Economics of state-owned enterprises

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Abstract

State-owned enterprises (SOEs) account for a substantial proportion of GDP, employment and assets in many countries. This article reviews the theory relating to SOEs: their economic rationale, the circumstances in which SOEs are the preferred form of government intervention, and their efficiency and welfare consequences. Based on the theory and empirical evidence, we develop a novel five-step framework that can guide policymakers and economic advisors in making decisions about maintaining and/or creating SOEs. The framework suggests that the use of SOEs should be limited to circumstances in which a market failure exists, less invasive forms of intervention such as regulation/taxes/subsidies and private sector contracting are ineffective or not possible, and the welfare loss of the market failure exceeds the costs, distortions and inefficiencies of SOEs.

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1. Introduction

State-owned enterprises (SOEs) account for a substantial proportion of GDP, employment and assets in many countries. In OECD countries alone SOEs employ more than six million people and have a value of close to US$ 1.9 trillion (Christiansen, 2011). Their prevalence and the way in which they are used are continually changing in different parts of the world. For example, many developed and transition countries have privatized a substantial number of SOEs during the past three decades, driven in part by globalization (Farazmand, 1999a, 2002) and a general trend towards increasingly market-based economies (Wettenhall, 2001; Thynne, 2011; Farazmand, 2012). At the same time, in a shift away from the traditional public sector, many countries have made increasing use of SOEs in place of more traditional public sector organizational structures (Wettenhall, 2001). Some countries have pursued alternative policies such as corporatization of SOEs in place of privatization (e.g., China, see Aivazian et al., 2005; Jefferson and Su, 2006; Girma and Gong, 2008). Since the 2008/2009 economic crisis, many governments have "rediscovered" SOEs as useful instruments for dealing with specific policy objectives, creating a new generation of SOEs and partly reversing the privatization trend (Florio and Fecher, 2011; Thynne, 2011; Florio, 2013; Bernier, 2014; Florio, 2014). SOEs remain particularly prevalent in emerging economies, a phenomenon that is referred to as "state capitalism" by a recent special report dedicated to the issue in *The Economist*.[1] The special report points out that SOEs are undergoing a revival, with many countries making new investments in SOEs. SOEs continue to play an important role in major industries (the world's ten biggest oil-and-gas firms, measured by reserves, are all state-owned) and major markets (state-backed companies account for 80% of the value of China's stock market and 62% of Russia's).

SOEs constitute a 'third sector' in an economy, standing between private enterprise and traditional government administration and regulation functions. State-owned enterprises are hybrids that combine public and private sector characteristics (Thynne, 1994). Florio (2014) highlights that despite the fact that SOEs still play a significant role in many countries, economists and policy makers no longer seem to have a firm understanding of why SOEs exist, and that this "vacuum in economic theory and policy" reflects a "mismatch between doctrines and reality". This article aims to reduce the mismatch and contribute to filling the void.

The specific questions addressed in this article are: (i) how, and under what circumstances should governments use SOEs; and (ii) what are the effects of SOEs on private

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sector companies, markets and social welfare? These questions are of fundamental importance to policymakers deciding on when and how SOEs should be utilized. This article synthesizes the aggregate findings of an extensive body of economic theory and empirical studies on the two questions above. Based on the findings of previous studies, this article develops a novel and practical five-step framework that can be used by policymakers and economic advisors to evaluate the desirability of maintaining existing SOEs and/or creating new SOEs. This framework is based on the objective of maximizing social welfare. It involves identifying a market failure, establishing the most desirable form of intervention, and evaluating whether the benefits of the intervention outweigh the costs and undesirable side effects. Therefore, this article serves two purposes: (i) to draw together theory and empirical evidence relevant to understanding the economics of SOEs; and (ii) to bridge the divide between academic studies and practice by translating the findings of a large body of academic work into a practical framework for assessing SOEs, their effects and alternatives.

This article does not, however, attempt to provide an exhaustive review of all of the literature related to SOEs. Instead, this article covers the broad questions that are necessary for informed policymaking concerning SOEs, drawing insights from a wide range of fields including microeconomics, public economics, welfare economics, organizational theory and agency theory. Complimentary reading includes excellent reviews of: public sector economics (Stiglitz, 1988); performance of SOEs compared to private enterprises (Boardman and Vining, 1989; Vining and Boardman, 1992); the earlier literature on SOEs, focusing on different theoretical approaches to modeling them (Lawson, 1994); the objectives, methods and outcomes of privatization (Farazmand, 1999b; OECD, 2003; Megginson and Netter, 2001; Ubillos, 2005); corporate governance practices of SOEs (OECD, 2005); and the prevalence and characteristics of SOEs in OECD countries (Christiansen, 2011).

The body of this article is structured in three parts. The first part provides a background on the rationale and roles for SOEs. It begins with a review of a free market without government intervention, which serves as a benchmark against which to judge government intervention such as the use of SOEs. This is followed by a discussion of market failures, or circumstances in which a free market does not maximize social welfare. Market failures provide rationale for government interventions, including SOEs. We argue that when an SOE's objectives are not stated in terms of market failures, in most cases it is possible to reframe the government's purpose for operating the SOE in terms of market failures. We

provide some examples. The section also discusses the circumstances in which SOEs are the preferred form of government intervention and describes possible alternatives.

The second part of this article reviews the consequences of operating SOEs, in particular how various inefficiencies and shortcomings affect the private sector and social welfare. The review has implications for how the performance of SOEs can be improved. The last section of this article summarizes the conclusions on the roles and consequences of SOEs. We present a five-step framework for evaluating when the use of an SOE is desirable, under the objective of maximizing social welfare. This framework is not a simple formula because each step involves considerable analysis of costs/benefits. However, the framework provides the series of questions that must be considered to arrive at economically sound, informed policy concerning the use of SOEs.

2. The rationale and roles for state-owned enterprises

2.1 Approach to evaluating policy alternatives

Our approach to evaluating the circumstances in which it is desirable for a government to operate an SOE assumes the objective of government is maximizing social welfare. Social welfare is difficult to define precisely and therefore all measures involve some value judgment. Following a long line of economics literature, we minimize the need to make value judgments by relying on analysis of Pareto efficiency.[2] An action that increases social welfare but makes some people worse off can be made into a Pareto improvement by using some of the gains to compensate those that would have been worse off.[3] Therefore, evaluating policy alternatives in terms of aggregate social welfare is equivalent to searching for Pareto improvements, assuming the government has a mechanism to redistribute benefits.

It is worth noting some alternative approaches to evaluating the role of the state, including those grounded in normative theory. For example, socialist economic theories are grounded in the normative belief that the economic system should promote equality and

[2] An economy is Pareto efficient if it is not possible to make at least one person better off without making someone else worse off. A change that make makes at least one person better off without making anyone worse off (a Pareto improvement) unambiguously increases social welfare, whereas a change that makes some people better off but at least one other person worse off is not a Pareto improvement.

[3] Strictly speaking, with the assumption of a mechanism for redistribution, our analysis makes use of Kaldor-Hicks efficiency, which is closely related to Pareto efficiency, but somewhat less stringent. Under Kaldor-Hicks efficiency, an outcome is considered more efficient if a Pareto efficient outcome can be reached by arranging sufficient compensation from those that are made better off to those that are made worse off so that no one ends up worse off.

liberty. Socialist theories argue that achieving equality requires some form of social ownership (such as state ownership) of the means of production to avoid exploitation of labor and the emergence of a ruling class. It is argued that social ownership gives individuals freedom from having to perform labor for a ruling class to receive access to the material necessities for life, and thus promotes maximization of individual liberty.

A less extreme incarnation of socialist ideology (combined with other influences) can be found in modern 'welfare states' in which government plays a key role in promoting economic and social well-being of citizens. Modern welfare states are underpinned by normative values such as equality of opportunity, equity in wealth distribution, and all citizens having a right to certain basic goods/services. As a result of its underpinning values, modern welfare states usually involve redistributive taxation, support for citizens unable to earn sufficient income, and state provision of services such as healthcare and education, which is where SOEs may be utilized.

The Keynesian economic school of thought takes the view that free market economies are unable to maintain full employment. Economic output and thus employment are determined by aggregate demand (rather than factors such as laziness), which sometimes behaves erratically and causes recessions and periods of underutilization of resources. Keynesians argue that the government should intervene to promote full employment and macroeconomic stability through actions including government spending. In the context of SOEs, changes in government spending could be facilitated by expansion/contraction of investment in SOEs. Although a lot of Keynesian economic theory is built on formal models and analysis, it too has a normative component and considers values such as equity. For example, Keynes (1936) writes, "the outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and incomes".

