

ECONOMICS OF MANAGERIAL DECISION-MAKING

G.P. MARSHALL AND B.J. McCORMICK

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Basil Blackwell

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First published 1986

Basil Blackwell Ltd
108 Cowley Road, Oxford OX4 1JF, UK

Basil Blackwell Inc.
432 Park Avenue South, Suite 1503
New York, NY 10016, USA

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British Library Cataloguing in Publication Data

Marshall, G. P.

Economics of managerial decision-making.

1. Decision-making

I. Title II. McCormick, B. J.

658.4'03 HD30.23

ISBN 0-631-13187-6

ISBN 0-631-14312-2 Pbk

Library of Congress Cataloging in Publication Data

Marshall, G. P.

Economics of managerial decision-making.

Includes index.

1. Managerial economics. 2. Decision-making.

I. McCormick, B. J. (Brian Joseph) II. Title.

HD30.22.M38 1986 658 86-3562

ISBN 0-631-13187-6

ISBN 0-631-14312-2 (pbk.)

Typeset in 10/11 pt Ehrhardt by Photo-Graphics, Honiton, Devon
Printed in Great Britain by T. J. Press Ltd, Padstow, Cornwall

Acknowledgements

We are grateful to Philip Allan for permission to reprint table 3.6 from J. Pickering and A. J. Cockerill (eds), *The Economic Management of the Firm*. An earlier version of the chapter on personnel management appeared in the Pickering and Cockerill volume. Our thanks are also due to Graham Ray and Joe Smith for permission to reprint figures 6.3–6.5 which originally appeared in *Hardy Heating Ltd*, and subsequently in a revised version in *Hardy Developments Ltd*. Arthur Francis and the editors of *Sociology* have allowed us to use figure 3.4, and the Syndic of Cambridge University Press gave permission for us to reprint figures 5.2–5.4 from A. D. Chandler's chapter in the *Cambridge Economic History of Europe*, Vol. 7, Part II. We are also grateful to the Oxford University Press for permission to reproduce the discussion of linear programming from P. W. Bell and M. P. Todaro, *Economic Theory*. We would like to thank the editors of the *Journal of Consumer Research* for permission to reproduce figure 8.9, the editor of the *Journal of Industrial Economics* for permission to reproduce figure 12.5, and Elsevier Science Publications for figures 15.1–15.3.

Our chief intellectual debts are to Harry Townsend and Jack Gilbert. We have benefited from discussing business history with John Mason. Our understanding of the Japanese economy (as well as our prowess at snooker) owes a great deal to the patience of D. W. Anthony and G. Healey of the Sheffield Centre for Japanese Studies. Our debt to Dan Hemmings will only be apparent to the Sheffield coterie of finance students.

Finally, we acknowledge the enormous debt we owe to Linda and Monica who have had to bear the brunt of the burden of preparing the manuscript.

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1 Introduction

Neoclassical economics is a moving target and its continual recreation can be a source of confusion to both practitioners and critics alike. Hence, we begin with an explicit statement of our objective. We are interested in the economic management of firms in advanced economies. We draw therefore upon Lewis's distinction between the core and the periphery of an evolving world economy (Lewis, 1978). The firms we are interested in are those to be found in the core of the international economy in the last quarter of the twentieth century. However, even within the core there are differences. Some economies, such as the United States, are leaders – scratching away at the technological frontier. Others are followers: Japan, Britain, Germany and Sweden, for example. Some are catching up rapidly whereas others appear to be stagnating. Each country, although a member of the core, has a different cultural background which exerts a considerable influence upon the behaviour of firms in the international economy.

