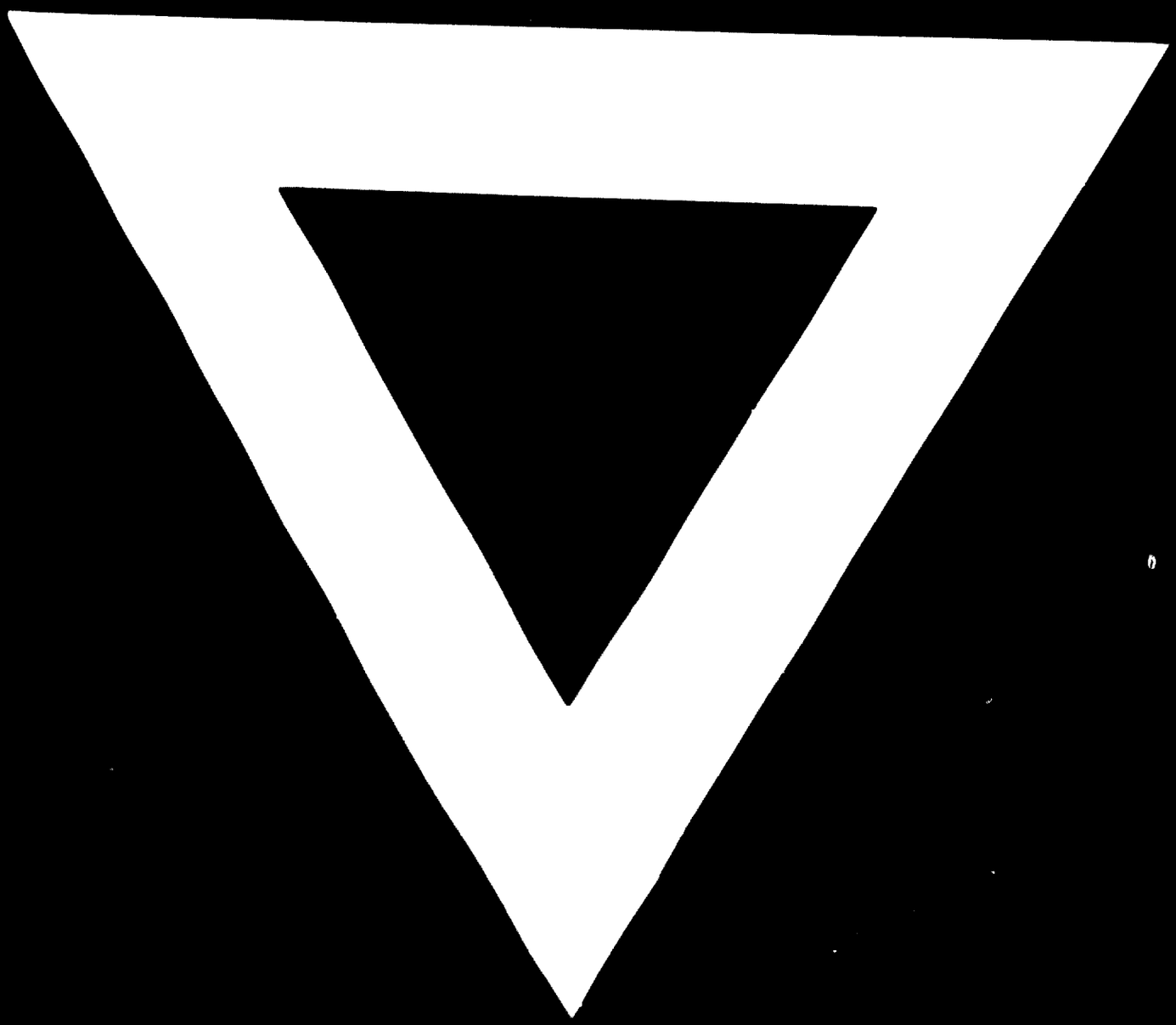
To put such economies of scale into effect there must be complementation arrangements that will allow both the overall expansion of trade between Latin American countries, and also the local development of specialized resources. Only in this way can a sufficient volume of business be generated to keep production costs down in individual local manufacturing plants, with all the consequent benefits to the national economy and the consumer.

This type of operation is a partnership in the fullest sense. Without a close working co-operation with our customers in the international automotive industry, we cannot plan for the future. But unless there are complementation agreements between Latin American countries that allow our customers to buy freely from indigenous Latin American sources so that these can be developed on a logical specialist basis, then the scale of our individual local manufacturing operations will be restricted, and costs will be high.

Without the possibilities of free trading and complementation throughout the Latin American automotive industry, a capital intensive manufacturing operation such as autoelectric production will always be at a disadvantage. To have a separate Lucas plant making the same identical products in each Latin American country in which there is an automotive industry is completely illogical, economically speaking.

To foster the most satisfactory economic conditions, there must be specialisation and exchange. Without this there will inevitably be a situation of small production runs and high production costs, with all the cumulative adverse inflationary effects on the economic development of Latin America as a whole.

But if on the other hand specialization and exchange can be properly encouraged, the future opportunities are outstanding, in terms of the growth prospects for the Latin American automotive market as a whole. We all hope that the work of this present conference will contribute substantially towards the practical realization of this very promising future.



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