

# Review Article

## "STEEL PRODUCTION IN SCOTLAND: STRATEGIC CONSIDERATIONS FOR THE 1990s" A REVIEW

James Love, Department of Economics,  
and  
James Stevens, Fraser of Allander Institute,  
University of Strathclyde

### (i) Introduction

This paper serves to review a recent report prepared for Strathclyde Regional Council by Glasgow University on the subject of the future of plate production in Scotland. A general theme which the Glasgow Study seeks to develop is that Scotland is by no means a poor location from which to produce and market steel products. This is a point which we accept unreservedly. Thus arguments set out concerning the cost advantages afforded through access to the deepwater docking facilities at Hunterston and the existence of a skilled, flexible and motivated workforce are given correct and proper emphasis. With respect to bulk handling of iron ore, coking coal and other materials, the Study points out that, on the basis of present throughput, savings of at least £5.5m potentially accrue from an ability to utilise larger vessels than at any of BS's other facilities. In addition, the study convincingly argues that freight charges are set to double over the coming decade and that this would increase the attractions to BS of using Hunterston where, as the report points out "there is plenty of scope to reap the benefits from economies of scale in shipping." (p:28)

The existence and potential of Hunterston underpins the view, set out succinctly in an unpublished paper by Mr. Ted Ramsay, that it is more economically and environmentally efficient to transport semi finished or finished steel products into the congested Euro centre than bulk quantities of raw materials. In this context, the penalties of transporting steel from a peripheral location are offset by both the aforementioned transport savings and demonstrably lower operating costs. At a time when the EC is framing the 1995 General Objectives for Steel a coherent argument both could and should be made that the periphery is an optimal location to base steelmaking and certain steel using industries and that a spatial

policy rather than a free market approach towards the location of such activity is warranted. The Glasgow Study provides limited but valuable evidence on this issue. We will return to this question in our concluding remarks in the context of the locational upheavals which will arise from the progressive adoption of new steelmaking processes from the middle of the 1990s.

In our view, the problems and traumas experienced by the Scottish steel industry in the 1980s did not result from Scotland being an inherently poor place to base steelmaking operations. The basic difficulty emanated from the fact that steel production in Scotland is controlled externally and that the Scottish plants came to be regarded as marginal to BS's likely requirements. Although the terms of privatisation would compel BS to sell the Ravenscraig operation should it be genuinely surplus to requirements, the obstacles to securing some sort of spin-off are formidable. Thus, it is our intention to clarify the strongest case for continued Scottish steel production within a British Steel framework. This necessitates consideration of both the technological and market trends which will shape the evolution of the industry in the coming decade. In addition, to understand the issues facing the industry, we review the investment decisions taken in the 1980 and where they leave Scotland in 1995. We do not accept that the Glasgow study has been successful in demonstrating that BS shareholders are best served by siting the platemill in Scotland. It is our view that the plate mill decision cannot be isolated from the trends and pressures influencing the wider Scottish sector and that unless a case for steelmaking can be made, a Scottish platemill is best sited elsewhere within the corporation. We conclude that the best possible case reflects new technology which favours the development of facilities at Hunterston.

(ii) Demand, Technology and Steel Strategy.

The Glasgow Study outlines the ongoing trend in the market for steel products. The Report sets out that "throughout the 1970s and 1980s the market for steel has been characterised by increasing product differentiation and market segmentation" and that "there is every reason to believe that this trend towards increased product differentiation will continue and that for the most part it will be demand led."(p:5) Thus, steel users are becoming more specific in their requirements and, as the market for most classes of steel product fragments, it will be difficult for steelmakers to structure throughput in order to generate long production runs.

This view of the evolving nature of steel demand commands widespread support amongst steel strategists and analysts. However, few would accept the limited supply side argument which the Glasgow Study chooses to derive from this trend. This is because the Report totally and explicitly ignores technological trends and how they will influence steel supply and the Scottish situation. Although advanced computer control and automation of processes are also of considerable importance, Love and Stevens(1989) argue that there are 2 imminent process innovations which will have a major bearing on future world steel production.

(a) Thin Slab Casting: This process dispenses with the need to invest in Hot Strip Mills of the type located at Motherwell. A thin slab caster inputs liquid steel and outputs a thin strip of hot material which can be transformed into a saleable product with minimal further preparation. In short, it is a continuous caster which produces strip products with minimal further processing and lower capital and operating costs. At present, variants of this technology are being adopted in US, German and Italian plants. In the USA, the Nucor Corporation has installed the German SMS thin slab casting system at the Crawfordsville mini-mill in Indiana. The caster has experienced well-publicised difficulties which have resulted in Nucor posting losses. In addition, there is controversy over the quality of the final product. However, the technical problems are being addressed and eliminated. In Germany, Thyssen are testing a rival German system at the Ruhort Works. This is a joint venture with the French state steelmaker Usinor-Sacilor and reports indicate satisfactory progress with commercial production at Ruhort of 5-600000 tonnes p.a. expected within

1 to 2 years. In Italy, a third, recently patented German technology is being installed at Finaverdi's strip plant in Cremona. The caster is to be commissioned in 1991 and will have an annual throughput of 500,000 tonnes p.a. These and other similar technologies promise to substantially lower the minimum efficient scale of integrated stripmills. This will result in cost effective small scale production of most ranges of hot strip and could signal the way for steel users to manufacture all or part of their own requirements. Ex-post, this technology could call into question the wisdom of the current wave of modernisations of traditional stripmills.