The firms of our core differ from those which Alfred Marshall discussed in his *Industry and Trade* (1923) because the passage of time has brought new issues and new countries into the core. Marshall was concerned with the weakening of Britain's industrial performance but saw hope in that independence of character which was the British characteristic. He noted the emphasis upon education in Germany, the stress upon individuality and artistic skills in France and the drive towards multiform standardization in the United States. Were he alive today, however, he would have noted the enlargement and bifurcation of the core and the increasing involvement of the periphery in the world economy. He would, perhaps, be inclined to stress the importance of job rotation and forms of industrial cooperation in Japan. He would have observed that the forces of industrialization and trade which had ignored national boundaries and achieved a peaceful conquest and integration of Europe in the nineteenth century had been checked by the bifurcation of Europe as well as other parts of the world economy, into a core of market economies and a core of planned economies, each with its attendant periphery.

Chapter 2 is about a very neoclassical theme: the theory of trade; but it is the exchange theory of an advanced economy, probably the United States, possibly Japan, Britain, West Germany, Sweden, France or Australia; it is not the nineteenth-century theory of trade of Walras or Pareto, although their ideas serve as a starting point. Instead, it deals with the more recent pre-occupations of advanced economies. First there has been the persistent

(Keynesian) problem of whether an economy can maintain full employment of resources. Second there has been the question of whether the state has to finance and produce some goods and services. Arising out of these two issues has been the general question: how do buyers and sellers assess the qualities of goods? To determine prices it is first necessary to determine what the goods are. Hence in chapter 2 we draw upon the burgeoning literature of informational economics. What this literature emphasizes is the importance of merchants and the institutions which make markets work. In the 1950s and 1960s economists completed the task of delineating the assumptions required for an economy characterized by certainty. In the 1970s and 1980s they have increasingly turned to uncertainty and in doing so they have come to a realization of what sociologists such as Dore (1983) have called 'relational contracting', the awareness that trade is not conducted by anonymous agents, by 'city men', but by individuals who operate in a cultural and social milieu which ensures a climate of trust.

Chapter 3 introduces the firm as a bundle of contracts between resource owners, which overcomes some of the disadvantages of using markets. The disadvantage to which special attention has been directed is the problem of the behaviour of workers. This raises the further issues of: What should be the nature of the contracts between resource owners? Does monitoring imply a hierarchical structure? What should be the goals of firms? What is the nature of entrepreneurship? Are the contractual relationships between resource owners the same in all countries within the core?

Chapter 4 looks at the problems of strategy as a firm moves through a life cycle of birth, maturity, decline and, possibly, death. The concept of a life cycle of a firm was introduced by Marshall in the context of a nineteenth-century world of family firms which went through a cycle of 'clogs to clogs in three generations'. In Marshall's industries some firms were struggling to obtain a foothold, others had reached maturity and some were declining. Because of the complex nature of an industry, the industry supply price was determined not by the marginal firm but by a representative firm which enjoyed the advantages of economies of scale. Hence Marshall could assume that the size of the industry was given, even though the composition of its firms could be continually changing. Marshall's concept of a representative firm was subsequently criticized for its neglect of internal economies of scale and the possibilities of monopoly, both of which might emerge with limited liability and the growth of markets. (In *Industry and Trade* Marshall did show an awareness of these issues.) For later writers, such as Sraffa, Robinson and Chamberlin, the emphasis was to shift away from the industry and the representative firm and towards a more detailed, axiomatic, treatment of the firm; and with this shift, and the belief that markets were becoming more oligopolistic, there has been a revival of interest in Cournot. However, we defer consideration of Cournot until chapter 8 because we think that the life cycle remains a useful concept. Joint stock companies in the late twentieth century have undergone senility and decay.

Chapter 5 returns to the theme of chapter 2: what is the nature of the firm? What is its structure? Weber explored the problem of bureaucracy and most

subsequent work has been an amplification or criticism of his ideas. Hence the first theme of chapter 5 deals with Weber and his critics. The second theme is the evolution of firms' structures in the economies of the evolving core. The two themes are linked because scientific management, Theory X, formed the leitmotiv of the core economies of the nineteenth and early twentieth centuries, whereas sociotechnical systems, job rotation, workers' cooperatives and Theories Y and Z have emerged in the late twentieth century and particularly with new core countries, such as Japan.

