1

MARKETS AND GOVERNMENTS

The most important question in the study of economics is:

When should a society forgo the economic freedom of markets and rely on the public finance and public policy of government?

This is a *normative question*. A normative question asks what ideally *should* be done or what ideally *should* happen. Normative questions are distinct from *positive questions*, the answers to which are predictions and explanations. The primary positive question that we shall ask is:

> *What do we predict will be the outcome when voters and taxpayers delegate responsibilities to governments through public finance and public policy?*

These normative and positive questions, asked in different circumstances, are the focus of this book. We shall take care to distinguish between normative and positive questions. A clear distinction is required because we do not wish to confuse what governments ideally ought to do with what governments actually do. The two can coincide but need not.

We shall not study any one particular government – federal or central, state or provincial, or local. Descriptions of a particular government's budget and public policies become outdated when the government and the policies change. Today's government budget is not necessarily tomorrow's, nor are today's public policies necessarily the policies that will be appropriate or in place in the future. Studying the details of a particular government's budget and public policies, therefore, does not provide useful, long-lasting knowledge. Lasting knowledge requires identification of general principles that remain applicable anywhere at any time. We shall seek to identify such general principles. Our quest is for general principles that apply to societies and governments in high-income democracies; however, occasionally comparisons will be made with other types of societies and governments.

Whether through outcomes in markets or the decisions of government, we shall seek the two objectives of efficiency and social justice. These are *social objectives*. A social objective is an objective that in principle is expected to be sought by consensus. Efficiency as a first approximation requires maximizing the total income of a society. Social justice is multifaceted and involves redistribution of income, equality of opportunity, and protection of rights to life and property.

There are three social objectives sought through public finance and public policy. After efficiency and social justice, the third social objective is macroeconomic stability, expressed in avoiding inflation and unemployment and maintaining stability of the banking and financial system. We shall not study macroeconomics.

Our scope will extend beyond the narrow definition of economics as choice when resources are limited. We shall encounter *political economy*, which is the interface between economics and politics and studies the economic consequences of political decisions. We shall draw extensively on concepts of the school of *public choice*, which is the source of political economy in the modern economics literature; a characteristic of the public-choice approach to economic analysis is that

all individuals, whether making decisions outside of or within government, are viewed as seeking their self-interest. We shall study outcomes of collective decisions made by voting. We shall also encounter the influence of ideology on social objectives; an ideology may give preeminence either to efficiency or social justice. The emotions and feelings that underlie views on fairness and social justice will take us to the intersection between economics and psychology known as *behavioral economics*. We also encounter *moral philosophy* and *ethics* – which is where we now begin.

1.1 The Prima Facie Case for the Market

If the social objectives of efficiency and social justice cannot be achieved through markets, governments can be asked to use public finance and public policy to attempt to improve on market outcomes. Before we consider responsibilities for governments, however, we look at outcomes of markets alone. Market outcomes provide the benchmark on which we ask governments to improve.

A. Self-interest with virtue

In markets, buyers and sellers pursue personal self-interest. Buyers maximize utility (or personal benefit) and sellers maximize profits. The decisions of buyers and sellers in markets are personal (rather than collective) and voluntary (rather than coerced). Individuals cannot lose from a personal voluntary market decision; people who perceive that they will not benefit simply can decide not to buy or sell. Buyers and sellers both gain from their personal voluntary decisions: Does the mutual benefit to buyers and sellers then imply that personal decisions in markets achieve the two social objectives of efficiency and social justice?

Adam Smith (1723–90), who is regarded as the founder of modern economics, proposed that when people seek personal benefit in markets, the ensuing market outcomes benefit society at large. Adam Smith first studied at Glasgow University in Scotland and then at Oxford University in England. After leaving Oxford (he did not receive a degree because he had been found to have read the then-banned author, David Hume), he returned to Glasgow University, where he was first a professor of logic and then subsequently a professor of moral philosophy.

It is significant that Adam Smith was a professor of moral philosophy. Moral philosophy studies ethical behavior. In his writings, Adam Smith referred to an *invisible hand* that is the source of social benefit in markets. The invisible hand transforms the quest for private benefit in markets into social benefit.[1]

[1] The "invisible hand" appeared in the books *The Theory of Moral Sentiments* published in 1759 and *An Enquiry into the Causes of the Wealth of Nations* first published in 1776.

People do not intend that their personal market decisions result in social benefit. The social benefit is unintentional: people intend only to benefit themselves. Nonetheless, the invisible hand ensures that personally decided self-interested outcomes are for the good of society.

The invisible hand thereby reconciles self-interest and virtue. People need not have guilt feelings about pursuing their own self-interest in markets and not altruistically caring about consequences of their market decisions for others.