(b) Direct Smelting: The dominant steelmaking process involves the production in a blast furnace of molten iron from iron ore and coke. The molten iron is fed into a basic oxygen converter for the final preparation of liquid steel. This process, referred to as the BF-BOS route, involves the use of at least 4 steps. All ore must be graded and prepared for the BF and low grades and finer grades can only be used after an agglomeration process known as sintering. The coal requires to be baked in coke ovens to produce coke for the smelting operation. The BF and the steel converter complete the sequence. This collection of operations is both capital and energy intensive and subject to economies of scale. Thus as plant size increases, the average cost of a tonne of steel falls. Direct smelting promises to eliminate the need for coke ovens, blast furnaces and oxygen converters by preparing steel from ore and coal in a single furnace. Several major steelmakers are attempting to perfect this technology. The expectation within the industry is that direct smelters will go into operation within 5 to 10 years. BS are involved in a joint venture with the Dutch steelmaker Hoogovens on a variation of this technology. BS Technical Director, Dr. Frank Fitzgerald, has given industry specialists periodic progress reports which indicate that BS appear likely to have a commercial system within this time horizon. The Direct Smelting process would provide steel from low capacity furnaces at prices competitive with the large BF-BOS operations. This offers a low-cost entry into a capital intensive industry and has major implications for the structure of the sector.

Against such a background, steelmakers will approach the construction of new coke ovens, blast furnaces and oxygen converters with some caution. A recent IISI survey of Western World cokemaking

capacity indicates that plant producing 46.6mt p.a. has been decommissioned between 1982 and 1988. West Germany is the only industrialised country which has embarked upon a major modernisation programme and growth in capacity is otherwise located in LDCs such as Brazil, India and Korea. Because the commercial availability and timing of Direct Smelters is uncertain, all Western World steelmakers face a strategic dilemma. Although the coal injection process which reduces the need for coke in Blast Furnaces has offset some of the pressure, coke is set to become in short supply and may force certain steelmakers to modernise capacity over the coming period. As indicated above, West Germany is modernising its cokemaking facilities as part of a wider upgrading of existing BF-BOS systems. Other steelmakers will avoid such commitments unless absolutely necessary.

The implications of such impending technological developments were set out in a paper presented at Metal Bulletin's Third European Steel Conference by Marcel Genet of McKinsey & Co. Genet's theme of quality restructuring is set against a background in which new steel products are increasingly customised to specific user applications. His main argument is that steelmakers will require to adopt "small scale, capital saving technologies" and that this would prompt the industry to "dis-integrate" into a number of highly specialised sectors. He endorses the view that technologically advanced minimills will progressively encroach upon the traditional product range preserves of the large scale integrated operators. In this view, 5 discernible types of steel producer will emerge in the early part of the next century. First, a group of global, technology intensive companies providing advanced and differentiated products to large quality-conscious customers such as car makers. Second, a "potentially global group of entrepreneurial companies which have built their strategies around applying new process technologies." Third, a set of producers applying "hybrid technologies" to supply either regional or client-based niche markets. Four, traditional mini-mills. Five, "a gradually shrinking group of traditional companies that have failed to make the transition to one of the preceding four groups." Genet concludes by stressing that decisions made over the next few years will determine which of these routes specific companies take.

Thus, there is every reason to expect any assessment of BS's strategic options to have

technology as a central consideration. However the Glasgow Study seeks to isolate the platemill decision from wider technological trends in a wholly invalid way. The Report sets out its technological assumptions thus, "according to ECSC, the kind of technical change likely to emerge in the 1991-1995 period will concentrate 'on optimising existing processes with a view to producing faster, better and more cheaply.'"(pp:17-18) This ignores the fact that the platemill under consideration will come on stream at the end of this period and operate over a 15-20 year time horizon when huge technological upheavals with attendant locational consequences are confidently expected.

### (iii) Scottish Steel in the 1980s

As the Glasgow Study notes, "the Scottish plants received substantial amounts of fixed investment in the 1970s which provided capacity and machinery to produce high quality steel and steel products."(p:8) Thus, at the start of the previous decade Ravenscraig presented BS with its lowest cost route to manufacturing high quality strip products. In technical terms Ravenscraig was BS's best plant and offered concast and secondary steel making which did not exist at other sites. The 1980/81 Corporate Strategy published in December 1979 illustrates the strong position that the Scottish plant found itself in. This document set out that, in the event of BS standing down strip making capacity, the two technically inferior Welsh operations would bear the burden of closure. Within 2 years this situation was reversed and in an environment of substantial excess capacity BS began to argue publicly that Ravenscraig was surplus to requirements. The thrust of BS's argument, set out in evidence to several House of Commons Select Committees, was that the Welsh stripmills were larger scale, better laid out and closer to final customers. In 1982, following considerable pressure from Scottish interests, Ministerial intervention secured a guarantee for Ravenscraig until 1987. However all through the 1980s, BS officers argued consistently that Ravenscraig was likely to be closed but stressed that the closure would be "phased" over a considerable time period.