Chapter 6 is concerned with the usefulness of accounting information as a guide to decision-making. It begins with the problem of designing the firm's structure to elicit information and control the firm. It goes back, therefore, to some of the issues of the previous chapter and presents them in a cybernetic framework replete with feedback, filters and Ashby's law of requisite variety. From the insights gained the chapter goes on to consider the limitations of financial accounting information.

Chapters 7 to 11 deal with specific areas of management, with functional areas. Chapter 7 presents a brief introduction to the changing patterns of marketing. Chapter 8 deals with the central problems of marketing. What do consumers want? How do they set about satisfying their wants? How might consumers respond to various marketing inducements? Successful marketing depends upon a knowledge of marketing structures, and chapter 9 places the problems of consumer behaviour within the context of market structures involving different numbers of firms. In chapter 10 the emphasis is upon product policy. Finally, chapter 11 concludes the discussion of marketing with an examination of the channels of distribution (internal as well as external) and location policy.

In chapter 12 the emphasis is switched away from *what* to produce to a consideration of *how* to produce – to production management. It begins with a general statement of the optimal production plan as set out in neoclassical economics (or, as it is sometimes called, classical programming). All combinations of factors are technically feasible (the 'putty' assumption) and the choice of techniques is then dictated by relative factor prices. The alternative assumption of fixed factors is then considered. Classical programming and linear programming may be treated as one-period models; but a detailed analysis of the multi-period problem requires an examination of network analysis. From sequential programming we move on to consider inventory theory and queueing problems. To this point it has been assumed that there are no problems surrounding the quality of the product. In production management texts it is assumed that quality control can be ensured by statistical sampling; but this is a Western (scientific management) approach which assumes that workers cannot be trusted, and is contrasted with the Japanese Kanban method in which workers are induced to produce a high-quality product and inventories are minimized through the use of quality circles and job rotation. Although the Japanese had a reputation for poor quality in the 1950s, present-day Japanese methods reach quality standards which seem unattainable to their competitors.

Chapter 13 introduces personnel management problems with a discussion

of the hiring of labour. The difficulties of transforming the abstract marginal productivity principle into an operational tool of decision-making are explored. The treatment of hiring policies is extended to such issues as assessing the efficiency of labour before employment, overtime and short-time working and shift working. But management also need to consider the possible response of workers to inducements, and the theory of labour supply is elaborated. In many advanced countries wages are determined by some form of collective bargaining, and the next issue to be examined is the behaviour of trade unions and their effects upon wages and productivity.

Chapter 14 concludes the detailed examination of specific or operational areas of management by looking at investment and financial management. The emphasis is not upon accounting procedures but upon the determination of asset prices in a general equilibrium framework. However, present values are determined in the financial markets of different core economies and there is a brief account of different financial markets. The initial problem is then considered to be the determination of forward rates as a guide to future spot rates for assets. The establishment of forward rates then leads in to the establishment of appropriate investment procedures, and investment management is then linked to marketing and production management. Having established criteria for investment appraisal the discussion then turns to appropriate methods of financing, and involves a consideration of debt and equity finance and dividend policy. Finally, the problems of cash management are outlined.

Chapters 15 to 17 deal with the problems of particular types of firms. Chapter 15 examines the problems of multinational corporations; chapter 16 briefly discusses workers' cooperatives; and chapter 17 analyses the problems of public enterprises. These chapters are necessarily shorter than the previous ones because they rely upon the analysis of earlier chapters.

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2 The Propensity to Truck, Barter and Exchange

Within the context of this book we look at *trade* because it represents an alternative method of allocation to that of *diktat*. A discussion of trading enables us to understand both why firms emerge as an organizational alternative to resources being allocated through markets, and why well-established firms continue to use the market mechanism for certain allocative tasks.

