

Market imperfections, government imperfections, and policy mixes: policy innovations in Singapore

Xun Wu · M. Ramesh

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Abstract Proper roles for government and market in addressing policy problems may be assessed by considering the duality between market imperfections and government imperfections. The potential of government interventions or market mechanisms as core policy instruments can be eroded by fundamental deficiencies deeply rooted in either government or market as social institutions. The impacts of such deficiencies are much more extensive than postulated by the existing theories. Analysis here, based on policy innovations in land transport and health care in Singapore, suggests how policy mixes might become the norm of response for addressing policy problems found in a range of sectors. The analytical framework presented may help to distinguish among different policy mixes according to their effectiveness, but also provides some useful guiding principles for policy design.

Keywords Policy mix · Market imperfections · Government imperfections

Introduction

The recent global financial crisis has intensified debate over the proper roles of government and market in governing the economy. Although there is a consensus on the immediate causes that triggered the crisis, scholars and commentators have been sharply divided in their assessments of its root causes. Some view the crisis as clear evidence of market failures (Stiglitz 2011; Lounsbury 2010); others attribute the root causes of the problem to counterproductive government interventions or to government failures (Taylor 2009).

X. Wu (✉) · M. Ramesh
Lee Kuan Yew School of Public Policy, National University of Singapore, 469C Bukit Timah Road,
Oei Tiong Ham Building, Singapore 259772, Singapore
e-mail: sppwuxun@nus.edu.sg

M. Ramesh
e-mail: sppmr@nus.edu.sg

These divergent opinions are in part fueled by a failure to reconcile some critical differences among a few of the major theories that guide policy decisions. For example, whereas applications of the theory of market failures point to the need to expand the scope of government interventions to correct market failures, insights from public choice theory suggest that government interventions often fail to achieve their objectives, due to principal–agent problems and self-interest among politicians and government officials (Acemoglu and Verdier 2000; Datta-Chaudhuri 1990; Krueger 1991; Zerbe and McCurdy 1999). Some scholars argue that it might be better to leave the market alone, despite clear evidence of market failures due to government failures in cases where government interventions would worsen the situation (Friedman 2009; Becker and Murphy 2009). But recurring disastrous outcomes such as the recent financial and economic crises suggest that the consequences of ignoring market failures can be just as deadly.

We address recent discussions on the proper roles for government and market by presenting a conceptual framework that features the duality between market imperfections and government imperfections. From this standpoint, it can be argued that the potential of government interventions or market mechanisms as main policy instruments can be eroded by some fundamental deficiencies deeply rooted in either government or market as a social institution and, further, that the impacts of such deficiencies may be much more extensive than postulated by existing theories.

We apply this framework to policy development in two policy sectors in Singapore, land transport and health care, in order to explore the proper role of market and government in the present context. These two sectors were chosen because traffic congestion and escalation of health care expenditures are among the major policy challenges confronting most if not all countries in the world today. The creative ways in which the island republic has dealt with these problems, using market-centered efforts to offset and complement government-centered measures, and vice versa, offer instructive insights into the use of policy innovations combining government interventions and market mechanisms.

Our analysis suggests how policy mixes might become the norm of response to addressing policy problems found in a range of sectors. Because of the duality between market and government imperfections, effective solutions to policy problems may lie in the use of a mixture of policy instruments that not only can address market and government imperfections simultaneously, but also can likewise take the advantage of the strengths of both market and government. The framework presented here is designed to distinguish among different policy mixes according to their policy effectiveness and also to provide some useful guiding principles for policy design.

The duality of market imperfections and government imperfections

The theory of market failures has occupied a central place in the study of public policy for several decades (Weimer and Vining 2005). The theory postulates that the pursuit of private interests leads to inefficient outcomes under circumstances such as the provision of public goods, natural monopoly, externalities, and information asymmetry and that government interventions can be used to correct these problems. The theory of market failures is used widely not only as a diagnostic tool for analyzing policy problems but also as an analytical tool for making policy choices (Kleiman and Teles 2008).

The dominance of the theory of market failures in guiding policy decisions has been challenged by scholars from various intellectual traditions. Some argue that the efficacy of governments in solving problems associated with market failures cannot be taken for

granted because of principal–agent problems in public affairs (Mueller 1976; Osborne 1993); others point to the exclusive focus on economic efficiency as a major limitation of the theory of market failures, as this obscures other equally important goals, such as distributional equity and social justice, that are pursued by governments (Wolf 1987; Grand 1991). There are also other circumstances in which markets fail to produce optimal outcomes because of the illusive nature of a competitive market (Weimer and Vining 2005).