BS's investment programme in the first part of the 1980s was subject to 2 mutually reinforcing pressures. First, the Davignon Plan restricted the basis and level of state aid to the Corporation and all other steelmakers as part of Europe-wide

measures designed to effect modernisation, restructuring and capacity reduction. Second, complimentary pressure was exerted by the UK government who set tight financial targets in order to induce cost reductions and greater commercial viability as a prelude to the flotation of the company. During and since that period, BS investments have essentially been either repairs of existing plant or the installation of process innovations at the 4 English and Welsh works. This latter expenditure served to bring the other operations up to the same technical standards as their Scottish counterpart. From the early 1980s, our analysis sought to stress that Ravenscraig was protected within the BS system by technical advantages which offset the locational disadvantages argued to derive from smaller scale and distance from markets. However, the pattern of investment served to erode Ravenscraig's technological advantages leaving the plant increasingly vulnerable to phased contractionary strategies which appeared to offer BS a lower cost route to supplying the same level of demand. The view that BS was engaged in a strategic phased retreat from Scotland was further strengthened by the publication in 1985 of the strategy document BSC: the Future. This paper announced the closure of Ravenscraig's dedicated finishing facilities at Gartcosh and implied a situation in the 1990s in which the Motherwell plant served as a denuded provider of slabs for further processing at other sites. Matters were further clarified by the statement of 3rd December 1987 in which BS set out that, subject to market conditions, the Ravenscraig steelmaking end and the Dalzell platemill would be required but that the future of strip rolling would be reviewed in 1989. In 1987-88, this phased retreat scenario was thoroughly tested for Motherwell District Council by management consultants Arthur Young. This exercise set out how BS could eliminate their Scottish operation without loss of volume by 1994. The report traced the exact dynamics of withdrawal drawing particular attention to the increases in capacity derived from debottlenecking the Welsh plants. The Arthur Young report concluded that "we estimate that the increase in BSC profits from these closures would be around £100 million per annum, compared to 'one-off' closure costs of redundancy and other cash costs of £50m net, and a capital write off of £130m for plant and equipment."(p:1)

The Arthur Young plant configuration forecasts have been vindicated by subsequent events. In

September 1988, BS announced the installation of a second concast machine at Port Talbot which should be fully operational in 1991. This leaves the Ravenscraig strip mill vulnerable to the poor short term outlook for strip products because the completion of this project provides BS with an additional 600000 tpy of concast based product. The Arthur Young view saw the potential to rationalise platemaking at Scunthorpe by 1993/94. To accommodate this, BS would require to commence the construction of any integrated platemill in 1990 or 1991. As set out in previous Commentaries, BS have taken a decision to remain in this market and have convened an internal working party to consider future platemaking capacity. This group was established in June 1989 and BS have always maintained that no conclusions would be reported before the middle of this year.

In our view, the Glasgow Study fails comprehensively to overturn the conclusions of the Arthur Young analysis. As is set out below, the report fails to substantiate 2 key conclusions set out in the executive summary.

#### (iv) British Steel's Investment Policy

"the apparent policy of BS to under invest in recent years in its Scottish plants compared to its other plants is not easy to explain in strict economic grounds." (Executive Summary p:1).

We view this assertion as an attempt to suggest that the series of investment decisions which have resulted in the present, precarious situation facing the Scottish Steel industry could not be justified on the grounds of a proper appraisal. To present a sensible case, the term "in recent years" requires to be defined elastically. In our view, the chain of decisions which currently serve to eclipse Scottish steelmaking are of an order of 9-10 years old. The Scottish Steel lobby was presented with its last meaningful opportunity to question the strategic assumptions in 1985 and did not take it. However, we will return to these considerations after a brief survey of the arguments which the Glasgow Study advances in support of this proposition.

The Glasgow Study makes 4 basic points relevant to the investment issue. First, "the Scottish plants have received only a small share of replacement and modernisation investment in recent years."(p:5) Second, the report cites the conclusions of the MMC evaluation of BSC with

respect to investment appraisal methodology. In this report, the MMC endorses the findings of the Warwick University analyses of the closures of steelmaking at Shotton and Corby conducted in the early 1980s for the ISTC. The Warwick study concludes that in these exercises valid alternatives to the preferred strategy were either not assessed or were burdened with adverse and questionable assumptions. In short, BSC appear to use appraisal techniques to support a preferred strategy rather than to help choose between plausible competing strategies. This prompts the authors to raise the possibility that "BS's investment decisions may not have been based upon systematic evaluation of the comparative profitability of investment at different sites and that the returns from locating investment projects in Scotland may not have received systematic appraisal." (p:8) Third, the report sets out that "the view that the Scottish plants suffer a comparative locational disadvantage does not bear close scrutiny either in terms of the Scottish plants' comparative advantage in importing raw materials or the Scottish plants' proximity to final users (including Shotton)." (p:8) Four, given the emerging trend of greater segmentation of product markets, the study argues that the smaller converters at Ravenscraig are "likely to be a positive advantage since it will allow lower cost production of small batches of high quality steels". The report continues that "such small scale production at [Port Talbot and Llanwern] is likely to be uneconomic" but that "it is in the low volume high quality end of the market that demand is likely to expand most rapidly"(p:22)