Economics is the study of trading relationships. Why do agents trade? The simple answer is: because trade confers mutual benefits upon the participants. Crusoe and Friday have populated many textbooks with their illustration of this proposition. Crusoe, alone, is dependent upon his own skills in applying a crude technology to the meagre resources available on the island for the production of those goods which will satisfy his basic wants. Assuming that Crusoe likes any sort of food we can simplify his problem to one of how much fish and how much fruit to produce. The solution to the problem lies in deriving his *production* possibilities curve, which traces out the maximum outputs permitted by his technology, skill, effort and time. Given the availability of fish and fruit on the island and the absence of trade, this curve confines his *consumption* possibilities.

Where in the set of consumption opportunities does Crusoe locate himself? Clearly we have no idea about this unless Crusoe tells us, or we have a model of his behaviour which offers a good approximation to how he makes consumption choices. We shall return to the question of *how* to model consumption behaviour in a later chapter; for the time being let us assume that we can represent his actions as determined by a 'preference map'. It might be thought that *economics* begins here – formerly we had Crusoe the *engineer* mapping out his production alternatives but now we have Crusoe the *economic agent* who has to make a choice in relating his consumption wants to production possibilities. This view of what constitutes economic behaviour is best illustrated in Lionel Robbins's famous definition of economics as a (human) science dealing with the relationship between various ends and the scarce means of obtaining them (Robbins, 1932). However, it might be argued also that if we model Crusoe's behaviour on the assumption of a given set of preferences, then the problem remains within the competence of the engineer, at least to the extent that he is an applied mathematician – the problem is reduced to one of optimizing or maximizing (a preference function) with given constraints.

This is an argument which has been well expressed by James M. Buchanan (1979).

Buchanan's argument is very persuasive. Economists do need some of the skills of the engineer and, in particular, to understand the analytics of optimizing behaviour in the face of constraints; but economics must go beyond this to find its own identity and its own contributions to the understanding of human behaviour. On the desert island the real *economics* (or the real *symbiotics*, if we follow Buchanan completely) emerges only when we consider the appearance of Friday, for only then does Crusoe form an association with someone else which is based on *exchange* or *mutual agreement*. The association is formed because it is to the mutual advantage of the parties in terms of their social needs and their material wants. It can be demonstrated quite simply through the Ricardian principle of comparative advantage that, as long as the parties to an exchange obtain commodities at relative prices which are cheaper than their respective marginal costs of production, then trade confers more mutual benefits than autarky.

Trade and 'Efficiency'

Of course the Ricardian principle does not mean that material gain explains the motivation behind all trade, nor does it suggest that benefits from trade will be distributed equally between trading partners. Real-world exchanges demonstrate very often that social and political motivations for trade are common, and that bargaining strength and skill can influence the rate of exchange between commodities, etc. However, the principle established relates to the *potential* gains, regardless of their relative amounts, inherent in exchange which is based on comparative (cost) advantage. While recognizing that relative gains from trade can differ it might nevertheless be argued that comparative cost trading is efficient in the sense that each participant becomes better off in material terms – either because the same quantity of goods as before can be consumed now at a lower outlay – or because the same outlay as before will buy more goods now. Thus, by opting for trade rather than autarky each participant chooses a more efficient method of satisfying material wants.

We should note here that 'efficiency' is not a term to be used without caution. Very often the term seems apt in the circumstances but, equally often, a closer inspection reveals a meaningless adjective. Consider, for example, two of the activities which we have assumed Crusoe to be concentrating on so far – production and trading. His production 'problem' was described in terms of deriving a production possibilities curve from available resources and technology and normally, therefore, this is considered as a 'technological' issue. To go further, 'technological efficiency' is usually believed to be achieved along the production possibilities curve, or 'transformation frontier', rather than inside it, since from any point inside the frontier it is possible always to move to another point on the frontier by raising the level of employment and without suffering the goods trade-off which is the cost of any movement *along* the frontier. Figure 2.1 summarizes for the case of increasing (marginal) opportunity cost.