Although the various alternatives such as socialist and Keynesian views of the role of government may at first appear quite different to the relatively judgment-free Pareto optimality criteria, we argue that it is possible to reconcile the main features of these alternative approaches in the framework of market failures. Specifically, the motivations for government intervention in markets (including ownership of SOEs) under socialist or Keynesian views can be recast as specific forms of the broad categories of market failures. We provide a discussion and several examples in Section 2.6. For example, universal access to healthcare, education and basic needs such as shelter and food – important rights from a socialist or welfare state

perspective – are in fact goods/services that have positive externalities as well as means of creating the public good of social cohesion and wellbeing. Macroeconomic stability and full employment – important objectives of Keynesian economics – can be viewed as public goods. Macroeconomic stability improves firms' ability to plan and reduces risk and uncertainty, and full employment can lead to more social cohesion and wellbeing due to less income inequality, less crime and better health. Therefore, in what follows we use the relatively judgment free Pareto efficiency criteria to compare alternatives and a characterization of market failures as a broad and overarching framework to consider the various reasons for government intervention, including the use of SOEs.

2.2 The free competitive market as a benchmark

As a starting point for analyzing potential roles for government consider a perfectly competitive free market, i.e., one without government intervention other than protection of property rights. The first fundamental theorem of welfare economics (arising from the work of Kenneth Arrow, Gerard Debreu and others), states that free markets, under certain conditions, produce Pareto optimal allocation of resources (see, e.g., Stiglitz, 1991). The intuition for this theorem is elegantly described by Adam Smith who argues that competition amongst self-interested individuals unintentionally, via an *invisible hand*, often promotes the best interests of society; frequently even better than had the individuals set out to pursue society's interests. Trade occurs when it is beneficial to both the seller and the buyer so a market in which trade is unrestricted will arrive at Pareto efficiency by conducting all of the welfare increasing transactions and none of the transactions that would decrease welfare. If there is demand from consumers for a certain product or service that is not currently produced then they will be willing to pay something for it. Entrepreneurs are constantly seeking profit opportunities and therefore if they can produce the product at a cost less than what the consumers are willing to pay for it they will do so. Similarly, if there is a cheaper way to produce something that is currently being produced, competing entrepreneurs will do so to gain profits. Therefore, the self-interested pursuit of profits often leads an economy to find the most efficient ways of producing things and to innovate such that new products or services better serve the needs of consumers.

An important result of the competitive market in a Pareto efficient equilibrium, one which will help identify situations in which government intervention could be beneficial, is that the marginal social benefit of each good or service is equal to the marginal social cost of

that good or service. The marginal social benefit/cost is the additional benefit/cost to society as a whole from producing one more unit of the good or service, i.e., the sum of the benefits/costs of individual members of society. If the marginal social benefit is greater or less than the marginal social cost of a good then the economy is not efficient because it is possible to increase social welfare by producing one more or one less unit of the good, respectively.[4]

Another important result of the competitive market in a Pareto efficient equilibrium is that the marginal social benefit and the marginal social cost both equal the price of the good or service and producers earn only fair compensation (profits equal to what could be earned by producing other goods).[5]

Finally, in equilibrium goods are produced at the lowest possible cost. If there were lower cost means of production then entrepreneurs would exploit them to capture excess profits and keep exploiting them until no more excess profits could be earned (at which point price again equals marginal cost).

If competitive markets left to their own devices allocate resources efficiently and utilize the lowest cost means of production the role for a government with the objective of welfare maximization is minimal – enforcing property rights and possibly redistributing income. However, free markets only achieve the Pareto optimal outcomes described above if a certain set of conditions (implicit in the examples) are satisfied. Three important conditions are: (i) strong competition among entrepreneurs; (ii) social costs/benefits of production/consumption equal private costs/benefits, i.e., there are no costs/benefits to members of society other than those of the consumer and producer; and (ii) the consumption of

[4] For example, suppose a country has 40 schools and 60 hospitals and that running the 40th school and the 60th hospital requires the same amount of resources (they have the same marginal social cost). If society values having another school more than they value having the 60th hospital then the economy is not producing an efficient mix of goods because by closing down the 60th hospital and using the freed up resources to run an additional school makes society better off in aggregate. This change in the mix of goods produced, under some conditions, occurs naturally in a competitive market: if the higher value to society of the 41st school relative to the 60th hospital would be reflected in a higher willingness to pay for the services of the 41st school then some entrepreneurs would be induced to switch their production to reap the higher profits.

[5] For example, consider an economy that produces 1000 units of a good. Suppose that the total social cost of producing an additional unit (the 1001st) is the cost to an entrepreneur of $5 (includes production costs and fair profit for the entrepreneur). Suppose that the social benefit of an additional unit, the highest price anyone in the economy is willing to pay for the additional unit is $10. The 1001st unit would be produced because it is profitable to do so (it would earn profits in excess of fair compensation) and society would gain welfare equivalent to $5 – the amount by which marginal social benefit exceeds the marginal social cost. In fact, competing, profit-seeking entrepreneurs would keep producing more units up until the price that could be received would only just cover the costs of producing them (including a fair profit for the entrepreneur). At this point the marginal social benefit (the best price that could be obtained for an additional unit) equals the marginal social cost (the production costs for the entrepreneur that produces the marginal unit), which equals the price of the good.

a good by one person reduces the ability for others to consume the same unit of the good and it is possible to exclude people that have not paid for the good from consuming it. If either of these or any of the other conditions are not satisfied the free market may produce Pareto inefficient outcomes, i.e., situations in which it is possible to make at least one individual better off without making any other individual worse off. Such situations, known as 'market failures', provide rationale for government intervention in the market over and above the basic functions of enforcing property rights and redistributing income. Government intervention may be able to correct the market failure and, by bringing the market closer to Pareto optimality, increase social welfare. The following subsections will discuss three important market failures.

2.3 First market failure: Lack of competition and natural monopolies

Competition is one of the key elements that drive a market to achieve efficient resource allocation. In some industries goods or services are produced by a small number of firms. The extreme case of a monopoly one firm has the entire market share. A single or a small number of firms does not necessarily mean competition will be low because threat from possible entrants to the market can drive existing firms to act as if there were many competitors. However, competition will be low in markets with few firms if there are substantial barriers to entry that restrict new firms from entering the market. Barriers to entry can result from laws, e.g., copyrights, patents, licenses. They also occur naturally in industries with significant increasing returns to scale, i.e., when costs of production decline substantially with increased scale of production. In such industries, known as 'natural monopolies', as a company becomes larger its unit costs fall allowing it to undercut smaller firms and drive them out of the market. In such cases having a single producer is the lowest cost means of producing the demanded goods. Examples include public utilities such as water, electricity and gas, as well as postal services, railways and fixed line telephony.

There are two distinct reasons why unregulated monopolies fail to produce goods in a manner that maximizes social welfare. The first is that, regardless of the returns to scale, a profit-maximizing monopolist will exploit their market power to increase the price above that which would arise in a competitive market. This maximizes the monopolist's profits, but it also reduces the quantity produced. For example, instead of selling 200 units at a price of $2 per unit (suppose this is the Pareto optimal amount) the monopolist finds it more profitable to sell only 100 units because then it can obtain a price of $5 per unit. At the monopolist's profit

maximizing quantity and price (Q^M and P^M in Panel A of Figure 1) marginal social benefit is greater than marginal social cost, so the market is not Pareto efficient: social welfare could be increased by producing more of the good and charging a lower price (ideally producing Q* at a price of P* in Panel A of Figure 1).

< FIGURE 1 HERE >

Possible government interventions to reduce the welfare loss from a monopolist exploiting market power are: (i) regulating the market such that the price is kept at the welfare maximizing level; and (ii) owning the enterprise and operating it under a welfare maximization objective, which requires setting price at the Pareto efficient level rather than the profit maximizing level.

The second reason for suboptimal outcomes applies only to the case of natural monopolies, i.e., industries with increasing returns to scale. In such industries it is impossible to have price equal to marginal cost (a condition required for Pareto efficiency) and have the producer earn a positive profit. When marginal costs are decreasing, average costs per unit are greater than marginal costs at each possible quantity of production. Therefore, setting price at the point where marginal cost and marginal benefits are equal (to obtain Pareto efficiency) means that price received by the producer for each unit will be less than the average cost of producing a unit and the producer will make a loss (price P* and quantity Q* in Panel B of Figure 1).

The degree of competition in a market and the existence of a monopoly is not a constant; it changes over time. For example, technological developments have weakened some traditional natural monopolies, such as telecommunications and broadcasting, by making it easier for competing entrepreneurs to enter the industries.

Possible government interventions to correct the market failure in a natural monopoly include: (i) regulating the market such that the price is kept at the welfare maximizing level and then providing the producer a subsidy to compensate the losses it would otherwise make (if economies of scale are strong); and (ii) owning the enterprise and operating it under a welfare maximization objective, which would mean making up the revenue shortfall with general tax receipts. Regulation, in particular of price and quality, is a less intrusive means of addressing the inefficiency that arises in monopolies. When government ownership is the chosen intervention it is important to recognize that the welfare maximizing levels of price and

quantity are not the profit maximizing levels. Therefore, SOEs operating in monopolies should not have financial profit maximization as their primary objective, otherwise the economic inefficiency is at least as large (but likely larger, for reasons explained later) than leaving the market to its own devices.