Taken together, these points in themselves are not sufficient to justify the above assertion and the report has been severely criticised on this basis. Whilst we accept that the Glasgow study does not convincingly or conclusively substantiate this point, we feel that there is a case to answer. As set out in Section (iii), the BS attitude towards its Scottish operations changed markedly shortly after the completion of the 1980/81 Corporate Plan in December 1979. In our view the critical decisions are those which sanctioned the modernisation of the Port Talbot HSM and the upgrading of Llanwern both at a time of substantial UK and global excess capacity in strip making. In the 1980/81 document, the relative strengths and weaknesses of each of BS's 5 integrated plants is set out. As pointed out above options which led to the closure of Ravenscraig were clearly rejected because "the main advantages

of Scotland over Llanwern will come from the concast facilities for slab production which is worth £20 tonne of hot rolled coil. In addition, the benefit of larger vessels at Hunterston partly offset the higher rail cost of moving ore to Ravenscraig compared with Port Talbot/Llanwern."(ISTC:p:110) The smaller Ravenscraig steel converters were viewed adversely but the secondary steelmaking and vacuum degassing facilities and the characteristics of the strip mill were viewed as strong points in the plants' favour.

Llanwern was viewed to possess 4 main strengths. First, "a new blast furnace rated at 5000 tpd". Second, "the best hot mill in the Corporation being a fully continuous mill with five large reheating furnaces capable of processing 3.5mt of liquid steel into 2.9 m tonne of hot rolled coil(mild steel) It was designed to produce coil weights of 1000lbs an inch of width which even for the narrower tin plate width produces large coils of up to 16 tonnes giving better yields in finishing mills and at customary works." Third, "the mills are closer to some of the Corporation's main customers."(ibid:p:109) Four, Llanwern was argued to have "a good reputation with users such as the motor industry"(ibid:pp:113). The plants weaknesses were to be found in the steelmaking and casting processes. It was noted that "all imported ore and coal has to come via Port Talbot where vessel size is restricted to around 100 Kt." and that 60% of the coke oven capacity "require replacing or substituting with imported coke." In addition, the document details the lack of vacuum degassing and concast facilities which "because of steel plant layout -would be costly to install"(ibid:pp:110) At Port Talbot the reverse was the case. The plant was a true coastal location with modern iron and steelmaking plant, secondary steelmaking and a slab caster under construction which would enable a throughput of 3 m tpy of liquid steel. The hot mill was viewed as poor with "serious limitations on coil weights and output"(ibid:p:110).

The optimal solution in the 1980/81 strategy was to use the Port Talbot steelmaking and casting operation in conjunction with the Llanwern mill. Any increased demand could be met by utilising Ravenscraig more fully by employing the third BF which was currently being rebuilt. The Document was not sanguine about the Welsh strip operations noting that "on the face of it, the plan leaves little capacity for increased production of hot

rolled coil if the mills are judged against recent performance." (ibid:p:116) This plant configuration and production potential was suggested to be "the best possible situation, having regard to the facilities as they exist and the limited financial resources likely to be available." (ibid:p:117) In our view, the factor that changed was the introduction in February 1980 of the EEC's code on state aid and subsequent revision of August 1981 which dictated that investment subsidies would only be authorised on the basis of clear programmes to restructure and reduce capacity. In our view, BS hatched the plan to modernise its Welsh operations and receive state aid on the basis that it would reduce capacity at other sites. Whatever the case, within 2 years of the publication of the 1980/81 Corporate Plan, BSC were proceeding upon entirely different assumptions and demanding that Ravenscraig be closed. This account indicates that the watershed decision appears to be the modernisation of the Port Talbot strip mill. Once this was taken, the small amounts of investment at the hot end and casting stage at Llanwern were always going to be justified in comparison with expansionary Scottish options on the basis of the superior potential of the mill and the proximity to finishing facilities. This also provides justification of programmes to modernise and construct strip finishing and processing facilities in Wales.

Given the prevailing forecast levels of demand, the 1985 decisions to install the Alpha Steel concast equipment at Llanwern and close Gartcosh compelled the conclusion that BSC had set in train forces which would inevitably result in the demise of steelmaking in Scotland. At the time, we viewed the issue as Ravenscraig versus Llanwern and were amongst those who felt that the campaign ought to have been conducted on this basis. With hindsight, it is almost certain that a Scottish option would have been validly rejected. However, we were advised that such a course was unacceptable to the Scottish Steel Lobby which felt compelled to reject any arguments which challenged the existing 5 plant policy of the steel unions and the various political groupings. In the event the focus of the reaction to BSC; The Future became the Gartcosh Mill when the central issue related to whether it was more sensible to debottleneck Ravenscraig or upgrade Llanwern. Thus, strategies based on featuring the locational merits of the Scottish operation were both likely to fail in the 1980s but would have proved

unacceptable to the Scottish Lobby including the sponsors of the present Glasgow Study.

The 1985 decision provided the last opportunity for Scots to mount a coherent case based upon the BF-BOS technology. Following this, unless it can be demonstrated that BS require a steelmake greater than the potential afforded by its other 4 integrated plants, the Scottish operation is vulnerable to the argument that a similar throughput can be produced at lower unit cost by transferring production from Scotland. If the Glasgow criticism of unsystematic strategic evaluation has any force, the approach requires to be applied to the curious decision to modernise the Port Talbot HSM in the early 1980s. In our view, this changed the strategic position of Ravenscraig irretrievably by setting it against the superior capacity at the more optimal Llanwern location. After the Port Talbot decision, we would strongly refute any suggestion that BSC's investments could not be vindicated on the basis of a fair appraisal because the best available forecasts of demand suggested that Ravenscraigs steelmake could be readily dispensed with.