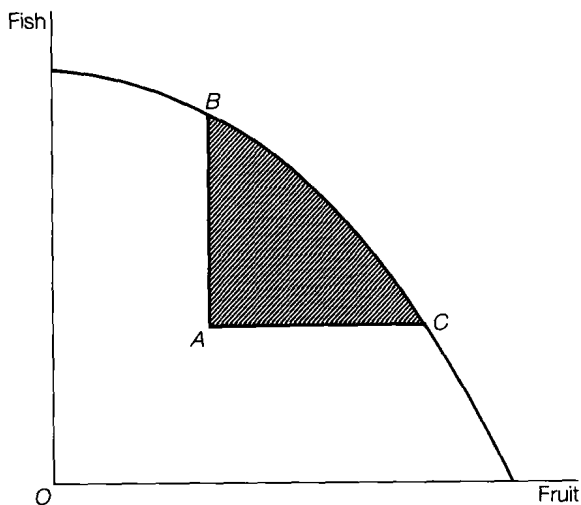


Figure 2.1 Marginal opportunity cost. A to B: more fish, no fruit trade-off; A to C: more fruit, no fish trade-off; B to C: more fruit, less fish; C to B: more fish, less fruit.

Figure 2.1 is the standard diagram of economics textbooks, showing that movements from *A* towards *B* or *C*, or towards anywhere in the shaded zone, are 'efficient'. On the face of it this looks an objective judgement, but this is not the case. As mere observers we cannot comment on the efficiency of such movements – only Crusoe can! Only Crusoe can say whether he prefers more to less, and until we have his preference function the production 'possibilities' shown in figure 2.1 are just that; they signal nothing whatsoever about efficiency. For example, if figure 2.1 relates only to what Crusoe could produce, regardless of whether he likes the commodities, producing more fish at no extra cost in terms of forgone fruit (e.g. from *A* to *B*) cannot be efficient if the very smell of fish makes Crusoe nauseous. In other words, without any knowledge of preferences, as mere observers, we are unable to tell whether or not one of the commodities (or both commodities) is a pollutant, an undesirable thing and, therefore, whether or not it would be 'efficient' to produce less of it rather than more.

Let us assume, then, that Crusoe does like both fish and fruit and does want to produce both these items for his own consumption. Can we not, then, discuss Crusoe's 'technological efficiency', that which relates to quantifiable outputs only, with subjective valuations not being a hindrance? Unfortunately this does not resolve the difficulty, because one of the inputs, indeed the most important one, is Crusoe himself (his skills, energy and effort). Suppose, for example, that Crusoe is a poor swimmer and is squeamish about killing fish. It might well be the case in these circumstances that he quite enjoys collecting fruit but hates catching fish; and it is not enough to say that these relative preferences for different productive activities will be reflected in Crusoe's relative productivities (e.g. a relatively flat curve in figure 2.1) for they may

not be – Crusoe may possess very powerful self-control and be able to steel himself to become a very productive fisherman. The problem lies in the fact that Crusoe's distaste for fishing must be reflected somehow in the valuation of the output of fish; so how can we define 'technological' efficiency as something which relates to objectively quantifiable output?

Much the same difficulties would emerge if Crusoe were to be employed by someone else, and we shall have to face up to this in later chapters. As long as workers have different preferences for different modes of production it will not be possible to measure the relative efficiencies of alternative production processes unless this is taken into account. Very often account *is* taken of such differences when workers receive higher financial compensation for less attractive production methods, but this must be accounted for, then, in discussing the 'efficiency' of production methods. The way forward would seem to lie in letting our diagrams represent 'efficiency possibilities' as defined by the agent and not by the observer. In the case of self-sufficiency (or self-employment) this should present few difficulties. In the case of employer/employee relationships the likelihood of the employer defining 'efficiency', having regard for employees' preferences, will depend upon (a) his morality, (b) the likely effects of disregard upon employees' productivity, and (c) the bargaining strength of employees.