Criticisms of the theory of market failures have led the development of a public sector analogy of “government failures”: government interventions may result in inefficient outcomes due to principal–agent problems and lack of competition in the public sector (Wolf 1987; Grand 1991; Vining and Weimer 1990). Compared to the theory of market failures, however, the concept of government failures has not been extensively tested, and thus, its applications in policy analysis have been rather limited. One major shortcoming of a theory of government failures as a diagnostic tool in policy analysis is the absence of a clearly defined norm that would serve as a basis for determining the nature and extent of such failures. Another shortcoming is that the concept of government failures, like the theory of market failures, is focused exclusively on a criterion of efficiency.

In response to the evolving discussion to date on market failures and government failures, the alternative framework presented here focuses on the duality, or reciprocal aspects, of market and government imperfections (see Fig. 1). *Market imperfections* here refer to a set of inherent deficiencies of market, as a social institution, in solving policy problems. The first of these deficiencies or imperfections is that the use of market mechanisms will cause a loss of economic efficiency when conditions for market failures, such public goods externalities, natural monopoly, and information asymmetry, are present. Second, markets on their own cannot be relied on in pursuing policy goals other than economic efficiency, such as equity, social justice, and security. Third, the presence of market power is more widespread than can be accounted for in the narrow circumstances defined by market failures, because a “perfectly competitive market” is often illusive in practice. Fourth, although the transaction costs involved in enabling exchange between buyers and sellers can be prohibitively high, these are often neglected when market mechanisms are considered (Zerbe and McCurdy 1999). Fifth, the use of market mechanisms in the financing and provision of essential public services, such as water, social security, and health care, may be met with strong public opposition that will undermine their effectiveness. Sixth, although rationality is the cornerstone of any market mechanism aimed at achieving efficient outcomes, the actual experience of market participants may confront the policy maker or decision maker with a variety of limitations that can severely undermine the potential of market mechanisms.

Government imperfections, on the other hand, refers to a set of inherent deficiencies deeply rooted in government itself as another social institution engaged in approaching policy problems. First, the effectiveness of government interventions depends critically on the ability of governments to access the information necessary for policy decisions, but that capability cannot be taken for granted even for governments with sufficient resources to do so (Kleiman and Teles 2008). Second, principal–agent tensions are pervasive in government, because of the challenges of measuring and monitoring performance in the public sector (Wolf 1987); this raises concerns regarding poor performance and rent seeking (Acemoglu and Verdier 2000; Krueger 1991). Third, as with market power, the pressures from organized interests or special interest groups may undermine the effectiveness of government interventions. Fourth, similar to the problem of neglect of transaction costs in the case of market mechanisms, administrative costs in government interventions can be

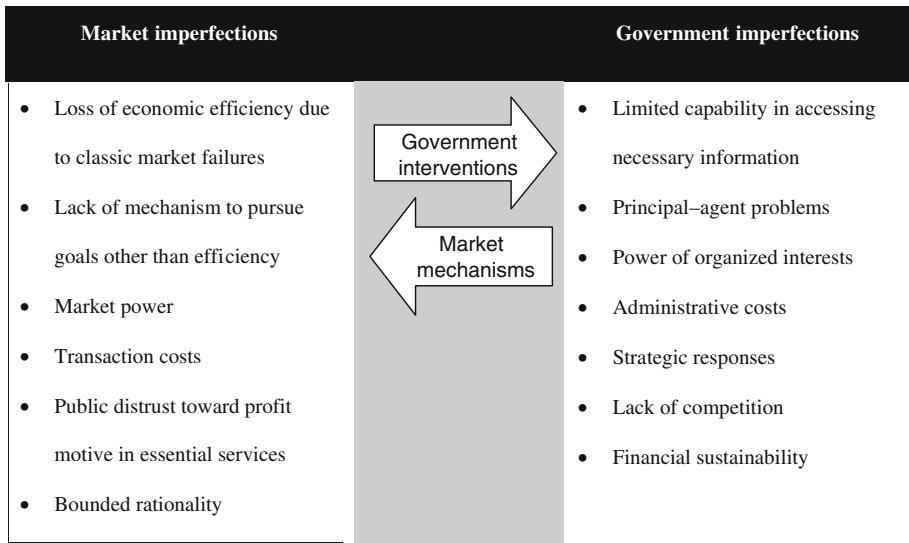


Fig. 1 Market and government imperfections

substantial but are often disregarded (Krueger 1991). Fifth, because many forms of government intervention are based on monopolistic arrangements, their effectiveness may be undermined due to a lack of competition. Sixth, although effective government interventions depend on the voluntary cooperation by the general public, expectations of willing public cooperation can be a source of weaknesses (Kleiman and Teles 2008), and government interventions may inadvertently elicit strategic counter-responses from those affected. Seventh, many forms of government intervention—such as subsidies, grants, or public provisions—require budget outlay from the government, but their financial sustainability cannot be taken for granted.