2.4 Second market failure: Externalities

In the examples of a competitive market achieving welfare maximizing outcomes the marginal consumer was willing to pay an amount equal to his private benefit from consuming the good and a producer was willing to sell the good for an amount equal to his private costs of producing the good. Importantly, an individual's consumption and the production of the good were assumed to impose no benefits or costs on other members of society. Therefore, the marginal social benefit was equal to the marginal private benefit (the price the marginal consumer is willing to pay) and the marginal social cost was equal to the marginal private cost (the producer's selling price).

In general, this need not be the case due to unintended side-effects of consumption or production, i.e., externalities. Therefore,

marginal social benefit = marginal private benefit + externalities; and

marginal social cost = marginal private cost - externalities.

Externalities are positive if consumption or production unintentionally benefits other members of society and they are negative if consumption or production imposes unintended costs on other members of society. A steel producer upstream that pollutes a river and imposes higher water treatment costs on the brewer downstream is an example of a negative externality from production. Similarly a homeowner that plants a beautiful garden in front of his house creates positive externalities because his neighbors may enjoy looking at the garden. An additional car on a crowded road increases traffic congestion, slows down other drivers, increases the risk of an accident and adds to air pollution (negative externalities). A person that vaccinates against a disease is unlikely to catch the disease and spread it to other people (positive externality).

The problem caused by externalities is that in a free market consumers and producers only consider their private costs and benefits in making decisions and therefore marginal social benefit will not in general equal marginal social cost and consequently social welfare will not be maximized. As illustrated in Figure 2, goods with negative externalities will be over-produced relative to social welfare maximizing levels and goods with positive externalities will be under-produced.

< FIGURE 2 HERE >

There are several ways in which the government could increase social welfare by intervening in markets for goods with large externalities. A relatively simple intervention is taxing goods with negative externalities and subsidizing goods with positive externalities (a 'Pigovian tax'). The objective is for the tax or subsidy to impose additional private costs or benefits to the producer or consumer to bring private costs/benefits in line with social costs/benefits and restore Pareto efficiency. Examples include various forms of 'carbon taxes' to address the negative externalities that arise from using fossil fuels, and government-subsidized education to address the positive externalities such as reduced propensity for crime amongst educated people and increased production of research and knowledge, which benefits other members of society. The main difficulty in using taxes or subsidies to address this market failure is estimating the magnitude of the tax/subsidy that would correct the externality. Despite this difficulty, taxes and subsidies are viewed by many economists as the most efficient means of addressing this market failure in the majority of cases. A partial solution to the economic inefficiency caused by externalities can be achieved with regulation that prohibits or limits activities with negative externalities.

An alternative to taxes/subsidies is for the government to take control of production under a welfare maximization objective, which would mean setting price or quantity at the social welfare maximizing level. An example is state-owned hospitals – part of the rationale for state ownership is that an individual's good health has positive externalities in that they are less likely to spread disease to others. As was the case with monopolies, the welfare maximizing price is not the profit maximizing price and therefore SOEs that are intended to address inefficiencies that occur in a free market due to externalities cannot have financial profit maximization as their primary objective.

2.5 Third market failure: Public goods

Free markets fail to achieve Pareto efficiency when goods posses either of two particular characteristics. The first of these characteristics is 'non-rivalness' in consumption, meaning that consumption by an additional individual does not reduce the benefit of other consumers. A radio broadcast is non-rival because the benefit a person gets from listening to the broadcast is not affected if another person chooses to tune in their radio and also listen to the same broadcast, whereas a pair of trousers is rival in consumption because they can only be

worn by one person at a given time. Another way of thinking about the non-rivalness characteristic is whether use of the good or service depletes the supply available to others – if not then the good is non-rival.

To understand why a free competitive market fails to optimally produce non-rival goods recall the conditions required for Pareto efficiency: marginal social benefit equals marginal social cost and both equal price. The marginal social cost of a non-rival good is zero, e.g., it does not cost the radio program producers any more if a second person chooses to tune in to the program and it does not lessen the first listener's enjoyment from the program; yet the marginal social benefit can be positive, e.g., if the additional (marginal) consumer gains enjoyment from the radio program. Because the marginal social cost is zero, Pareto efficiency or social welfare maximization requires that the price of the non-rival good is zero (free) so that everyone that wants to consume it does so and therefore the marginal social benefit is also zero. So only if non-rival goods are provided free of charge can the market be Pareto efficient and rule out actions that would make some members of society better off without making anyone else worse off. The problem in free-market provision of non-rival goods lies in that private-sector entrepreneurs will generally not provide goods for free because it is unprofitable to do so. Therefore non-rival goods are typically under-produced (if at all) by a free market.

The second characteristic that causes market failure is 'non-excludability' of consumption, meaning that it is not possible or not desirable to exclude people from consuming the good. An example of the former type, termed 'technical non-excludability', is national security – once it is produced for one inhabitant of a territory it is not possible to exclude other inhabitants from enjoying the benefits. Technical non-excludability is rarely as clear-cut as it is for national security because it is often possible to exclude individuals, but at a considerable cost. For example, while it is possible to exclude people from enjoying public parks it is considerably costly to build long fences and implement entry control mechanisms and such actions may even detract from the enjoyableness of the parks. Similarly putting tolls on every road is costly and inconvenient. The latter type of non-excludability occurs, for example, with non-rival goods. Because the marginal social costs of consumption are zero it is not desirable from a social welfare maximization perspective to exclude anyone from consuming the good.

A free competitive market fails to optimally produce non-excludable goods due to free-riding (Olson, 1965). If individuals can consume the good without paying for it, many would choose not to pay for it on the hope that others will bear the costs of provision (the free-riding

strategy). If everyone attempts to free-ride the good will not be produced even when the potential benefits gained from the good exceed the costs of provision.

A *public good* is typically defined as having both characteristics – non-rivalness and non-excludability.[6] If one includes goods for which exclusion is not desirable in the definition of non-excludability then non-rivalness is a sufficient condition for a good to be classed as a public good (because non-excludability follows). A typical example is a lighthouse – once a lighthouse is operating an additional ship can gain guidance from it without reducing the benefits to other ships and it is not feasible to exclude ships from benefiting from the lighthouse. Although a public good is typically defined as having both the non-rivalness and non-excludability characteristics, either of these characteristics alone is a sufficient condition for market failure (Olson, 1986).

Classification as a public good is not an absolute; it depends on the state of technology and market conditions. For example, using the television broadcasting technology a decade ago it was not possible to exclude any owner of a television from viewing the broadcast, but today such exclusion is possible using signal scrambling.

The polar opposite of a public good is a *private good*: one which is rival and excludable. Many goods lie somewhere in between pure public goods and pure private goods; they are to some extent rival and to some extent excludable and often referred to as *mixed goods* (or *impure public goods* or *semi-public goods*).

Public goods and mixed goods can also be viewed as a form of positive externality: once one or several consumers arrange provision other individuals benefit from also being able to consume the good. Viewed in this manner, moving through the spectrum of goods from pure private goods to pure public goods (bottom left-hand region) positive externalities are increasing. As discussed earlier, a free market will produce goods with externalities, but in quantities that are not optimal. As the externalities get larger, the economic inefficiency gets larger.

Government provision of public goods, and even mixed goods, is one way of addressing the market failure and increasing social welfare relative to a free market. Consider non-rival goods, which, to maximize social welfare, should be provided for free (because marginal social cost is zero). The government could use general tax revenue to cover the fixed

[6] Goods that for whatever reasons are provided by the government are sometimes colloquially referred to as 'public goods'. This usage of the term is not consistent with the economic definition provided above and is not based on any rationale of when government provision of goods can increase social welfare.

costs of providing the good and because general taxes do not depend on the taxpayer's use of the good, the price of each use would be zero. Similarly, it is not practically possible or not desirable to charge individuals for non-excludable goods and therefore a social welfare increasing role of the government could be to provide such goods for free and cover the costs of provision from general tax revenue. As in the previous example of government provision to address market failures, profit maximization is not an objective that in this context is consistent with social welfare maximization. An alternative to government provision of public or mixed goods is contracted private provision, i.e., if the government can specify a quantity and quality standard for the desired good it can use general tax revenue to pay a private company to provide the good.

The main challenge in government provision of public goods (or private sector outsourcing) is identifying the efficient quantity to provide. In a free market the efficient quantity is determined via the price mechanism: consumers' willingness to pay reflects the value they gain from goods and producers' selling price reflects their costs of production. In the absence of the price mechanism it is difficult to know exactly how much value consumers place on the good, and even how much of the good is consumed (e.g., free television), and therefore it is difficult to determine the optimal production quantity.