'Optimal' Resource Allocation

Given the qualifications and misgivings mentioned above, can we ever describe a whole economic system as being either 'efficient' or 'inefficient'? Suppose, for example, that we consider both goods markets and factor markets working together – can we define 'efficiency' as being achieved in both simultaneously? In other words, is there some concept of 'social efficiency' which can be applied to an economic system as a whole, some means of deciding which allocation of resources can be described as 'the best'? In some societies the problem is 'solved' through either the charisma, or the power, of the leader – allocation pattern *x* is best because Adolph says so! But in a democratic framework social 'rules' must be devised somehow. In particular, how can the economist offer any judgements about social welfare without reference to an accepted system of values? Much of the history of the foundation of theoretical welfare economics has been written in terms of a search for such a system and, in particular, for one which avoids value-judgements, and thereby bias. Of course the search is doomed from the outset – how is it possible to define an ethical rule which has no ethical content? The compromise has been to search for a rule which has a *minimum ethical content*, and at the present time economics still remains within that framework which, it is claimed, does have such a content – the Paretian ethical framework (after Vilfredo Pareto, 1848–1923) or what has become labelled as the 'new welfare economics'.

Despite being in the literature since around the turn of the century, the Paretian rule did not become entrenched until the late 1930s, or early 1940s. In fact its emergence followed the digestion by the economics profession of

Lionel Robbins's famous book *An Essay on the Nature and Significance of Economic Science* (1932), which did much to help destroy the last vestiges of utilitarianism inherited from the nineteenth century in the important works of A. C. Pigou at Cambridge.

Utilitarianism was based on the belief that the total welfare for society equals the sums of all the utilities (satisfaction) of the separate individuals within society, and that social welfare is improved when 'the greatest good is secured for the greatest number'. The problem with such a rule, of course, is that it necessitates a further value-judgement to be exercised when the greatest good for the greatest number can be achieved only at the expense of a minority; i.e. to judge a change in social welfare requires an interpersonal comparison to be made among the utilities of different members of society.

It was a distaste for such interpersonal comparisons which helped towards the emergence of the Paretian framework. The Paretian principle for comparing states of the world goes as follows: (i) weak form – social state A is better than state B if all individuals in the society prefer A to B; (ii) strong form – social state A is better than state B if one (or more) individual prefers A to B and the rest are indifferent between A and B. The strong form is the most often used by economists and it is usually worded – a *change* in the order of things is a Pareto improvement *if at least one person feels better off and none feels worse off*. The difference between this principle and utilitarianism should be clear. In terms of a simple society comprising two individuals, any change which increases the welfare of both is a Pareto improvement; any change which reduces the welfare of both is a Pareto regression; any change which increases the welfare of one but leaves the welfare of the other unchanged is a Pareto improvement, but any change which improves the welfare of one and harms the other *cannot be judged* within the confines of the Paretian framework since judgement involves an interpersonal comparison of utility. On the basis of the Paretian principle welfare economists have been able to make assessments about the desirability of alternative allocations of society's scarce resources on condition that the relative distributions of income are equally acceptable. Thus, returning to the production possibilities curve of our mythical island we can assume, now, two producer/traders, Crusoe and Friday, and define the conditions under which the curve is indeed some sort of efficiency locus. Figure 2.2 shows a box representing the constraints imposed on the island's economy by the available resources (say labour, L , and capital, K), technology, weather conditions, etc.