The invisible hand also eliminates hypocrisy from market behavior. There is no reason for people to claim that they are seeking social benefit by doing favors in markets. Adam Smith observed, "I have never known much good done by those who affected to trade for the public good" (1776/1937, p. 423).[2]

B. Efficiency and competitive markets

Adam Smith viewed the invisible hand as maximizing total income for a society. Maximized total income is associated with the social objective of efficiency. The invisible hand is, of course, a metaphor. In the time that has passed since Adam Smith's writings, the need for the metaphor has been surpassed and formal proofs have confirmed that markets – in particular, competitive markets – achieve efficiency. The formal proofs differ in complexity and scope. The simplest proof, with which we now proceed, considers a single competitive market.

Social benefit and efficiency

We first define *social benefit*. With B indicating total benefit and C indicating total cost, social benefit is:

$$W = (B - C). \tag{1.1}$$

The benefit W is social because the personal benefits and costs of everyone in society are included in evaluating B and C. Next we define efficiency.

An outcome is efficient when social benefit $W = (B - C)$ is maximized.

Achieving efficiency thus requires that marginal benefit be equal to marginal cost:[3]

$$MB = MC. \tag{1.2}$$

Efficiency does not depend on who in a population benefits and incurs costs. Questions about the distribution of benefits and costs among people involve

[2] The saying "do not look a gift horse in the mouth" suggests that we should not examine too closely the quality of a gift (the teeth reveal the age and health of the horse). The invisible hand suggests, however, that we should be wary of favors offered in markets.

[3] Expression (1.2) is the first-order condition for maximum W. The second-order condition for a maximum requires that:

$$\frac{\partial MB}{\partial Q} < \frac{\partial MC}{\partial Q}.$$

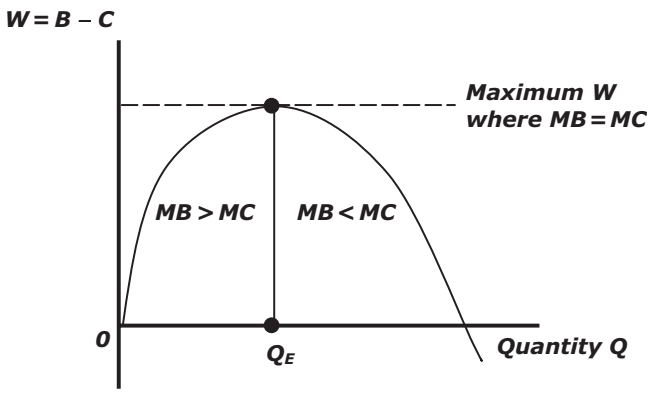

Figure 1.1. The efficient quantity that maximizes $W = (B - C)$ is Q_E.

social justice. Efficiency requires only the largest possible social benefit, independently of how benefits and costs are distributed among a population.

The definitions of *social benefit* and *efficiency* in general apply to any source of benefit or cost. We are in particular interested in benefits and costs associated with markets. When W refers to social benefit provided through a market, B is the total benefit of all buyers in the market and C is the total cost of all sellers.

Figure 1.1 shows social benefit W as depending on the total quantity of output Q supplied in a market. The efficient quantity that maximizes W is Q_E, determined in accord with expression (1.2) where $MB = MC$.[4]

Proof of the efficiency of a competitive market

In a competitive market, individual buyers and sellers do not influence price and are free to enter and leave the market. A proof of the efficiency of a competitive market has three components. The proof requires showing that:

(1) The market assigns goods among different buyers to achieve maximized total benefit, which we denote as B^{max}.
(2) The market assigns supply among different sellers to achieve minimized total costs, which we denote as C^{min}.
(3) With B^{max} and C^{min} achieved, the market also chooses a quantity such as Q_E in figure 1.1 that maximizes $W = B^{max} - C^{min}$.

We begin with buyers.

Buyers

Competitive markets have many buyers. Figure 1.2a shows two representative buyers with personal marginal benefits MB_1 and MB_2 from consumption. The

[4] In figure 1.1, the second-order condition also is satisfied at output Q_E. When $Q = 0$, also $W = 0$. When Q is sufficiently great, $W = B - C$ becomes negative because total costs exceed total benefits.