2.6 Other market failures and other roles of the government

The three market failures described in the previous subsections are the most relevant to explain why the majority of SOEs came into existence and to provide a rationale, from a social welfare maximization perspective, for maintaining SOEs. There are, however, other market failures that less often motivate the existence of particular SOEs.[7] An example is information asymmetry – situations in which one party involved or potentially involved in a transaction is more informed than the other. Information asymmetry can constrain the ability for entrepreneurs to obtain private-sector financing for productive and profitable investment due to the difficulties for private-sector financiers to accurately assess the prospects of the investment without all the information known to the entrepreneur (Myers and Majluf, 1984). Such effects are sometimes used to justify government provision of financing to entrepreneurs and high-risk investments through venture capital funds and 'development finance' institutions. For goods

[7] Pesche (2008) argues that in addition to market failures, a second set of roles for the state emerges from political theory and including providing an institutional structure that allows people to identify themselves as part of a community. See also Pierre (2011) for a discussion of additional roles of the state including legality, due process, and legal security.

and services in which quality or a lack thereof can have serious consequences and information asymmetry makes it difficult or costly for consumers to make proper assessments of quality, e.g., medical practice, the government might intervene by providing the good or, preferably, by regulating the market with licenses and certification to ensure a minimum standard of quality (Leland, 1979).

In many countries SOEs are viewed as a tool to introduce industries or goods in which the country has no prior experience or in which it is not yet internationally competitive. Such intervention is a form of 'industrial policy', i.e., deliberate promotion of particular industries, and is usually a temporary measure intended to allow industries to develop to the point at which they become internationally competitive. A common justification for such intervention is that starting production is be prohibitively costly for the first entrant – e.g., need to train specialized labor, obtain suppliers of intermediate goods, and a high amount of uncertainty about whether the new industry is feasible – but once the industry is established it becomes feasible for private-sector firms to enter and compete in the new industry. The first entrant is said to create 'information spillovers' that are valuable to other potential entrants. Viewed this way, the first entrant creates positive externalities on other potential producers (e.g., Hausmann and Rodrik, 2003). As discussed above, the market failure of externalities can also be minimized with taxes/subsidies, which are often preferred to government provision.

In many countries, governments justify their control over certain enterprises on the basis that the enterprises serve a 'strategic' role. Such justification is vague and in most cases the underlying rationale is simply one or several of the key market failures discussed above (monopolies, externalities, and public goods) worded differently. In many instances the use of the term 'strategic' is synonymous with the public good of national security. For example, state ownership of 'strategic' energy production assets is often justified on the basis that if they come into foreign ownership they could be used to threaten or oppress the home country by, for example, discontinuing energy supply. Viewed in this way, an energy producer with an owner that acts in the national best interests could be considered to produce a combination of a private and a public good: energy and national security, respectively.

Governments, in particular modern welfare states and those more inclined to socialist ideologies, often take responsibility for income redistribution, guaranteeing a minimum level of basic services such as food, shelter, healthcare and education, and enforcement of particular rights and laws aimed at promoting equality in opportunities and equity in wealth. In some instances SOEs are used as a tool in fulfilling these roles. For example, many governments

operate hospitals (often in the form of SOEs) to guarantee a minimum level of healthcare, and industrial SOEs have been used to provide basic jobs to citizens that would otherwise face less favorable employment prospects.

The social stability, cohesion and general wellbeing that result from a degree of equality in wealth distribution and a guaranteed minimum level of basic goods and services for all members of society can be viewed as a public good – no individual can be excluded from enjoying the wellbeing of society and one individual's benefit from this good does not impede on others' ability to enjoy the good. Therefore, similar to enterprises that serve 'strategic' roles, enterprises that serve equity or equality objectives produce a combination of a private good and a public good. For example, a state-subsidized hospital that provides basic medical services at below market prices can be though of as producing the private good *medical treatment* and some amount of the public good *social equality and wellbeing*.

Keynesians (and monetarists) argue that government has an important role to play in stabilizing the economy and restoring full employment when aggregate demand is naturally insufficient. One way for a government to implement stabilizing fiscal policy is through SOEs, increasing investment and the activities of SOEs during economic downturns and reducing their activities during periods of strong natural growth. Even without necessarily changing net investment, SOEs may still provide a stabilizing force if, in filling the social objective of maintaining stability and employment, they are less likely than private enterprises to shed labor during economic downturns.

Macroeconomic stability is a public good – it helps planning within private enterprises, reduces systematic risk and uncertainty, and helps smooth consumption. Importantly, when one individual or firm enjoys the benefits of macroeconomic stability they do not diminish the value of this good to other individuals/firms. Full employment can similarly be viewed as a public good; it promotes social cohesion and general wellbeing. Unemployment is associated with negative externalities such as increased crime rates, deterioration of mental and physical health, unhappiness, poverty or in cases of social safety nets an increased burden on taxpayers.

In summary, many of the stated reasons for operating SOEs or for government intervention in markets more generally, even if not framed in the language of market failures, are in fact underpinned by some form of a market failure. Similarly, socialist, welfare state, Keynesian and monetarist motivations for government intervention are implicitly based on addressing an underlying market failure, often a public good or form of externality.

2.7 A potentially welfare improving role for state-owned enterprises

Drawing together the previous subsections, Figure 3 illustrates how the market for any good can be classified into one of four categories. Markets in the first three categories – monopolies, public goods and mixed goods/externalities – fail to achieve Pareto efficiency (social welfare maximizing outcomes) when left to their own devices. In these cases government intervention may be able to increase social welfare. In all three cases government provision, whether as the producer or as the coordinator and financer of private provision, is one of the possible forms of intervention and therefore these are the markets in which there may exist an economic rationale for operating SOEs.

< FIGURE 3 HERE >

There are several inefficiencies in government provision, a point that will be expanded on later. For this reason, markets for good in the fourth category – private goods without significant externalities (with sufficient competition) – should be left to the free market. The first fundamental theorem of welfare economics indicates that the free market for goods in the fourth category is generally Pareto efficient.

It is certainly not the case that government intervention in each instance of market failure will increase economic efficiency and social welfare. Government intervention involves substantial transaction costs – the administrative costs of government structure itself, the enforcement and compliance costs of taxes/subsidies, and the various inefficiencies associated with SOEs (Stiglitz, 1988). Government intervention will only increase social welfare if the benefits of the intervention (e.g., goods produced in quantities closer to the Pareto efficient ones) exceed the costs of intervention. Therefore, in practice there are many instances of mild and moderate market failure in which the government does not and should not intervene because the costs of doing so would exceed the modest gains in economic efficiency.

2.8 Means of government intervention

Government intervention to correct market failures can take at least three broad forms: regulation, taxes/subsidies and provision. The preferred or typical means of government intervention are summarized in Figure 3. Government provision is typically the primary solution to public goods. The problems caused by monopolies and externalities can be

addressed in a less obtrusive manner using regulation and taxes/subsidies, respectively. These means are likely to be preferred to government provision when the inefficiencies in government provision are large (Shleifer, 1998). There are, however, many examples of SOEs operating in these two market categories. The remainder of the discussion will focus on government provision as that is the form of intervention that gives rise to SOEs.

Two distinctions are important in government provision. The first is between *direct* provision via SOEs or public administration, and *indirect* provision by contracting a private-sector company. The two categories are also sometimes referred to as government *production* and government *provision*, respectively. For example, clean streets – a public good – could be directly provided by a government organization that cleans streets, or alternatively the government could contract a private company to provide a defined amount of street cleaning at a certain price. Private-sector contracting has been increasingly replacing direct government provision in a large number of countries over the last two decades (Vining and Weimer, 2005). A likely driver of this trend is that, as suggested by both theory and empirical evidence, in a competitive environment private profit-oriented firms have lower costs than public or mixed-ownership organizations (e.g., Boardman and Vining, 1989; Vining and Boardman, 1992; Ohlsson, 1996; Shleifer, 1998; Domberger et al., 2002; Goldeng et al., 2008). We will go into more depth on the reasons for this later.

The tendency for the private sector to be lower-cost producers does not necessarily imply that private sector contracting is always preferable to direct public provision because contracting itself is costly – administration of public tenders, contract specification and negotiation, contract monitoring, dispute resolution, opportunistic behavior by the counterparty, corruption in public procurement and so on. A further and serious hindrance to private sector contracting is that in many instances where government provision is desirable, contracting is limited by the inability to anticipate, define, measure and enforce the desired production, particularly with regard to the quality of the good (see Sappington (2005) for a review of service quality regulation). For example, private hospitals might insufficiently treat patients for which treatment is unprofitable; privately contracted fire-fighting departments might save on training or technology and consequently be less effective in extinguishing fires.[8] Empirical studies indicate that the costs associated with contracting increase in the complexity

[8] Similar problems can arise in regulating private sector activities. For example, a regulated-price privately-operated utilities monopoly might cut costs by reducing customer service or saving on maintenance at the expense of more frequent service outages.

of the task (Brown and Potoski, 2003). However, even when contracting and regulation are imperfect or costly, the deterioration of the non-contractible quality when shifting government production to the private sector can be a small social cost relative to potentially large social gains from greater production efficiency (Shleifer, 1998). Furthermore, Klenk and Pieper (2013) suggest private provision of public goods can increase accountability of managers, compared to state provision.