The categorization of market and government imperfections shown in Fig. 1 provides insights into some sources of tension over the proper roles of government and market in solving policy problems. Inherent deficiencies of both market mechanisms and government interventions give rise to what might be called the *duality problem*. On the one hand, market imperfections require the use of government interventions such as regulation, direct provision, and taxation, but the effectiveness of these interventions may be undermined by attendant government imperfections. On the other hand, while government imperfections give rise to the need to adopt market mechanisms (Wallis and Dollery 2002), such as privatization, user charges, and deregulation, as remedies, such mechanisms are in turn subject to market imperfections.

The framework of the duality of market imperfections and government imperfections as schematized in Fig. 1 differs from the existing literature on market failures and government failures in several important aspects. First, the framework looks beyond efficiency as the criterion for assessing policy effectiveness. For instance, although it includes loss of efficiency associated with classic market failures as among the inherent deficiencies of markets, the framework also considers areas where the main concern is not economic efficiency. Second, although the framework construes market and government imperfections as inevitable threats or risks associated with different policy responses, it also uses these failures to identify shortcomings to be avoided through policy responses. Third, the

framework provides a systematic way to compare both market and government as alternative social institutions for solving policy problems.

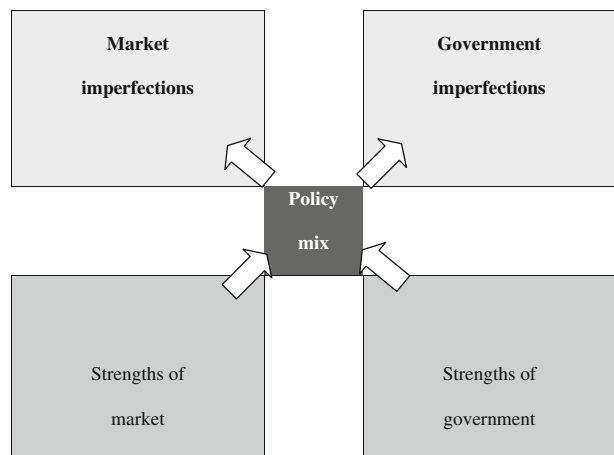
This suggested duality between market and government imperfections offers justification for more extensive use of policy mixes, as any single policy instrument aimed at addressing either market or government imperfections will inadvertently and inevitably induce the effects and the imperfections of the other. For example, the presence of natural monopoly (resulting from market imperfections) necessitates regulation, which is potentially subject to several government imperfections, such as information asymmetry and rent-seeking behavior on the part of producers. The inherent government imperfections, in turn, call for use of measures such as competitive bidding and yardstick competition to offset the government's shortcomings. Policy mixes consisting of regulation, competitiveness bidding, and yardstick competition are thus necessary to correct the duality problem in monopoly sectors.

In addition to addressing concerns over the duality between market and government imperfections, the design of policy mixes may also include consideration of how to take advantage of the strengths of both market and government. The strengths of the market may include the following: (1) efficiency gains from competition, (2) freedom of choices for consumers, (3) faster responses to changing circumstances, and (4) financial sustainability in service provision. Strengths of the government include the following: (1) economy of scale at the societal level, (2) pursuit of goals other than economic efficiency, (3) quick and sure change due to the use of coercive power, (4) the ability to alter incentive structures, and (5) accountability to a public majority in some cases.

These strengths of market and government mechanisms provide another compelling reason for the use of multiple policy instruments, that is, policy mixes, as a policy response to the duality between market and government imperfections. Policy instruments based on the strengths of the market can be combined with those based on the strengths of the government to benefit from both while also minimizing their respective disadvantages. Because market mechanisms are employed to deal with government failures, and government intervention is used to reduce the impacts of the market failures, it is possible simultaneously to take advantage of both (Fig. 2).

The framework presented in Fig. 1 also suggests some useful guidelines for policy design, as multiple policy instruments may be available for addressing the same policy

Fig. 2 Balancing market and government imperfections through innovative policy mix



problem, thus offering components to create a standard for comparison. Different policy instruments may perform differently, *ceteris paribus*, when combined differently. Some instruments, for example, perform well in tackling market imperfections but are prone to government imperfections; other instruments may be moderately effective in tackling market imperfections but are subject to less severe government imperfections. Criteria for comparing different policy instruments as well as policy mixes could include the following: (1) addressing market imperfections, (2) addressing government imperfections, (3) taking advantage of market strengths, and (4) taking advantage of government strengths.

Innovative policy mixes in Singapore

Singapore is well known for its enthusiastic adoption of measures in land transport and health care that have been subsequently emulated elsewhere. For instance, Singapore was the first country in the world to adopt congestion charges to remedy traffic problems and to institute medical savings accounts, which are now being considered in many countries. What is less well known is that these achievements are based not on the use of single policy instruments but on how core policy designs are combined with other, complementary instruments.