In our view, the absence of significant Scottish investment from the early 1980s onwards is neither surprising nor unwarranted. From BS's standpoint, no capacity enhancing investment would prove cost effective. In addition, Ravenscraig started the 1980s as BSC's most technologically advanced plant. The other plants required to catch up and this process is all but complete. The salient strategic issue relates to where this investment dynamic leaves the Motherwell operation in the mid 1990s. After that point, coke ovens will require to be rebuilt and blast furnaces relined. These are a set of costs about which the Glasgow Study falls silent. If BS are to persevere with Ravenscraig into the 21st century it would require a rolling programme of investment at the Motherwell plant. It is at this juncture that the old steelmaking technology becomes vulnerable to the new. No strategic appraisal of Scotland's steel industry can validly ignore this fact.

(v) The Platemill Decision.

"It would be in the interests of the shareholders of BS if one of the Scottish options was chosen ie upgrade Dalzell or put a new mill at Ravenscraig." (Executive Summary:p:2)

We do not accept that this case has been

substantiated by the Glasgow Study. However, it is our view that the following conclusions should be accepted without reservation. First, that Dalzell compares favourably with all its European counterparts in terms of product range and quality. Second, that with investment of between £80m and £110m, Dalzell could be transformed into an even better mill offering an enhanced range of products more efficiently. Indeed, we view the Report's demolition of the BS view that Dalzell is an ageing platemill to be both cogent and well directed. However, the aforementioned paper by Mr Ted Ramsay argues that BS will not favour an inland location because of the constraints placed upon the product range by the overland transport system. This could emerge as an argument in favour of Lackenby which is the only truly coastal site under consideration. The Glasgow Study makes no comment and implicitly assumes that the product range required will be similar to that presently marketed. Third, we accept that it would be more expensive to construct an integrated platemill at Lackenby or Scunthorpe compared with Ravenscraig because of a requirement for greater expenditure on concast machines and reheating furnaces.

Whilst we accept these key conclusions and much beside, we do not consider that they constitute an illustration that the Scottish options provide the best solution for BS shareholders. The problem with Glasgow the analysis is that despite some favourable evidence, the platemill decision has not been placed in its proper context. A critical deficiency is that the report fails to demonstrate conclusively that BS will need Ravenscraig's steel output. A version of the Arthur Young analysis appears to be favoured by BS who have presented a similar account at various points in the recent past. Thus, the conclusion which must be overturned relates to whether it is still the case that BS can produce its desired steelmake with lower unit costs using 4 integrated sites as opposed to 5. Despite limited sympathy with the view that Ravenscraig's smaller steel converters ought to be more favourably regarded than in previous BS assessments, we would argue that the key issue is that of demand. A refutation of the Arthur Young conclusions requires a clear demonstration that BS require a steelmake beyond the potential of its 4 English and Welsh operations.

The Glasgow Study provides a review of the general outlook for world, European and domestic demand.

In addition, Chapter 3 sets out a useful summary of the approaches to demand forecasting employed by the ECSC in formulating their General Objectives for Steel 1995. However the material presented supports only the general conclusion that 'demand prospects for steel are favourable'. In our view, the Report fails to provide a sufficiently detailed discussion of the evolution of either UK steel demand or the demand for BS's product range. Instead, a set of propositions are elaborated and the following line of argument established. Demand prospects are favourable. The UK market has been subject to increasing import penetration and BS increasingly commands a smaller proportion of its home market. In recent years, the average value per tonne of UK imports has been greater than the average value per tonne of UK exports. These facts are not in dispute. However, the Glasgow Study merely rests content in presenting this information but does not indicate what conclusions should be drawn. It is our contention that the researchers set out this data to imply that there are profitable markets both at home and abroad which BS could serve and thus increase the probability that it will require its Scottish operation. If this is the motive, then it is our view that further analysis is both needed and warranted to substantiate the point.

At present, the oxygen converters at the 5 BS integrated plants can produce a steel output of circa 17.7m tpy. If one allows for upstream and downstream constraints, the effective steelmaking capacity of the 5 works is circa 16.8 tpy. This consists of 4.4m tpy at Scunthorpe, 3.6m tpy at Teeside, 3.2m tpy at Port Talbot following the commissioning of the second caster later this year, 3.4m tpy at Llanwern and 2.2m tpy at Ravenscraig. Thus, without Ravenscraig, BS can produce a maximum of circa 14.6m tpy. BS's liquid steelmake out-turned at 14.70 mt in 1988 and 14.21 mt in 1989. Indeed, in the financial year 1988/89 BS produced 15.4 mt of liquid steel. These volumes include BS's relatively small electric arc capacity and must therefore be adjusted. Taking this into account, we estimate that BS's oxygen converters processed approximately 14.1 mt in 1988, 13.6 mt in 1989 and 14.7-14.8 mt in 1988/89. Thus, at the end of the previous decade, British Steel operated at levels close to the maximum which would be permitted without Scottish production.