A hybrid between direct and indirect provision is a variety of mixes/partnerships between the public and private sectors. An example is a Public-Private-Partnership (PPP) in which private financing is attracted for a public project. Wettenhall (2003b, 2006) argues that PPPs and other hybrids have grown in popularity as a result of some jurisdictions having effectively run out of state-owned assets to privatize, yet still wanting to continue incorporate more private sector characteristics into public sector activities. A large number of mixed public-private enterprises in many countries have been created during the last 30 years as a result of partial privatization of long established public enterprises, or simply as new enterprises (OECD, 2003; Thynne and Wettenhall, 2010; Wettenhall and Thynne, 2005, 2011).

In summary, the decision about the form of government provision – direct or indirect – should be guided by weighing up the likely savings in production costs against the total costs associated with contracting and possible quality deterioration. Direct government provision is most suited to situations in which quality or quantity of output is difficult to measure or contracts are very costly to establish and enforce.

The second distinction is between the various forms or organizational structures that are possible when *direct* government provision is the preferred intervention. It is of practical importance to distinguish between two forms of direct government provision: SOEs versus agencies, bureaus, departments and ministries, which we will refer to as government organizations.[9] Setting aside legal restrictions, which often determine the organizational form for various government activities, the choice between organizational structures should be guided by assessment of which is more effective in achieving the objectives of the government intervention. One of the important differences between the two organizational structures is that SOEs tend to have greater operational autonomy than government organizations.

[9] See Wettenhall (2001, 2003a) for a discussion of the various forms of public sector organizations and the challenges in constructing a taxonomy of such organizations. For an overview of the circumstances in which agencies and non-departmental organizations are typically created, trends in their use, and a discussion of their characteristics see Wettenhall (2004, 2005) and Thynne (2006, 2011, 2013).

There are no rigid and precise rules to determine the most appropriate organizational structure. However, a few guidelines can be extracted from practice and the collective research findings of organizational theorists (e.g., Rainey and Chun, 2005). First, the absence of an economic market for the good - one in which there is a close relation between payment for a good and the use of that good - favors structuring the activity as an organization. The absence of an economic market implies greater reliance on government financing and also less availability of market indicators (prices, profits) that are used in managerial decisions. The greater managerial autonomy that is a feature of SOEs makes them better able to respond to changing consumer demands, which can be inferred from market signals. For monopolies, payment for the good is typically closely tied to the amount of the good consumed. For mixed goods and goods with externalities the relation becomes looser due to taxes/subsidies, problems with exclusion and non-desirability of exclusion. For public goods there is often no relation between payment and use because welfare maximization requires provision at zero cost. Therefore, direct government intervention in natural monopolies tends to be in the form of SOEs whereas direct government provision of public goods tends to be via government organizations.

Second, greater emphasis on financial objectives relative to non-financial objectives tends to favor SOEs as the organizational form. Private sector entrepreneurship is driven almost entirely by profit maximization and therefore the enterprise structure has emerged as an organizational form that is suited to activities driven by financial objectives. Direct government intervention that is strongly motivated by non-financial objectives may be better realized through government organizations because pursuit of good financial performance can substantially impede achievement of non-financial objectives. Thynne (1994) proposes that one of the key challenges in using SOEs is striking "an effective mix of commercial and social objectives". Wettenhall (2001) argues that SOEs, due to their greater emphasis on financial objectives, retreat from creating social value. Despite placing greater emphasis on financial objectives than public sector organizations, SOEs must nevertheless also have a non-financial public mission. Without this, an SOE would be eventually privatized or remain an SOE only nominally, and de facto owned by a rent-seeking coalition (Del Bo and Florio, 2012).

Third, greater goal ambiguity, multiplicity and conflict favor structuring the activities as an organization. Many of the mechanisms in enterprises exist to facilitate maximization of some objective function and rewarding achievement of measurable outcomes. When the goals are vague, intangible or difficult to measure, e.g., national security, wellbeing of the poor,

public safety, clean environment, and moral correctness, the mechanisms that underpin the operation of an enterprise are less effective.

Fourth, industries or goods in which innovation is important are better suited to SOEs than government organizations because of their higher autonomy and therefore better capacity to operate in an innovative and dynamic manner as well as stronger incentives to innovate because of performance-linked rewards. There may also be benefits to SOEs stemming from private firms' preference for 'like-dealing-with-like' in organizational transactions (Thynne, 2003) and mirroring private sector organizational 'body language' (McKinlay, 1998). Finally, divisibility of SOEs' capital provides the valuable option to partially or fully privatize an SOE without much transformation (Thynne, 2011, 2013).

In summary, SOEs as a form of direct government provision are a better suited to circumstances when: (i) there exists an economic market for the outputs; (ii) the goals of the intervention are well defined and straight forward; (iii) there is a greater emphasis on financial objectives (although SOEs should always also have non-financial objectives); and (iv) there is need to be innovative and/or have regular interaction with private sector enterprises.

3. Consequences of state-owned enterprises

3.1 Two forms of efficiency

Social welfare maximization requires (i) producing the optimal mix of goods, *and* (ii) producing each good with the minimum amount of resources. The extent to which the first requirement is fulfilled by allocating productive resources to their most valuable uses is referred to as *allocative efficiency*. The extent to which the second is fulfilled by producing goods at the lowest possible cost (accounting for all of the inputs to production) is referred to as *technical efficiency*.

The fundamental welfare theorems suggest that a competitive free market (under certain conditions such as the absence of market failures), achieves both allocative and technical efficiency. Key to this outcome is consumer choice under a price mechanism and profit-seeking behavior among entrepreneurs. The price is the mechanism that signals the relative value of a good to consumers while at the same time determining the profitability of producing the good, and profit-seeking behavior drives entrepreneurs to find the least-cost combination of inputs to produce the good.

The price mechanism and profit maximization are often absent or distorted when the government is the provider of goods and therefore it is important to assess the effects of government intervention on allocative and technical efficiency.

3.2 Technical efficiency of state-owned enterprises

The technical efficiency of government provision of goods relative to private sector provision has been extensively studied in a large number of countries, periods of time and industries. The bulk of these studies find convincing evidence that government provision is associated with lower technical efficiency (for an overview of these studies, see Boardman and Vining (1989) and Vining and Boardman (1992), and for recent evidence see Goldeng et al. (2008)).

There are several reasons for the technical inefficiency of government provision, many of which are underpinned by agency costs. Agency costs arise from the imperfect alignment of incentives and information between owners and managers of enterprises (Jensen and Meckling, 1976). Managers are naturally tempted to pursue their own self-interest rather than that of owners by, for example, slacking off, making contracts and doing business with parties in which managers stand to gain, making investments just for the sake of increasing the size of the company rather than shareholder wealth maximization ('empire building'), avoiding risky (but profitable) investments, and so on. Such actions constitute a cost to owners from having an agent act on their behalf. The solutions to the problem of agency costs are to write contracts that seek to control such behavior before the fact (e.g., Vogelsang, 1983; McCubbins et al., 1987) or to invest in monitoring agents as the contract is being fulfilled (Jensen and Meckling, 1976). Agency costs tend to be larger in SOEs than private sector enterprises because SOEs often do not have in place the various mechanisms used by the private sector to reduce agency costs (Estrin and Perotin, 1991).

The first reason for higher agency costs in SOEs, and consequently lower technical efficiency, is that they are effectively insulated from two important managerial disciplinary mechanisms that exist in the private sector: (i) the market for corporate control (M&A activity); and (ii) the threat of bankruptcy (due to lack of debt and/or implicit government guarantees) (OECD, 2005). The market for corporate control reduces agency costs because if a company's management does not maximize profitability, the company will be undervalued relative to its potential creating an opportunity for a different company to realize the undervaluation by buying the company and replacing the management (Jensen, 1988). The

implicit threat to managers of losing their jobs through this mechanism or the alternative mechanism of bankruptcy if cash flows are unable to cover interest payments acts as an incentive for managers to maximize profits. The implicit (or sometimes explicit) guarantee that an SOE will be able to obtain financial assistance from the government if operational performance is poor or investments do not deliver an adequate return reduces managerial incentives to maximize the SOE's performance. This is known as the 'soft budget constraint' problem (Majumdar, 1998; Bai and Wang, 1998; Dong and Putterman, 2003; Lin and Li, 2008).