Land transport

Traffic congestion is a way of life in many cities around the world despite the significant costs in terms of time, energy, and pollution that it imposes on governments, businesses, and individuals. Recent estimates set traffic congestion costs in the United States at US\$78 billion annually, and congestion accounts for as much as 1 % of GDP in the United Kingdom (Tan 2009). Yet governments find it difficult to address traffic congestion because it is in many ways a classic wicked problem. Many cities have implemented infrastructural projects such as road-widening and additional expressways, only to find that such solutions may ease congestion in the short run but aggravate the problem over time, as more cars are bought and driven and are attracted to the improved road network. Singapore's experience in tackling traffic congestion offers an opportunity to examine the relevance of the duality between market and government imperfections in addressing the problem.

Traffic congestion is often included in economics textbooks as an example of externalities whereby road users disregard the negative impacts of their actions on others. The recommended corrective for the negative externality is regulation and taxation of car ownership and usage. The effectiveness of these government interventions may be undermined by government imperfections, according to the duality between market and government imperfections.

Due to rising household income and unreliable public transport, the private vehicle population in Singapore roughly doubled from 70,100 to 142,500 between 1960 and 1970 (Santos et al. 2004). The government introduced an Additional Registration Fee (ADF), a percentage (15 %) of the Open Market Value (OMV) of vehicles, in 1968 as a surcharge aimed at bringing down the rate of increase in vehicle population, which can be interpreted as the use of government intervention to correct a market failure, an externality. However, the ADF's effectiveness was undermined by several government imperfections, such as inadequate access to information needed to determine the right amount of additional charge and to gauge strategic responses. In response to pressures in demand for car ownership, the

government aggressively increased the ADF to 25 % in 1972, 55 % in 1974, 100 % in 1975, 150 % in 1980, and 175 % in 1983, but it rapidly became clear that the effects of this strategy for curbing growth of the number of private cars on the road were quite limited, although it would be politically unwise to continue increasing ADF in such a manner. No less significantly, as ADF applied only to new cars, the policy discouraged existing vehicle owners from replacing their cars and encouraged prospective purchasers to buy used cars only, thus contributing to air pollution from a growing population of older, less fuel-efficient vehicles (Santos et al. 2004).

In addition to ADF, the government introduced the Area Licensing Scheme (ALS) in 1975 to control the usage of vehicles. Under ALS, an individual vehicle owner must purchase a permit to drive into any designated “restricted zone” during peak hours. Although the scheme was quite effective initially due to the relatively high level of the fee for permits (Seik 1998), the government found it difficult to expand deployment of ALS due to high costs of enforcement and the development of strategic behavior among car owners—an instance of government imperfection.

In 1990, the government decided to add a further extreme measure, the Vehicle Quota System (VQS), into the policy mix, in part due to the failure of existing policy instruments to reduce traffic congestion and in part due to the limited parking provisions in Housing Development Board (HDB) estates. Under VQS, prospective vehicle owners are required to purchase a ten-year license called a Certificate of Entitlement (COE), and the number of COEs available for purchase is determined by the government on the basis of prevailing traffic conditions and road capacity, thus placing the total number of vehicles in the county under the direct control of the government. The effectiveness of this policy derives from the strengths of government, as it would have been impossible for market mechanisms to guarantee such a definite outcome. Still in place today, VQS is the single most important factor contributing to low car ownership in Singapore. As a result of the mix of related policy measures in place, the car ownership rate in Singapore is the lowest among high-income countries worldwide: 101 cars per 1,000 persons, compared to 441 in Japan and 461 in the United States in 2010 (Table 1).

While the ceiling set on the number of cars sold in a given time period is effective in dealing with the externality problem, the allocation of COEs entails significant risks due to the potential for government failures. The scarcity of COEs offers rent-seeking opportunities for organized interests, even corruption. The Singapore government has dealt with these concerns through the use of a competitive bidding system whereby potential buyers must bid for a COE in public tender (Lam and Toan 2006). The use of this market mechanism (auction) not only protects the system against government imperfections but also takes advantage of the strengths of the market by allowing the COE premium to be

Table 1 Car ownership in selected countries, 2011

	GNI per capita, PPP (current International \$)	Passenger cars per 1,000 people
Singapore	59,380	101
South Korea	29,920	230
Malaysia	15,560	225
Japan	34,670	441
United Kingdom	35,950	457
United States	48,820	461

The World Bank, The Little Green Data Book, 2012

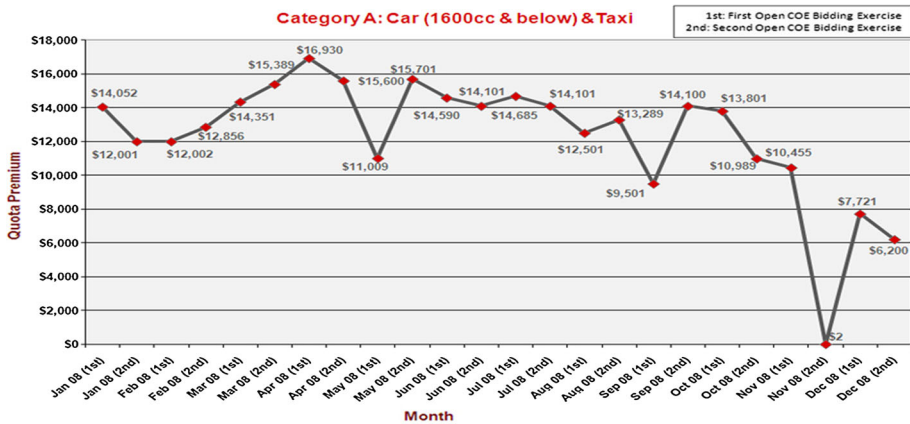


Fig. 3 Price of Certificate of Entitlement (COE) over the course of a single year (2008) *Source* LTA, Singapore