From the origin O^* is measured outputs of x (fish) while outputs of y (fruit) are measured from origin O^y ; corresponding isoquant sets are introduced into the box as $x_1 \dots n$ and $y_1 \dots n$. The Pareto criterion requires that the locus of the best output combinations comprises points from which it is not possible for the economy to move without suffering a loss in output of one (or both) of the commodities (with a consequent loss in revenue for the corresponding producer). This locus is usually termed the (production) contract curve and it passes through the points of tangency between the two sets of isoquants, i.e. efficiency is satisfied when marginal technical rates of substitution are equalized, when $MRTS_{LK}^x = MRTS_{LK}^y$. This can be appreciated intuitively

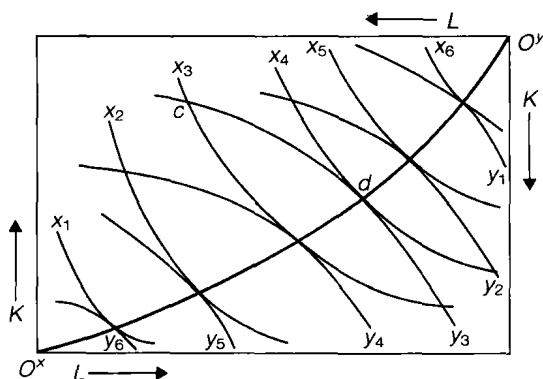


Figure 2.2

by seeing that for every point off the contract curve there is a superior point on it. For example, a reallocation of resources from point c to point d in figure 2.2 keeps output of y constant at y_3 but allows output of x to increase from x_3 to x_4 .

By mapping from the tangency points in figure 2.2 we can now erect again the production possibilities curve as shown in figure 2.3. All points along the PP' curve are Pareto efficient, relating as they do to points of equality between marginal technical rates of substitution in figure 2.2. The slope of the curve PP' measures the marginal rate of transformation of x into y (MRT_{xy}), i.e. it measures the ratio of the marginal costs of producing x and y , MC_y/MC_x .

Now, any point along the curve PP' in figure 2.3 represents a specific commodity output which can then be exchanged between Crusoe and Friday.

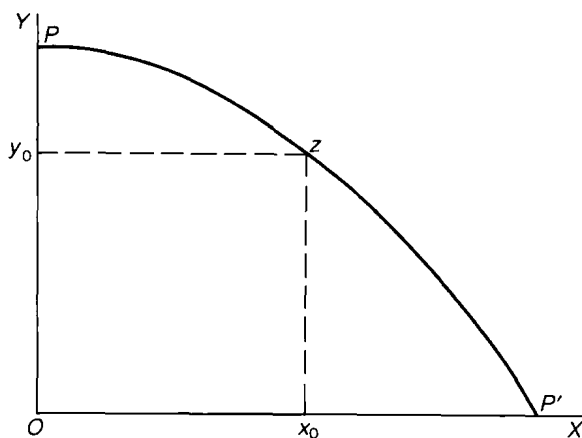


Figure 2.3

How is this output to be distributed in accordance with the Pareto criterion? Clearly, again, the best points (of consumption this time) will be those from which any movement must make at least one of the consumers worse off. Thus, again, we look to points of tangency – this time between indifference curves. In figure 2.4 the preference maps of both Crusoe and Friday ($a_1 \dots n$; $b_1 \dots n$) are introduced into the box formed by the constraints imposed by a given output of Oy_0 and Ox_0 .

In figure 2.4 the efficient consumption points lie along the (exchange) contract curve y_0x_0 where marginal rates of substitution are equalized ($MRS_{xy}^a = MRS_{xy}^b$). Again, for any point off this contract curve (e.g. e) there is at least one superior point on it (e.g. f) where more of one commodity is enjoyed without any loss of the other. Note that the shape of the contract curve in figure 2.4 is drawn as a wavy line, to remind us of the difficulties of defining subjective preference maps.