Second, supervision and monitoring of SOEs' management is rarely as strong as it is in the private sector, where shareholders and creditors have strong personal incentives to keep management disciplined and company performance high (Gupta, 2005). The ultimate beneficiaries or 'owners' of SOEs are citizens (Alchian and Demsetz, 1972). Given their large number, no individual citizen has the incentive to monitor the SOE managers because the benefits from monitoring will accrue to all owners while the costs are borne by the individuals who do the monitoring. Several studies suggest that monitoring is weaker when companies have a broad shareholder base and an absence of large shareholders (e.g., Jensen, 1989; Huddart, 1993). The weak monitoring resulting from the 'free-rider' problem is compounded by a lack of creditors that would usually monitor management to reduce the risk of not being repaid their principal.

Third, incentives of SOE management are often less closely tied to the performance of the enterprise than in the private sector, where issuing management with shares, stock options and performance-based bonuses is common practice (OECD, 2005). Standard agency theory suggests that private firms with performance-based pay will have higher technical efficiency than those without such incentives; however this result does not necessarily hold if all firms adopt performance-based pay (e.g., De Fraja, 1993), or if managers are driven largely by intrinsic motivation rather than monetary rewards (Gronblom and Willner, 2014). One of the reasons why incentives of SOE management are often less closely tied to the performance is difficulty in measuring the performance of an SOE, which includes non-financial objectives (Dong and Putterman, 2003; Bai and Xu, 2005; Lin and Li, 2008). The difficulty in measuring performance also limits the ability to monitor management and evaluate performance. Ferrari and Manzi (2014) propose that for SOEs that have non-financial objectives, performance could be measured using satisfaction of users and they suggest some statistical methods for this purpose.

Fourth, SOEs often operate in sectors in which they are protected from competition (e.g., monopolies) and therefore are not subject to the pressure of operating at the frontier of efficiency to avoid being driven out of business (Hermalin, 1982; Hart, 1983; Salas Fumas 1992; Majumdar, 1998). The trend, however, during the past three decades is for SOEs to face increasing competition (Rentsch and Finger, 2013). Fifth, information disclosure can be of a lower standard than in the private sector, which limits the ability for public scrutiny to drive efficiency.

Finally, there are reasons for technical inefficiency in SOEs that relate to the political environment in which they find themselves (e.g., Estrin and Perotin, 1991; Dinc, 2005). For example, competing owners and stakeholders with different objectives, political interference in the enterprise's operations and complicated/ambiguous ownership chain that creates uncertainty as to who bears responsibility for monitoring (Estrin and Perotin, 1991; Shleifer and Vishny, 1994; OECD, 2005).[10]

The important implication of technical inefficiency in SOEs is that less than the full potential output is produced from the resources used, or alternatively, more than the minimum amount of input resources are used to produce a certain output. The channels via which this inefficiency affects individuals are: (i) higher prices of the goods produced by SOEs relative to what they would be if SOEs operated with high technical efficiency; (ii) higher taxes to make up for the lower SOE dividends or higher SOE subsidies relative to the case of high technical efficiency; or (iii) a combination of (i) and (ii). These channels are generally unavoidable by individuals because often SOEs are the sole providers of certain goods such as utilities, infrastructure, energy and postal services, and taxes are compulsory. The welfare implications of operating SOEs are often overlooked by failing to correctly consider the opportunity costs, i.e., the alternative uses, of the capital committed to SOEs.

3.3 The effects of state-owned enterprises on allocative efficiency

While consumers naturally express their preference for certain private goods over others by deciding what to buy and thereby causing the price of goods to reflect their value to the marginal consumer, no such mechanism exists for public goods. As pointed out by Olson (1973) and recognized by OECD (2001), the value of public and non-market goods is inherently immeasurable. As discussed earlier it is not possible (or at least infeasible) and

[10] For a discussion of the different approaches to ownership and governance structures in SOEs see MacCarthaigh (2011).

undesirable to charge a fee for the use of public goods and therefore it is often impossible to determine how many individuals benefit from the good and how much they value the good. Even if consumers were surveyed on their preferences for certain goods there is no way to induce truthful responses. This is the problem of 'revealed preferences'.

Not being able to accurately measure the value to consumers of various public goods it is not possible to determine the optimal mix of public goods or the socially optimal overall quantity of public goods. Therefore, it is difficult to achieve allocative efficiency in the provision of public goods due to the absence of a price mechanism and difficulties in measuring the value of output. This is a relevant concern for SOEs because some are tasked with producing mixed and public goods.

To illustrate the difficulties in achieving allocative efficiency, consider government provision of public transport (possibly in the form of an SOE) for which the rationale often involves considerations such as reducing road congestion and reducing pollution by reducing the number of cars, both of which are public goods (or alternatively could be viewed as positive externalities). The amount that the government should spend in expanding the quantity of public transport and lowering prices relative to the free market levels depends on the value of having a cleaner environment and less congested roads, as well as the number of individuals that will enjoy these benefits, neither of which are accurately measurable. Further, suppose the government also subsidizes a vaccination program to improve public health (a public good). Should the aggregate vaccination subsidy be larger or smaller than the implicit subsidy to public transport? Now the answer depends on the immeasurable value of public health as well as that of a clean environment and uncongested roads. If the error in estimating the social value of government provision of goods is sufficiently large SOEs (and other government interventions) intended to increase social welfare by correcting market failure can in fact be harmful to aggregate social welfare.

3.4 Government failure and other consequences of state-owned enterprises

Similar to the way various imperfections prevent free markets from achieving Pareto efficiency, government interventions, including SOEs, can for various reasons fail to achieve the desired improvements to social welfare and in the extreme case harm social welfare. Collectively these reasons are known as 'government failure' (Le Grand, 1991).

Technical and allocative inefficiency in SOEs, stemming from high agency costs and imperfect information, respectively, are two forms of government failure. Further, imperfect

information and limited control over private sector responses to government intervention can lead to socially harmful unintended consequences. A simple example is rent controls intended to make housing affordable can result in shortages that leave people homeless.

A very significant government failure is the creation of rent seeking behavior – attempts by individuals, firms and organizations to extract private benefits by manipulating or influencing political processes, rather than by adding value. Rent seeking can take many forms including corruption in public procurement, political lobbying to obtain favorable decisions or policies and regulatory arbitrage or exploitation of unintended imperfections in rules and regulations (see, e.g., Datta-Chaudhuri, 1990; Tullock et al., 2002; Dal Bo, 2006; Estache and Wren-Lewis, 2009). Because rent-seeking behavior uses resources and does not create value, merely redistributes it, it decreases aggregate social welfare.

Another relevant class of government failure is various potentially welfare harming market distortions that can arise from SOEs. For example, SOEs can crowd-out desirable private sector investment even though SOEs may operate at a lower level of technical efficiency than private sector competitors (Atukeren, 2005). This can occur as the result of implicit advantages of having the state as the owner, including: (i) implicitly subsidized capital such as debt at below market rates (due to implicit government guarantees and soft budget constraints) and government equity injections at non-market rates; (ii) subsidies and grants; (iii) preferential access to government contracts; and (iv) favorable regulation (Bortolotti et al., 2013).

3.5 Summary of the consequences of state-owned enterprises

In summary, government provision of goods, including the operation of SOEs, is likely to involve some degree of technical and allocative inefficiency as well as various forms of government failure. This does not simply imply that the state should not operate SOEs, but rather that the effects on efficiency and various failures must be taken into consideration when deciding upon government intervention. If the benefits of government provision, such as welfare gains from correcting market failure, exceed the costs including the effects on efficiency the government intervention can be beneficial to social welfare. In the converse case SOEs can be harmful to aggregate social welfare, and even in the presence of market failures society may be better off without particular SOEs.

4. Framework for the use of state-owned enterprises

The framework for assessing the appropriateness of SOEs in a given set of circumstances draws on the discussion throughout this article. The framework, like most of the earlier discussion takes welfare maximization as the government's objective. It consists of five steps and is schematically illustrated in Figure 4.

< FIGURE 4 HERE >

Step 1: Is there a substantial market failure?

The main economic rationale for the existence of SOEs is to correct market failure, i.e., situations in which a free market left to its own devices would produce suboptimal outcomes with respect to social welfare. The most relevant market failures are: (i) monopolies, or a lack of competition; (ii) externalities, or unintended side effects of production or consumption; and (iii) public goods, which are defined as having the characteristics that it is infeasible or undesirable to exclude individuals from consumption and one individual's consumption does not lessen the ability for another individual to consume the good. In the absence of competition, prices are higher and production quantities are lower than is socially optimal, goods with externalities are under- or over-produced relative to the optimum, and public goods are not be produced at all or under-produced at best.

The objectives of most SOE fit into the previously mentioned market failure categories even if no explicit reference is made to monopolies, externalities or public goods. For example: 'strategic' goals often implicitly refer to the production of national security, a public good; 'equity' and 'equality' goals correspond to the public good of social stability, cohesion and wellbeing; and establishing 'infant industries' is a form of positive externality.