more responsive to fluctuations in demand and supply. Figure 3 shows fluctuations in the COE premium over the course of a single year.

Advances in information technology revitalized policy instruments aimed at controlling the usage of vehicles in Singapore. In 1997, the government introduced Electronic Road Pricing (ERP) to replace the permit-based systems such as ALS. Under ERP, a unit detectable by sensors stationed on gantries over roads and expressways is installed in all vehicles, and these sensors deduct charges automatically from the driver's cash card (inserted into the unit) as the vehicle passes beneath the gantries. There were about 70 gantries in the country in 2012. ERP charges are set to encourage the optimal level of road speeds. It was decided that to optimize road usage, speed limits should be set at 20–30 km/h on a basket of Central Business District (CBD) roads and at 45–65 km/h on expressways.

ERP charges vary by location of gantry as well as by time, based on traffic volume: when speed exceeds the upper threshold, ERP charges should be reduced to allow more vehicles to use the roads; when the speed falls below the lower threshold, a sign of traffic congestion, the charge should be increased. Statistics show that the ERP is quite effective in controlling traffic volume: in 2011, the average speed during the peak hours was 62.5 km/h for expressways and 28.5 km/h for arterial roads (LTA 2012). More important, the combination of VQS and ERP enables the government to balance between vehicle ownership costs and usage charges to minimize the costs of these measures on car owners.

A major criticism of the use of a market mechanism (competitive bidding) in allocating COEs is concerned over distributional equity, one of the market imperfections, as low-income households are bid out of the market for vehicles altogether (Santos et al. 2004). The rapid development of public transport is a part of the government's strategies to address such concerns. High standards are specified to guide route design, scheduling, and safety for public transport. For example, government guidelines state that "HDB towns must have MRT and/or bus services that directly connect with city center," "peak hour passenger load must not exceed 100 % of the bus's designated capacity," and "route must be direct, not more than 30 % longer than comparable trips by car."

Using a mix of policy instruments in controlling car ownership and usage thus has also provided ridership and political support for the development of public transit. The promotion of public transport has been pursued internationally in almost all cities suffering

from traffic congestion, but such measures are rarely effective because individual car ownership and usage are allowed to remain attractive options. Without active policy measures aimed at controlling car ownership and usage, it is a wishful thinking to believe that the development of public transit will provide sufficient incentives for car users to switch to public transport.

Table 2 summarizes the policy mixes used to tackle traffic congestion problems in Singapore, in the framework of the duality between market and government imperfections.

Health care

Health care is regarded as one of the most challenging of all policy problems because there is no known way of responding adequately to all contending pressures. Efforts to curtail unnecessary demand have the inadvertent effect of making health care inaccessible, especially to those who need it the most and can afford it the least. Similarly, efforts to assist users have the inadvertent effect of disadvantaging providers. Measures that improve service quality through competition among providers and/or insurers inexorably raise total expenditures and worsen access for those who cannot afford services. Government provision of health care is handicapped by bureaucratic pathology of unresponsiveness and inefficiencies. Government financing can maintain access, but in the long run the government will pose fiscal difficulties unless it imposes controls over both providers and users. However, such a high level of intervention is fraught with the risk of falling prey to government imperfections that will worsen the conditions for all stakeholders.

Singapore fares well among countries that have tried to contain total health expenditures while still maintaining reasonable access, a conclusion borne out by international comparison of health systems (WHO 2000). The effects of Singapore's reforms are evident in their outcomes, which are excellent on most dimensions. Its infant mortality rate (2 per 1,000) is one of the lowest in the world, and average life expectancy (82 years) is one of the highest (see Table 3). This has been achieved at a relatively small cost: total health expenditures formed only 3.3 % of the GDP in 2008, less than one-half of the Organization for Economic Cooperation and Development (OECD) average. Even when adjusted to account for a relatively high per capita income, Singapore's expenditures on health care are only half of what would be predicted for a country at its income level (Wagstaff 2005: 4). The government achieved the outcome through a creative policy mix of government intervention and market mechanisms.