Although a survey of Scottish steel users has been undertaken, the results were not presented in the

final report. Thus, the Report concentrates its efforts at the European level and presents some discussion of the ECSC assessment of future global and sectoral demand. On average, the European economy is forecast to grow by 3.0% p.a. and steel demand by 1.3% p.a. Production is estimated to rise from a total of 137m tpy in 1988 to between 138-143m tpy in 1995. The output of ECSC products is forecast to rise from 111.7m tpy in 1988 to 114.7m tpy in 1995 following a fall to 110.7m tpy in 1992. Thus most of the modest forecast net growth in EC steel demand is absorbed by increased third country imports. This can be justified with reference to the elimination of import quotas which the Community intends to enforce during this period. As implied above, both demand and output growth are projected to decline or stagnate in the 1990-92 period and recover thereafter. Indeed, some forecasting bodies estimate that this recovery will be strong. Thus, US market analysts Paine Webber have argued that, in terms of the world steel market, "there would be a sharp rebound of pricing and a return to steel shortage conditions in 1991-92."

The product range is a key corporate decision. BS's broad criteria for remaining in a market segment relates to the ability to operate existing or proposed plant at high levels of capacity utilisation supplying product which can be marketed at a specified margin. Post privatisation, BS have embarked upon a review of their product range and this has already resulted in both contractionary and expansionary programmes in certain areas. The importance of this to the Scottish issue is the demonstration that changes in the supply policy of products not currently produced in Scotland will affect the overall steel requirement and thus the likelihood that Ravenscraig's capacity will be required.

Even allowing for a favourable general market outlook, the evolution and future profile of the product range is subject to considerable uncertainty. At present, BS produces circa 2.5 tpy of semi-finished product. The vast majority of this is sold to producers which used to be part of BS and in which BS has some form of equity stake. In addition, circa 0.4m tpy of slabs are dispatched to a US associate. At present BS does not sell substantial volumes of semis on the open market although if prices were strong BS could use its excess steelmaking capacity in this segment. Second, there have been decisions to remain in the markets for plate and welded tube which have

resulted in BS seeking to buy surplus foreign capacity for installation in the UK. The decision concerning seamless tube is imminent. In terms of strip products the picture is mixed. BS faces ongoing difficulty with respect to tin-plate due to corporate rationalisation of the packaging sector. This serves to reduce the required production of strip and has implications for Ravenscraig. Although Continental markets will be generally stronger, BS is forecast to experience reduced demand from the UK Motor industry in the next 2 years. In principle, the UK car industry could export this problem away but recent data suggests that some abatement in strip demand from this source is likely in the short term. However, the medium term outlook for the UK automotive sector is favourable. By the mid 1990s, 3 new Japanese car plants supplying an additional 500000 cars will be onstream. Toyota have recently indicated that they are seeking a further European site and that the UK is a strong contender. Ford intend to step up the production of luxury cars through expansion of activity at Jaguar although offsetting contraction of volume production is likely.

As set out in last quarter's Commentary, the UK domestic market is likely to decline more sharply than its Continental counterparts. However, most UK macro forecasts suggest that British exporters will be faced with a favourable exchange rate trend. Given that BS is widely regarded as one of the world's more efficient producers, one could suggest that BS and its customers ought to be able to increase penetration of continental markets. However, BS has recently announced price rises across much of the flat product range at a time of ongoing production pauses in Community markets. Whilst this will protect margins, it will facilitate greater import penetration and check the rate of export growth. Further price rises are expected in the second quarter. This behaviour illustrates that the level of production can be manipulated by BS and that it is profit and not output which will be maximised in the coming decade. As these pricing decisions largely relate to strip products we cannot be confident about the future of the Ravenscraig strip mill once additional concast product becomes available at Port Talbot.

Contrary to the impression given in the Glasgow report, BS's share of the market for its product range actually increased between 1987/88 and 1988/89 and stands at 62.2%. This is extremely



high by European standards. The recent acquisitions of UK stockists should help consolidate this position although the proposed purchase of the Walker Group is subject to an EEC inquiry. Should BS succeed in acquiring the lions share of the UK stockholding market, it has the potential to engender further penetration of the domestic markets within its product range. However, the potential of this source of growth is likely to be modest in comparison with the potential afforded by greater penetration of EC markets. Again our analysis is subject to considerable uncertainty. As set out in previous Commentaries, BS has been acquiring Continental distributors and steel processors. At present BS are known to be in discussion with both Klockner and Hoesch concerning purchase of mills and joint ventures in strip coating facilities. As long as BS does not acquire steelmaking capacity, then these events may work to the possible benefit of Scotland. The purchase of German rolling mills, investment in a part share of the throughput of a new German strip coating facility and greater access to the German distribution network could engender dramatic increases in the capability to export semis and part processed material as well as final product. In our view, the UK will remain a low cost base from which to market such output.

Thus, demand in BS's domestic market is set to grow slowly during the 1990-95 period following a sharp slowdown in the first part of this time horizon. European demand is projected to grow modestly but output stagnates owing to increased import penetration of EC markets by third countries following elimination of tariff barriers. BS are pursuing strategies designed to increase its capability to compete in Continental markets and has a favourable cost and exchange rate environment in which to base this exercise. The EC seem determined to fashion a liberalised Community market in which BS is in a strong position to outperform most of its Continental rivals. However, recent pricing and product policy serves to indicate that BS executives intend to reduce production in areas where margins are poor. This implies that BS may favour a strategy which reduces production to levels at which a higher expected rate of return can be generated by working remaining capacity at consistently high utilisation rates. In short, BS will choose to slim down to a smaller better integrated and more efficient configuration which can operate with high load factors in high margin segments in most likely states of the world. Thus, the optimal size

of BS is an issue that requires further detailed study.