In the presence of market failure government intervention, including the use of SOEs, has the potential to increase social welfare, i.e., make society as a whole better off. On the other hand, in the absence of a substantial market failure production should be left to the free market, because in such cases there are no substantial benefits from government intervention, yet there are administrative costs, technical inefficiency, potential for government failure, and distortions that can decrease aggregate welfare.

Step 2: If there is a substantial market failure, can it be resolved with regulation or targeted taxes/subsidies?

Government provision, including through the use of SOEs, is one of several forms of government intervention that can be used to correct market failure. Alternatives include regulation of prices and specifically targeted taxes/subsidies. Generally, government provision is best suited to public and mixed goods (impure public goods). Although government provision can also be used as a solution to monopolies and externalities, regulation and taxes/subsidies, respectively, are preferable alternatives when the costs and inefficiencies associated with government provision are substantial. Decades of international experience indicate that private enterprises driven by profit incentives provide goods more efficiently than SOEs, which are typically subject to weak governance arrangements, soft budget constraints, conflicting and ambiguous objectives, and a lack of accountability. The technical inefficiency of SOEs harms individuals via higher prices for goods and/or higher taxes, relative to the case of high technical efficiency. For this reason when it is possible to mitigate a market failure using regulation, taxes or subsidies, it is often preferable to do so, leaving production to the private sector.

Step 3: If regulation or taxes/subsidies are not feasible solutions to a substantial market failure, are there substantial hurdles/costs in defining quantity and quality of the good or in enforcing a private sector provision contract?

Government provision can be indirect, e.g., contracting private sector firms, or direct, e.g., provision by SOEs, agencies, bureaus, departments and ministries. Private sector contracting, when feasible, is often preferred to direct government provision because the private sector tends to be a lower costs producer, i.e., operate with higher technical efficiency. However, private sector contracting is not feasible when it is not possible to define and measure the quantity/quality of the good or when the costs of establishing and enforcing a private sector provision contract are excessive. In such situations direct government provision is the only practical option.

Step 4: If direct government provision is the most feasible option, to what extent is there: (i) an economic market for the good; (ii) a set of well-defined, straight-forward goals of intervention; (iii) relatively large emphasis on financial objectives; and (iv) need to be innovative?

Of the various ways to organize and structure direct government provision, SOEs are better suited to situations in which there exists an economic market for the outputs, the goals of the government intervention are relatively simple, a relatively large emphasis is placed on financial objectives relative to non-financial ones, and there is a need to be innovative.

Step 5: In using an SOE to correct market failure, do the welfare losses from government failure, rent-seeking, and government intervention induced technical/allocative inefficiency exceed the welfare losses due to the market failure?

SOEs have several consequences on individuals, markets and private sector firms. Their technical inefficiency can result in loss of social welfare if the gains from correcting the market failure are not sufficient to offset the loss in efficiency. SOEs, like any other government intervention, can induce unproductive or even destructive rent-seeking behavior among individuals and private sector firms. Finally, SOEs can crowd out private sector investment, even when private sector firms are more efficient, due to various implicit advantages of state ownership. If the welfare losses due to these negative consequences exceed the welfare gains from correcting the market failure, welfare maximization requires not operating the SOE and allowing the market failure to persist.

5. Conclusions

State-owned enterprises (SOEs) remain an important part of many economies and have recently been rediscovered by many governments as useful instruments for dealing with specific policy objectives. This paper presents a five-step framework that can guide policymakers and economic advisors in making decisions about maintaining and/or creating SOEs, under the objective of maximizing social welfare.

The use of SOEs should be limited to circumstances in which a market failure exists. We argue that in many cases where the stated reasons for the existence of an SOE are not explicitly framed as market failures (e.g., reasons such as a ‘strategic’ role, a ‘development’ role, industrial policy, and national security), the rationale underpinning the SOE is in fact a form of a market failure. Similarly, socialist, welfare state, Keynesian and monetarist

motivations for government intervention are implicitly based on addressing underlying market failures, often a public good or a form of externality.

In addition to the existence of a market failure, our five-step framework advocates using SOEs only when less invasive forms of intervention such as regulation/taxes/subsidies and private sector contracting are ineffective or not possible. Finally, under a welfare maximization objective, operating an SOE is only justified when the welfare loss of the market failure exceeds the costs, distortions and inefficiencies associated with the SOE.

Given the considerations above, SOEs are most likely to be beneficial to society when: (i) the market failure that motivates their existence is substantial; (ii) alternative forms of government intervention such as regulation, taxes/subsidies and private sector contracting are infeasible; (iii) state ownership and management is conducted in a manner that minimizes inefficiency due to agency costs; and (iv) risks of government failure and rent-seeking are low. An implication for cross-country comparisons is that holding the magnitude of market failure and effectiveness of alternative interventions constant, the optimal number of SOEs should be smaller when mechanisms for their management are less developed and risks of rent-seeking and other government failure are larger.

The market failure rationale implies that SOEs will necessarily have non-financial objectives. If an SOE were to have only profit maximization objectives it would be in society's best interests for the enterprise to be owned and operated by the private sector. Therefore, the performance of SOEs cannot be evaluated using only financial indicators as is common for private sector firms.

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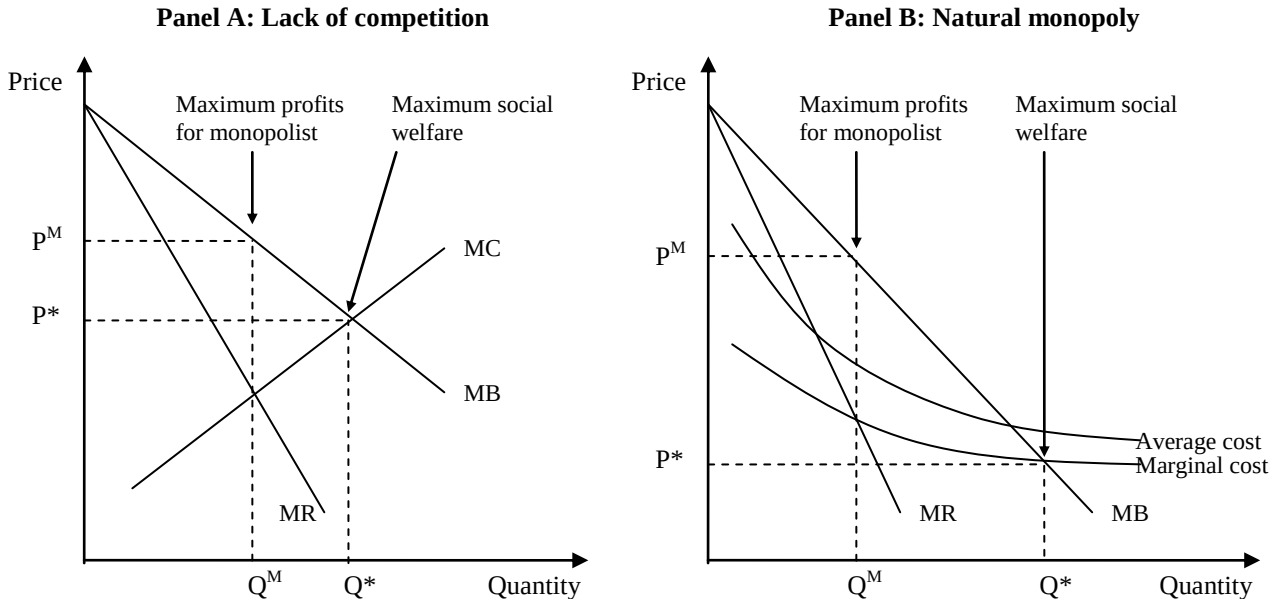


Figure 1. Illustration of Pareto inefficient outcomes caused by a lack of competition (Panel A) and natural monopolies (Panel B). MB = marginal benefit; MC = marginal cost; MR = marginal revenue. Social welfare is maximized at the point where MB=MC (P*, Q*), but the monopolist's profits are maximized at the point where MC=MR (P^M, Q^M).