Table 2 Singapore's mix of policy instruments for confronting traffic congestion

	Market mechanisms	Government interventions
Policy instruments	Auction market to allocate Certificates of Entitlement (COEs) Electronic Road Pricing (ERP)	Additional registration fee
Market or government imperfection requiring response	Information asymmetry Rigidity	Externality
Strength of market or government	Sensitivity to changes in demand and supply Allocative efficiency Flexibility	Certainty

Table 3 Singapore's health care performance in comparative perspective

	Gross national per capita income ^a			Total expenditure on health care as % of GDP		Infant mortality rate ^b		Life expectancy at birth ^c	
	1990	2000	2011	1995 (%)	2010 (%)	1990	2011	1990	2011
China	800	2,340	8,390	3.5	5.0	39	13	68	76
India	860	1,500	3,620	4.1	3.7	81	47	58	65
Japan	18,820	25,690	34,670	6.8	9.2	5	2	79	83
South Korea	7,690	15,444	29,920	3.7	7.1	6	4	72	81
Singapore	17,410	32,350	59,380	3.6	4.5	6	2	75	82
Canada	18,750	27,960	39,710	9.0	11.4	7	5	77	82
United Kingdom	16,330	24,870	35,950	6.9	9.6	8	4	76	80
United States	22,940	35,190	48,820	13.3	17.6	9	6	75	79

WHO, World Health Statistics, 2013

^a PPP in international \$

^b Per 1,000 live births, both sexes

At the time Singapore attained independence in the mid-1960s, its health care system was dominated by the public sector in hospital care and by the private sector in outpatient care; that legacy continues to the present. The cost implications of the government's shouldering the bulk of hospital care costs became evident in the early 1980s, following a rise in the incidence of debilitating diseases and a growing realization that the country's population was aging. Reforms initiated at that time have been continued zealously over the three decades since (Ramesh 2008).

Concerted reform of public hospitals in Singapore began with the launch of the National Health Plan in 1983. The plan's analysis of the sector's problems centered on government failures characteristic of public health care systems: inefficiency, unresponsiveness, and rising expenditures due to lack of market competition (Hsiao 1995). The plan's designers argued that government financing and inflexible government controls, along with lack of competition among hospitals, had promoted complacency, unresponsiveness, and overall inefficiency.

To put the plan into effect, the government started with a gradual but steady increase in user charges in public hospitals, so as to recover a greater portion of operating expenses. This and other measures were designed to confront the perceived limitations of publicly provided and publicly financed health care. However, such measures necessitated financing reforms in order to help households pay for the increased user charges that were introduced in the following years.

The financing reforms started with the launch of a compulsory savings program called Medisave in 1984. The program compels every employed person to set aside 7–9.5 % (depending on age group) of monthly income into a personal Medisave account. Funds in the personal account may be withdrawn to meet costs of hospitalization, day surgery, and certain outpatient procedures for the individual or a family member. Medisave is intended to address the problem of moral hazard among users and reduce the government's fiscal burden.

In 1990, following the realization that a vast majority of the population did not have sufficient funds in their Medisave accounts to pay for treatment of illnesses involving high

costs, the government launched MediShield. It is a catastrophic illness insurance scheme with a large number of exclusions and a high co-payment and deductible to keep premiums affordable. MediShield is intended to curb the moral hazards of insurance while still providing financing for those suffering from illnesses with high treatment costs. The government also created a small public assistance scheme called Medifund, established in April 1993, for persons unable to afford care due to lack of personal or Medisave savings. Even so, Medisave, MediShield, and Medifund together form <10 % of the country's total health care expenditures. Direct funding from the government budget remains the largest source of health care financing after out-of-pocket payments. The government distributes these subsidies largely through transfers to hospitals to compensate for the losses they incur in operating Class B and C wards, which recover only between 20 and 80 % of their costs from users.

The reform of public hospitals to reduce their government-centered deficiencies has been a more complex and protracted process. In 1985, the government established a nonprofit holding company, Health Corporation of Singapore Private Limited (HCS), for the purpose of owning public hospitals and overseeing their operation. HCS was registered as a private company, with the government as the complete owner. In turn, HCS owned individual public hospitals that were also registered as separate private companies with broad operational autonomy. Over the next fifteen years, all public hospitals were gradually corporatized and put under HCS ownership. Each corporatized hospital was fully autonomous with power to recruit staff, set rates of remuneration, and decide on deployment of resources. Each hospital's management was accountable to its board of directors and was required to follow commercial accounting principles and procedures. This unusual arrangement was intended to allow broad autonomy to hospital managers (to minimize the effects of government imperfections) while maintaining the government's ownership rights (to minimize the effects of market imperfections).

The tricky part of the reforms centered on promoting competition among hospitals without impairing access for those unable to pay. The government promoted competition by encouraging hospitals to attract unsubsidized A and B1 ward patients, because the surplus (revenues minus costs) generated from such patients could be retained. For the B2 and C ward patients, the government only pays for the gap between what patients were billed and what they actually paid. The objective of these unusual financing arrangements was to promote competition for full-fee-paying patients without undermining the incentive to treat subsidized patients. This strategy did not turn out as expected, as hospitals soon concentrated on for full-fee paying patients, and did not seek subsidized patients. To attract, full-fee-paying patients, hospitals purchased the latest equipment and technology and recruited highly regarded physicians by offering them higher salaries. These developments had the effect of raising prices at an even faster rate than had been the case before the reforms.