In our view, the situation has improved dramatically since the Arthur Young Report was conducted. In the AY scenario expected demand in the middle of the 1990s was such that Ravenscraigs steel output was neither required nor likely to be required in the latter part of the decade. BS could easily fit Scottish production at other sites with little scope for contrary analysis. Previous Commentaries have documented that, since 1987, demand has consistently evolved more strongly than all international forecasters predicted. In particular, BS Chairman Sir Robert Scholey has commented on several occasions that BS viewed production to be rising above the long run trend. Given BS's success in this period and despite the adverse short term situation it is possible to argue that BS strategies could result in a steelmake of at least 14.2-14.3M tpy in 1995 with the prospect that demand will grow strongly in the subsequent 5 years. That case has yet to be fully established. However, our discussion of recent BS activity should stress that the optimal size and loading of BS capacity is a choice variable and that these choices are being exercised at the moment.

These considerations are highly relevant to the options put forward by the Glasgow Study. In our best possible scenario, the option to integrate the platemill at Motherwell by constructing a new mill on the Ravenscraig site is a clear non starter. Our best assessment of demand in 1995 is that it will attain the levels reached at the end of the decade. Given the ongoing evolution of supply, this suggests that BS will not at that point require Ravenscraig's steel production. To justify this option, one requires to demonstrate that BS will see the need to continue production at its fifth site and that this case will be so clear that BS will be prepared to modernise the iron and steelmaking capacity. Even if the case can be made that BS can operate in the long run with sufficient good margin business to support a steelmake in excess of 16M tpy the impact of new technology in the Scottish context must be assessed. If BS is going to have access to a new steelmaking process from the mid 1990s, it will not wish to refurbish BF-BOS operations. Thus if a case for a steelmake greater than the potential of the 4 English and Welsh operations can be made, the best integrated option would involve the new technology. In our view, the Glasgow Study fails

to justify its conclusion that an integrated plate mill is in the best interests of BS shareholders because it does not demonstrate that BS will need all or part of the supply potential at Motherwell. In reality, Scottish options based on new technology would dominate this option if an accommodating level of demand can be established.

There remains the possibility that an upgrade of the present Dalzell mill may prove more an attractive strategy. This is correctly identified by the Glasgow study as a low cost means of supplying future plate demands. Abstracting from the issue of whether BS could produce and market the future, desired product range at a refurbished Dalzell, this presents a strong option. In principle, Dalzell could exist as an island site fed by Lackenby or other works if Ravenscraig were to be closed. A similar strong option not considered by the Glasgow Study is the refurbishment of the Appelby Mill at Scunthorpe. Whilst this presents higher costs in terms of casting facilities and reheating furnaces, these may be lower than those suggested by the Glasgow research if Scottish facilities can be cannibalised. This option presents the prospect of energy savings and net lower transport costs in production and distribution. Such streams of benefits would serve to offset the project cost advantages which could be identified for a stand alone Scottish plate mill. A demonstration that a detached, refurbished Scottish plate mill is a superior option to a refurbished Scunthorpe plate mill has not been set out by the Glasgow Study. Indeed the refurbished option considered in the Glasgow Study assumes invalidly that a supply of slabs from nearby Ravenscraig will be costlessly available over the time horizon of the project. As set out above this has not been established and failure to do this implies a set of costs accruing to an island site not considered by the Glasgow researchers.

Thus, unless strong evidence can be provided which indicates that BS see a continuing need for a steelmake in substantial excess of 14.6M tpy, we would suggest that the view that Scottish plate mill options are in the best interests of BS shareholders must be rejected. In this situation, the integrated Motherwell option is a clear non-starter and the island Dalzell option likely to be dominated by a Scunthorpe upgrade. If such evidence exists, the impact of Direct Smelting would require to be assessed. In these respects, it is our view that the Glasgow Study has failed

to set the Dalzell decision in proper context and has failed to provide evidence to support the case for continuing plate production in Scotland. It is not possible to isolate the plate mill decision from a wider set of demand and technical issues. The explicit and invalid attempt to do this results in an incorrect and limited analysis of the prospects for the Scottish Steel industry which serves no-one well.

#### (vi) Concluding Remarks.

In the December 1989 Commentary it was suggested that the previously solid Scottish Steel lobby has irretrievably fragmented. Thus the Ravenscraig shop stewards did not support or co-operate with the body which commissioned the Glasgow research. It has been suggested to us that, because of this split, those commissioning the study did not wish their consultants to discuss steelmaking or strip making but instead to concentrate narrowly on the plate mill in isolation from the influences shaping the remainder of the Scottish sector. Our message to all concerned is that BS will not take the plate mill decision on criteria which reflect the politics and demarcations inherent within the Scottish lobby. An explicit and direct attempt to overturn the Arthur Young dynamic was called for. This involves a holistic approach to BS and the Scottish situation culminating in a clear and detailed demonstration that BS need a Scottish steelmaking operation. This has not emerged and is one major source of criticism of this study. We accept the broad message concerning lower Scottish project costs but cannot support the conclusion that this demonstrates that BS best interests are served by proceeding on this basis. This is because the steel supply for a new or modernised Scottish plate mill implies a set of costs which have not been quantified. Thus, the conclusions set out in the Glasgow Report with respect to platemaking are correct only in a limited and artificial context.