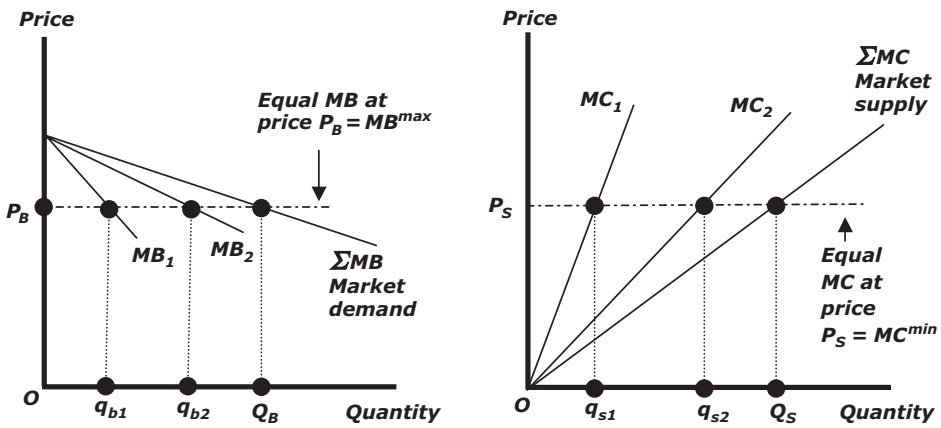

Figure 1.2. (a) B^{max} achieved through self-interested buyers' decisions. (b) C^{min} achieved through self-interested sellers' decisions.

MB functions indicate individual demands, expressed as marginal willingness to pay for additional output. Marginal willingness to pay is an amount of money. *MB* is therefore measured in terms of money – which can therefore be compared with marginal cost *MC*, which is also measured in terms of money.[5]

We now regard benefit from consumption as exclusively private or personal for each buyer. Only the buyer benefits and no one else. We shall presently define public goods from which a number of people can benefit simultaneously. In figure 1.2a, MB_1 and MB_2 decline with the quantity consumed, thereby indicating diminishing marginal benefit (or utility) from consumption.[6]

Total benefit of buyers is

$$B = B_1 + B_2, \tag{1.3}$$

which is maximized when

$$MB_1 = MB_2. \tag{1.4}$$

Expression (1.4) is a technical requirement (the first-order condition) for attaining maximal total benefit B^{max}. To prove that the market outcome for buyers is efficient, we need to show that self-interested market behavior of buyers replicates the technical requirement (1.4).

In figure 1.2a, total market demand at the price P_B confronting buyers is $Q_B = (q_{b1} + q_{b2})$. The personal quantities, q_{b1} and q_{b2}, are determined by buyers maximizing utility according to:

$$P_B = MB_1, \quad P_B = MB_2. \tag{1.5}$$

[5] Marginal utility is not measured in money but rather in terms of utility. Utility is ordinal and expresses rankings of outcomes according to preferences. Marginal willingness to pay expressed in *MB* is cardinally measurable in money terms. We shall refer to utility in some circumstances; for example, we describe people as making decisions to maximize utility. In general, we shall use the terms benefit and utility interchangeably.

[6] Linearity of marginal benefit is only for exposition.

It follows from expression (1.5) that self-interested utility-maximizing behavior of buyers results in:

$$MB_1 = P_B = MB_2. \tag{1.6}$$

The competitive market outcome (1.6) thus replicates the condition for efficiency (1.4). Therefore:

> *A competitive market efficiently assigns goods among buyers to maximize buyers' total benefit.*

The "assignment" of goods among buyers in a competitive market is self-assignment through personal choice. In figure 1.2a, buyers voluntarily choose the personal quantities q_{b1} and q_{b2} that maximize buyers' total benefit.

Sellers

A proof similar to that of the case of buyers shows that self-interested profit-maximizing behavior of sellers minimizes total cost of market supply. In figure 1.2b, MC_1 and MC_2 are marginal costs of two among many competitive sellers. The total cost of supply of the two sellers is

$$C = C_1 + C_2, \tag{1.7}$$

which is minimized when

$$MC_1 = MC_2. \tag{1.8}$$

Expression (1.8) is the technical requirement for achieving minimum total cost C^{min}. We now look at self-interested market behavior of sellers. In figure 1.2b, total market supply offered at price P_S confronting sellers is $Q_S = (q_{s1} + q_{s2})$. Individual sellers' profits are maximized when the sellers supply the quantities q_{s1} and q_{s2}, determined by

$$P_S = MC_1, \quad P_S = MC_2. \tag{1.9}$$

Therefore, self-interested market behavior of sellers results in:

$$MC_1 = P_S = MC_2. \tag{1.10}$$

The technical requirement (the first-order condition) for achieving minimized total cost of supply C^{min} as given by expression (1.8) is equivalent to expression (1.10), which is the consequence of self-interested market behavior of sellers. Therefore:

> *A competitive market efficiently assigns supply of goods among sellers to achieve minimized total cost.*

The assignment of supply to individual sellers is again through voluntary market decisions. That is, the assignment of supply is *self-assignment* through decisions freely made in response to the market selling price.