By the beginning of the 1990s broad recognition that the reforms were worsening the situation led to the establishment of the Ministerial Committee on Health Policy. The resulting white paper, published under the title *Affordable Healthcare* (Singapore 1993), bluntly noted: "Market forces alone will not suffice to hold down medical costs to the minimum." It went on to say: "In healthcare, supply tends to create its own demand, thus raising healthcare expenditure. The Government therefore needs to intervene to prevent an oversupply of services, to dampen unnecessary demand and ultimately, to control costs".

This publication marked the beginning of the second phase of reform. Its conclusion that "We need additional controls to keep hospitals efficient and to prevent cost inflation" (p. 35) accurately sums up the direction these reforms took during the 1990s. First, to

encourage public hospitals to concentrate on providing inpatient care to middle- and lower-income groups, the government limited the proportion of beds in A class wards in each hospital to 13 % of total capacity. Second, to further reduce the corporatized hospitals' revenue-maximizing tendencies, the Ministry of Health (MOH) imposed revenue caps in the form of set average cost per patient day for specific services. Third, to incentivize provision of services to subsidized patients, the government introduced a funding formula based on units of service actually provided instead of issuing block grants. Fourth, corporatized hospitals were required to seek MOH approval before acquisition of expensive technology and introduction of new clinical specialties. Fifth, while setting medical fees remained in the purview of the individual hospitals, MOH approval was required for large increases (Hanvoravongchai 2002).

The third phase of reforms began in the late 1990s as the government sought to consolidate and build upon its past reforms and to establish institutions and processes that promoted desired behavior on the part of hospital managers without detailed government intervention. The first measure in this direction was the decision in 1999 to cluster public hospitals into two groups. The intense competition among individual hospitals was now viewed as hindering planning and optimal deployment of resources. The large disparities in the size and reputation of different hospitals also made competition difficult for the smaller and more modestly equipped hospitals. To counter these obstacles, the government announced the creation of two similarly sized “clusters” of public hospitals and clinics to replace HCS: the National Healthcare Group (NHG) and the Singapore Health Group (SingHealth). This reorganization—along the lines of government intervention to correct market imperfections—was intended to promote economies of scale, effective coordination and planning of resources, better integration of inpatient and outpatient facilities, and a more effective patient referral system within each cluster.

NHG and SingHealth, still in existence today, are separate private companies owned entirely by Ministry of Health Holdings Private Limited, a holding company owned by the government. Similarly, each public hospital is a separate private company owned entirely by either NHG or SingHealth. Notwithstanding government ownership, NHG and SingHealth and their subsidiary hospitals are separate firms subject to the same company laws that apply to private firms. Legally, they enjoy operational autonomy in all areas, including recruitment, remuneration, purchase, and pricing of services. They also have substantial revenues and surplus from treating patients in nonsubsidized wards, which reinforces their autonomy. Yet the fact that the government remains the owner means that it can control and direct the hospitals, if necessary, in ways that would not be possible if they were truly private firms.

Another measure to improve service quality and to lower prices has been to increase the amount of information on hospital charges and clinical outcomes made available to customers. Since 2003, public hospitals have each been required to publish average bill size for various common conditions and procedures; the collated data are subsequently published on the MOH Web page (<http://www.moh.gov.sg/corp/charges/common/procedures.do>). There is evidence that the publication of such data has imposed downward pressure on prices (Wong et al. 2007).

By the mid-1990s, public hospitals had begun to operate largely in ways the government policies intended: fee increases became less frequent, proliferation of new specialties slowed down, and the number of subsidized beds expanded. Correspondingly, government subsidies as a share of total health care expenditures, which had declined rapidly in the late 1980s and reached 18 % of the total by 1992, began to creep up again and stabilized at 25 % by mid-decade (Massaro and Wong 1995). The economic recession that began in late

Table 4 Singapore's mix of policy instruments in health care

	Market mechanisms	Government interventions
Policy instruments	Financing: Out-of-pocket payment for health care provision Registering public hospitals as private firms Competition among providers, public and private Provider payment Fee for service for outpatient services and unsubsidized hospital wards	Financing: Medisave MediShield Medifund Transfers to hospitals Provision: Public ownership of vast majority of hospitals Strict supervision of hospitals Requirement to publicize average price of treating particular illnesses Provider payment Case mix and block grants for subsidized hospital care
Market or government imperfections requiring response	Inadequate information Rigidity Regulatory capture Unresponsiveness Lack of concern for costs Fiscal unsustainability	Information asymmetry Monopoly power of providers Lack of consumers' ability to assess service quality and compare price Unaffordability for households
Strengths	Sensitive to changes in demand and supply Technical efficiency Flexibility	Certainty Allocative efficiency

1997 increased the demand for lower-class hospital wards and, hence, the amount the government spent on health care subsidies.