As with the Gartcosh episode, it is not appropriate to view the plate mill as the significant issue. Ultimately, this will be located near to a source of long run steel supply and this is what requires to be justified in Scotland. If one can conclude that it is in BS's best interests to produce steel in Scotland then a case for plate mill and other developments is soon substantiated. The Glasgow analysis fails to determine this.

In our view, the enduring value of this paper is the emphasis on fundamentals. Scotland has advantages in steelmaking which largely derive from the existence of the ore terminal at Hunterston. This was engendered by BS via the 1973 10-Year Development Plan and recognised as recently as the 1980/81 Corporate Strategy. Our research over the last 8 years has never sought to deny this. However, it was and remains our view that these advantages are offset by the savings afforded to BS by retreating from Scotland and that this has been the case since the decision to upgrade Port Talbot taken in the early 1980s. In our view demand has evolved favourably to the extent that in the late 1990s BS could be operating at production levels which justify investment in Scottish steelmaking capacity. It is our long-standing view that, if this can be demonstrated satisfactorily, the best case for the Scottish Steel industry relates to, and possible the adoption of, direct smelting technology which can be argued on the basis of an additional set of dynamic efficiency grounds. Thus, a second major criticism of the Glasgow Study pertains to the short sighted and invalid treatment of the technological issue.

The fragmentation of the Scottish Steel lobby has resulted in the emergence of a clear grouping dedicated to advancing a new technology case. This consists of a number of former BS officers led by Sir Monty Finnieston. In addition, these figures tend to be members of the Liberal Democrats. Finnieston was the architect of the 1973 Corporate Plan which secured the construction of facilities at Hunterston. The endpoint of this plan was the ultimate closure of the BF-BOS plant at Motherwell and its replacement by direct reduction-electric arc methods of steel production based at Hunterston. As Love and Stevens(1989) sets out, this grand plan was abandoned in 1978 and the consequences of its partial completion by that date have afflicted the prospects of the Scottish operation ever since. In the original version BS located Scottish production at Hunterston, following the Port Talbot/Llanwern modernisations the most likely outcome for Scotland has been a no technology rather than a new technology endpoint.

In the mid 1980s, we served as advisers to a Commission chaired by Sir Monty Finnieston which sought to establish whether a new technology argument could be sensibly put. The impetus for this derived from statements made by BSC Chairman Sir Ian MacGregor on the future role of Hunterston

during a visit to the Glengarnock Works in 1983. MacGregor claimed that BS would perfect a world beating process based upon the DR technology presently unused at Hunterston and would supply world markets from that location. At that time, we viewed that a process of coal gasification to activate an economic DR-EA route lay behind this statement. By the mid 1980s we had discovered that BS were involved in developing the direct smelting technology discussed above. However, we viewed that the depressed and protection distorted world markets were not favourable to the concept of a remote export-oriented Scottish coastal plant and that Hunterston was ruled out by market considerations. Love and Stevens(1989), written in Autumn 1988, reflected fully both this view and the Arthur Young scenario, and concluded that Scottish Steel production was doomed to end in 1993 or 1994 in an environment hostile to the Hunterston concept.

Events have persuaded us to re-examine our position. First, the Arthur Young scenario has turned out to be too pessimistic. Although further research is needed BS prospects appear such that an argument based on demand and new technology is worthy of serious consideration. Whilst, it is our view that the Glasgow Study establishes clearly that the optimal Scottish location for BS would be Hunterston, a wider set of social considerations would substantiate a case for Motherwell. The refurbishment of Dalzell could be better grounded on a supply of feedstock from a direct smelter in Scotland. Second, an end to the protectionist status of both the US and EC markets appears likely by the middle of the decade. Third, the work of both Mr. Ramsay and the Glasgow researchers persuades us that Scotland has a case to present within a British Steel context. Because all of the raw materials for steelmaking require to be imported from other continents, there may be a cost advantage to be derived from transporting semi-finished and processed goods from a peripheral location to finishing facilities and final customers nearer or at the centre as opposed to transporting ore etc to central steelmaking sites. Given BS's European strategy of buying or developing continental finishing activity this argument will continue to gain force.

Steelmaking is a high technology activity which Scotland should relinquish with great reluctance. Those who make reference to steelmaking in terms of a declining, low-tech and expendable Scottish activity misread the global situation. There will

be a continuing need for steel and this will be produced to increasingly exact properties for an increasing set of uses. This will be undertaken in furnaces and mills of ever increasing technical sophistication. In principle, as the Glasgow Study concludes, Scotland has the potential to be a sound base for steel production. Their mistake is to attempt to support old technology and relatively inferior locations. This serves to distort the key message in the study that Scotland is a good steelmaking centre. This has been engineered by the 1973 Development Plan and the issue for Scotland is if and when this thinking will be pressed with full effect to BS by Scottish interests. If a Scottish steel industry is to survive through the 1990s the Scottish lobby must

identify the strongest case. For BS, development of new technology is a major global player in the 21st century. Both new technology and no technology end points present the same implication for North Lanarkshire. At least in the former case, Scotland stays in the game.

#### References

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