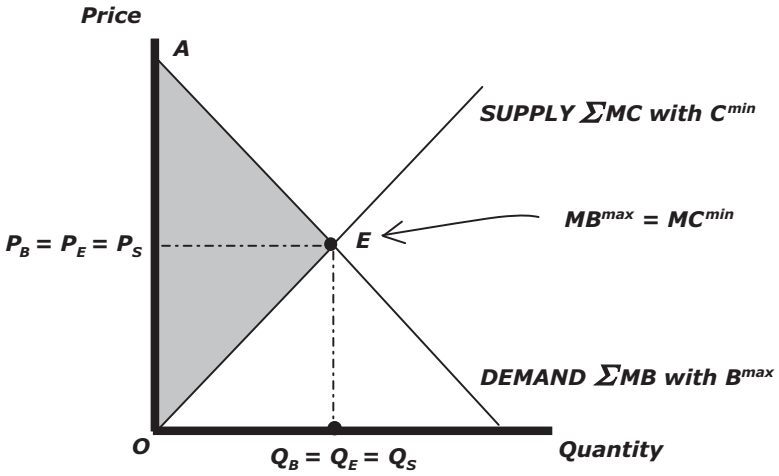

Figure 1.3. The maximum value of $W = B^{max} - C^{min}$ is indicated by the shaded area *AEO*.

The market equilibrium

The third and final condition for efficiency of market outcomes is satisfied if a competitive market maximizes:

$$W = B^{max} - C^{min}. \tag{1.11}$$

The technical requirement is:

$$MB^{max} = MC^{min}. \tag{1.12}$$

In the market shown in figure 1.3, the technical requirement (1.12) is satisfied at point E. We now need to show that self-interested market decisions replicate the technical requirement for efficiency (1.12).

The initial two steps of our proof of the efficiency of a competitive market indicated that, respectively, total benefit from consumption is maximized for any total quantity of output Q_B on a market demand function, while total cost of supply is minimized for any quantity of output Q_S on a market supply function. We therefore associate quantities on a market demand function with maximized total benefit to buyers B^{max} and quantities on a market supply function with minimized total cost of suppliers C^{min}. Correspondingly, as in figure 1.3, the market demand function indicates marginal benefit MB^{max} from additional consumption and the market supply function indicates marginal cost MC^{min} of additional supply.

Returning to figure 1.2a, we see that for buyers:

$$P_B = MB_1 = MB_2 \equiv \{MB^{max}\}. \tag{1.13}$$

Similarly, figure 1.2b shows that for sellers:

$$P_S = MC_1 = MC_2 \equiv \{MC^{min}\}. \tag{1.14}$$

In figure 1.3, the output supplied at point E is Q_E and the price is P_E, where:

$$Q_B = Q_E = Q_S, \quad P_B = P_E = P_S. \tag{1.15}$$

Combining expressions (1.13), (1.14), and (1.15) shows that, at point E:

$$MB^{max} = P_E = MC^{min}. \tag{1.16}$$

The outcome of self-interested behavior of buyers and sellers as described by expression (1.16) thus replicates the technical requirement (1.12) for maximized W.

At any quantity in figure 1.3, the area under the demand function measures maximized total benefit B^{max}. The area under the supply function measures minimized total cost C^{min}. The difference between the areas under the demand and supply functions is therefore $W = (B^{max} - C^{min})$, which we have indicated is maximized at point E. The maximized value of W is shown in figure 1.3 by the shaded area AEO.[7]

The competitive market-adjustment mechanism

Although we have shown that the market outcome at point E in figure 1.3 is efficient, the question remains:

How do we know that a competitive market will be at the efficient point E?

A competitive market-adjustment mechanism ensures that the market will be at point E. The point E is indeed the *equilibrium* of a competitive market.

At the quantity $Q_1 < Q_E$ in figure 1.4:

$$P_S = MC < P_B. \tag{1.17}$$

Sellers thus know that buyers' willingness to pay for additional output, given by P_B, exceeds the MC of supply. Sellers therefore increase supply beyond Q_1. At the efficient quantity Q_E at point E, buyers' willingness to pay P_B is precisely equal to suppliers' MC. Suppliers therefore no longer have an incentive to expand output.[8]

Alternatively, at a quantity such as $Q_2 > Q_E$:

$$P_S = MC > P_B. \tag{1.18}$$

[7] The shaded area above the price P_E is known as consumer surplus. The shaded area below the price P_E is known as producer surplus. In using MB to represent demand and using the area under the demand function to represent total benefit B, we rely on the substitution effect of relative price changes. There is also an income effect. For any one good, the income effect is, in general, small and the substitution effect is therefore the basis for a good approximation to total benefit (see Willig, 1976). Income effects will be introduced and explained where income effects have consequences that we wish to emphasize. When income effects are introduced, all goods will be regarded as normal goods (for which demand increases when income increases).

[8] In general, after we proceed beyond the proof of the efficiency of competitive markets, we shall use MB and MC without adding the respective superscripts *max* and *min*. We then take for granted that MB refers to the equal marginal benefit of buyers that has maximized total benefit B and that MC indicates the equal marginal cost of suppliers that has minimized total cost C.