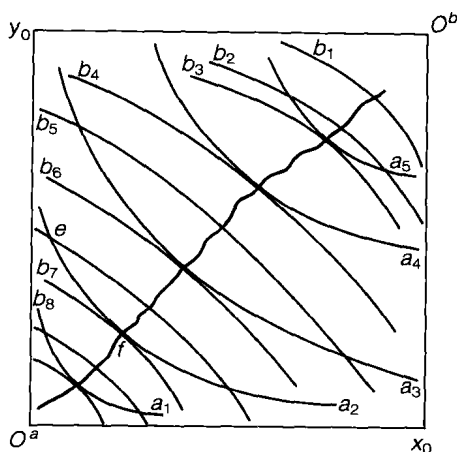


Figure 2.4

So, can we now devise some overall ruling, some 'grand optimum' condition from the Paretian framework? Such an optimum can indeed be defined as when the rate at which one good can be transformed into the other at the margin (MRT_{xy}) equals the consumers' marginal rate of substitution between the two goods ($MRS_{xy}^a = MRS_{xy}^b$). If, for example, the marginal social cost of 1x is 2y while consumers' preferences value 1x as 1y then the economy is producing too much x and too little y, according to consumers' preferences, and a Pareto improvement is possible.

Since Pareto optimality is about welfare (utility) maximization it is usual to map from 'output space' into 'utility space' to present a final view of the 'welfare frontier' or 'utility possibility frontier'. However, for present purposes there is nothing to gain from going so far; instead one can summarize, now, the conditions for a Pareto-optimal allocation of resources for a $2 \times 2 \times 2$ economy à la Crusoe (a) and Friday (b), where x and y are the goods produced by variable resources L and K.

- (i) efficient production: $MRTS_{LK}^x = MRTS_{LK}^y$
- (ii) efficient consumption: $MRS_{xy}^a = MRS_{xy}^b$
- (iii) efficient mix: $\frac{MC_y}{MC_x} = MRS_{xy}$ for both a and b .

Using the Paretian 'Yardstick'

The literature of welfare economics over the past three decades and more has been replete with articles and books which analyse real-world phenomena from the standpoint of these Paretian 'welfare conditions'. There is nothing within the Paretian framework to favour either a competitive market system or a wholly centrally planned economic order. To satisfy the rules of Pareto optimality, all that is required is that the ratios of marginal costs be equated with price ratios in all areas of production, and that these same price ratios be equated with marginal rates of substitution in all areas of consumption. These conditions are satisfied under perfect competition, but equally so under the dictates of a perfectly informed central planner. However, welfare economists in the mixed enterprise systems of the real world have regarded perfect competition as their blueprint and advocated policies to 'correct' real-world resource allocations when the latter do not result from marginal cost pricing.

Because of the acceptance of perfect competition's yardstick, perceived divergences from Pareto optimality have been discussed in terms of 'market breakdown'. Such breakdown results usually from two sources: monopoly power and so-called 'externalities'. When monopoly persists in any market, prices no longer truly reflect marginal costs and a Paretian welfare loss is incurred. Externalities persist when some costs and benefits have not been 'internalized', i.e. are either uncompensated or unrewarded. When this happens supply quantities can fail to accord with optimal requirements defined in Paretian terms.

It is not the intention at this stage to enter into a discussion of internalization processes and the debate over what should be the appropriate role of the state in the economic order. Such matters are left for chapter 17. It should be pointed out here, however, that our analysis does not set out to adhere, at all costs, to a view of the world as one populated by neutral economic agents engaged in a mathematical game in which outcomes are always predetermined. Rather, we prefer to believe that the nature of organizations and of 'social arrangements' makes adoption of welfare constructs like Pareto optimality a fruitless exercise in many respects. To continue with a view expressed earlier, and to echo Buchanan again, we are persuaded by the argument that the concept of a perfectly competitive general equilibrium squeezes out all the social content from individual behaviour in the market place. Furthermore, to model competition as a tool of 'social engineering', a device which stands as an alternative to centralized (governmental) resource allocation, is to misrepresent the true nature of the market process, which is about a network of relationships *evolving* from a process of trading, this evolution being reflected in markets *becoming* competitive (Buchanan, 1979).