Table 4 summarizes the policy mixes used to address health care challenges in Singapore, within the framework of the duality between market and government imperfections.

Discussion

The case studies described above provide evidence demonstrating the duality between market imperfections and government imperfections. In land transport, additional charges introduced by the government of Singapore in dealing with externalities were severely undermined by government imperfections such as information gap and strategic response, and the use of market mechanisms such as auction for COEs gave rise to concerns over equity, a typical market imperfection. In health care, corporatization of publicly owned hospitals as a solution to government imperfections subjected the system to a set of market imperfections due to ubiquity of market failures in health care, and the government subsidies of public hospitals raised concerns of inefficiency, a characteristic of health facilities

in the public sector. These inherent deficiencies of both market and government are commonly seen in other countries and other sectors.

The general success of innovative policy mixes introduced in the two sectors in Singapore to deal with both market imperfections and government imperfections simultaneously makes these mixes distinctive. In land transport, competitive bidding has been used to not only address information deficit in government interventions, but also to take advantage of strengths of market mechanisms; at the same time, measures such as setting high standards for the public transport system have been put in place to address shortcomings inherent to the use of market mechanisms. In health care, on the one hand, considerable government subsidies have been provided to government-owned hospitals to address market imperfections pervasive in the health sector, such as increasing user charges, and medical savings plans have been introduced to correct problems of government imperfections in health care.

Singapore's success in dealing with difficult challenges in the two sectors does not, however, imply that Singapore has achieved optimal policy mixes. Nor does it suggest that policy development in Singapore has been guided by the framework outlined above. In fact, the country's search for the proper policy mixes has gone through various iterations and stages, with ups and downs in the process. Government increased charges for vehicle use four times, from 25 to 175 % in ten years, before a policy change was made to confront shortcomings in traffic congestion policy more systematically. Similarly, policy mixes in Singapore's health care system have also evolved through several phases. The first phase lasted from the mid-1980s to early 1990s and concentrated on corporatizing public hospitals (which accounted for more than four-fifths of total hospital care) and promoting competition among them. The second phase started in the early 1990s and was characterized by reassertion of government direction over hospitals' operations, following the realization that competition had led to improvements in quality but also increased costs.

This pragmatism in policy making in Singapore is perhaps among the most important factors accounting for its sustained search for effective policy mixes. A unique feature of the country's political system is that a single party—People's Action Party (PAP)—has won elections since 1959, when the country gained independence. The resulting stability in political leadership implies that government can sustain its efforts in seeking innovative policy solutions over a long period of time. In comparison, incoming political leaders in many countries are often compelled to make drastic departures from the policy directions from their predecessors, a condition not conducive to consistent pursuit of effective policy mixes.

Concluding remarks

Coase (1964, 195) has stated that “until we realize that we are choosing between social arrangements that are more or less all failures, we are not likely to make much headway.” A framework illustrating duality between market and government imperfections has been presented here to promote better understanding of the inherent deficiencies of both market and government as sole authorities in policy design and analysis. By carefully counter-positioning the advantages offered by both sectors, policy mixes may overcome the limitations of both while accentuating their respective strengths. Markets and governments offer different opportunities and constraints to policy choice that are not always contradictory but, when used strategically, also can be complementary. The strengths of the two together are more than the sum of the parts.

Analysis above has suggested how policy mixes might become the norm of response to address intractable problems found in a range of policy sectors. In the two cases studied here, Singapore's successes in dealing with such problems resulted from combining seemingly unrelated or even contradictory market-based and government-based policy instruments in order to target the complex root causes of the problem.

The mere presence of an assortment of different policy instruments drawing from both sectors does not necessarily lead to the policy success. In many countries, for example, use of a variety of policy instruments might reflect compromises among different stakeholders to advance their own interests or represent difficulties in terminating policies instituted by prior governments when a new administration has come into power, with its own policy imperatives. In such circumstances, the policy mixes may become a source of tensions or conflicts that undermine policy effectiveness.

The framework presented above not only can help policy makers to distinguish among different policy mixes in terms of effectiveness, but it may also provide some useful guiding principles for policy design. First, due to duality between market and government imperfections, the adequacy of a policy mix depends on its effectiveness in addressing both kinds of imperfections simultaneously. Second, the efficacy of a potential policy instrument under consideration should be assessed in the context of the strengths and weaknesses of existing policy mixes that address market and government imperfections. Third, the concept of policy options can be broadened to compare not only different policy instruments, but also different combinations of policy instruments, that is, different policy mixes, as options in themselves. Last, optimal policy mixes may evolve over time as various factors underpinning their dual dynamic of market and government imperfections experience change.

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