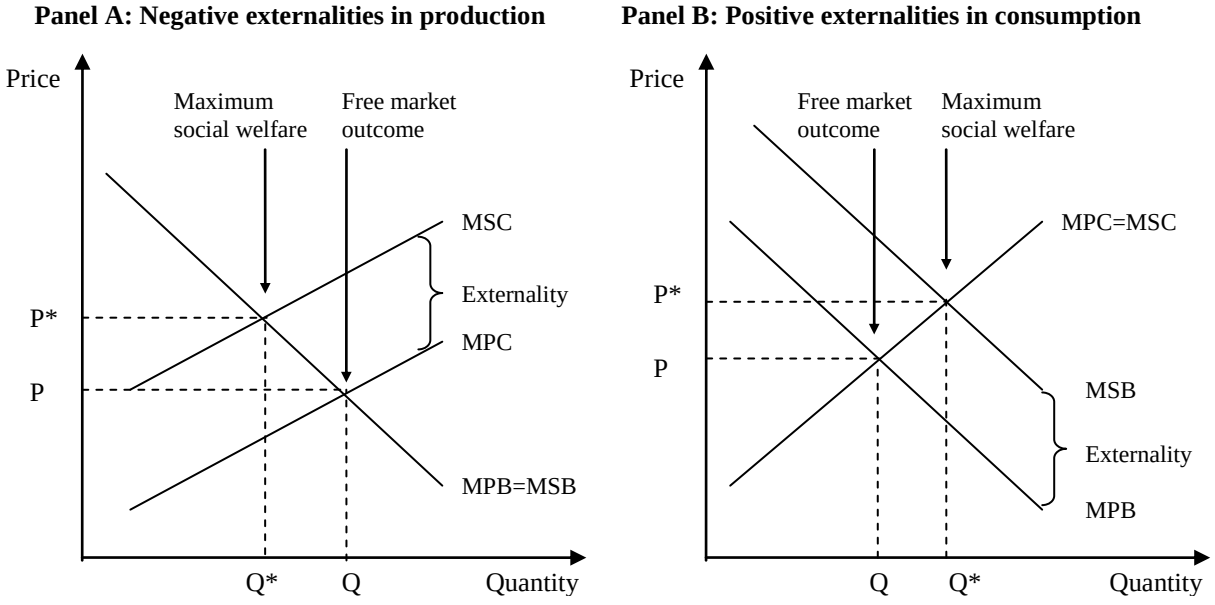
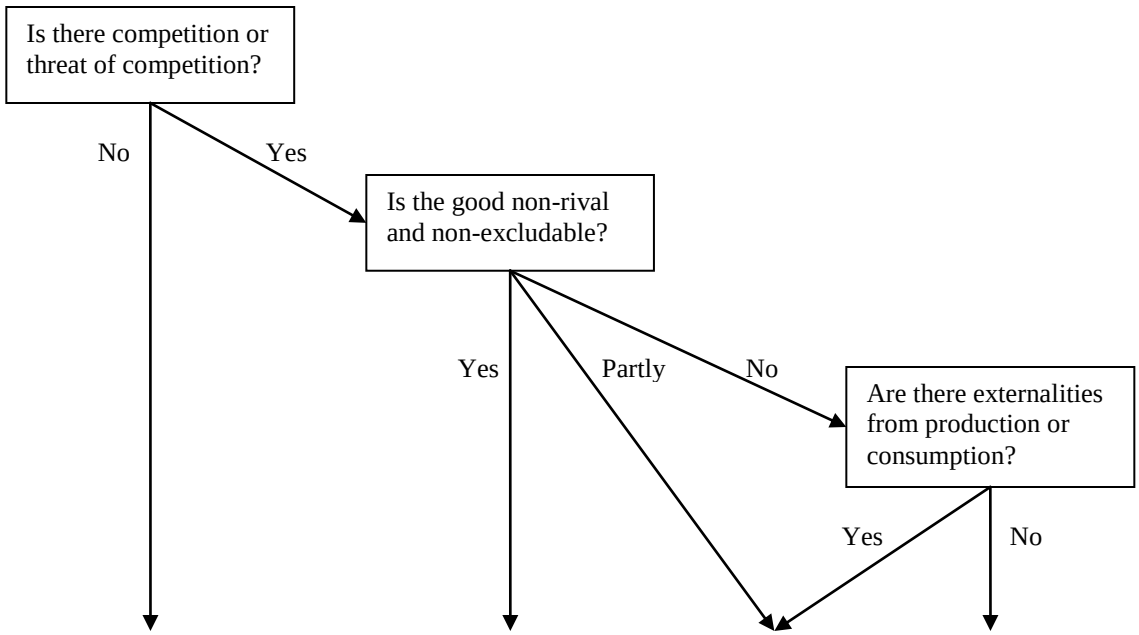


Figure 2. Illustration of Pareto inefficient outcomes caused by externalities. MPB = marginal private benefit; MSB = marginal social benefit; MPC = marginal private cost; MSC = marginal social cost. Social welfare is maximized at the point where MSB=MSC (P*, Q*), but in the presence of externalities a free market will produce at the point where MPB=MPC (P, Q).



	Monopolies	Public goods	Mixed goods / externalities	Private goods without externalities
Does a free market achieve Pareto efficiency?	No	No	No	Yes
Is there potential for government intervention to increase economic efficiency?	Yes	Yes	Yes	No
Typical forms of government intervention	1. Price regulation (possibly with subsidy) 2. Provision	1. Provision	1. Taxes / subsidies 2. Provision 3. Quantity regulation	None
Relation between payment and use of the good	Full	None	Close	Full

Figure 3. Taxonomy of key market failures and corresponding forms of government intervention.

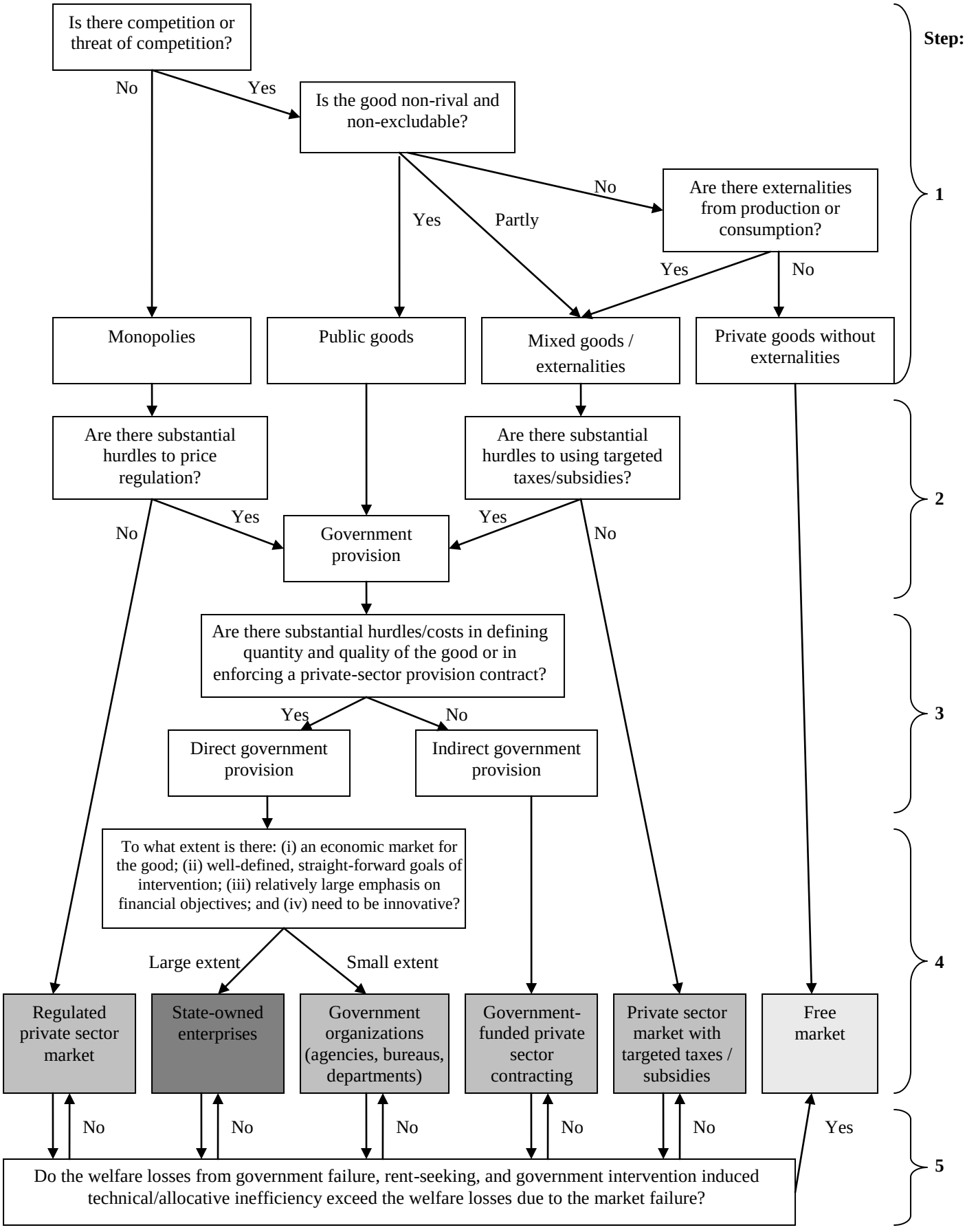


Figure 4. Framework for assessing the appropriateness of state-owned enterprises in a given set of circumstances, under a welfare maximization objective.