

**Europe Sees Mixed Results From
Public-Private Partnerships For
Building And Managing Health
Care Facilities And Services**

Abstract

Prompted in part by constrained national budgets, European governments are increasingly partnering with the private sector to underwrite the costs of constructing and operating public hospitals and other health care facilities and delivering services. Through such public-private partnerships, governments hope to avoid up-front capital expenditure and to harness private-sector efficiencies, while private-sector partners aim for a return on investment. Our research indicates that to date, experience with these partnerships has been mixed. Early models of these partnerships - for example, in which a private firm builds a hospital and carries out building maintenance, which we term an "accommodation-only" model - arguably have not met expectations for achieving greater efficiencies at lower costs. Newer models described in this article offer greater opportunities for efficiency gains, but are administratively

harder to set up and manage. Given the shortages in public capital for new infrastructure, it seems likely that the attractiveness of these partnerships to European governments will grow.

The use of private finance for key public infrastructure projects, especially in transportation and utilities, grew almost fourfold globally from the early to the late 2000s.^(1,2) These partnerships have also been a growing part of health care infrastructure investment, particularly across Europe.⁽³⁻⁵⁾

Different variants of public-private partnerships have involved the use of private finance and for-profit organizations to design, finance, build, and maintain hospitals and other infrastructure, and occasionally to provide operational services. A typical project might be the reconstruction of an outdated public hospital by a private company and with private funding. In the United Kingdom alone there have been more than 100 such projects, ranging from a private finance commitment for US\$15 million for a small community hospital to more than US\$2 billion for the redevelopment of the Royal London and St Bartholomew's Hospitals in London.

In this article we discuss lessons for policy makers and health care providers from the use of public-private partnerships in Europe to develop and deliver health care infrastructure-- buildings, large technology systems, and associated services. We suggest that the continuing economic crisis, with its consequent fiscal constraints, is likely to stimulate European countries to increase the use of these partnerships.⁽⁶⁾

Major investment in Europe's health care infrastructure is needed, particularly in European Union countries and candidate countries with health infrastructure inherited from the former Soviet era. Typical of this situation is Slovakia, where an analysis indicates that hospitals are "unsatisfactory and old fashioned, which leads to their ineffective management."⁽⁷⁾ Similarly, Western European countries with more modern infrastructure need to redevelop hospitals as health care service models change and the need for inpatient beds declines.^(8,9)

The construction and maintenance of European health care facilities have generally been paid for by the state or by state-controlled entities. However, several European countries, such as France and Spain, have long experience of public-private partnership arrangements for major transportation infrastructure, and in recent years there has been an extension of these partnerships to health care (Exhibit 1). In 2010 health

care partnership deals worth US\$3.6 billion were signed, representing 16 percent of the value of all new public-private partnership contracts.⁽¹⁰⁾

Variety In Public-Private Partnership Models

The public-private partnership approach covers a wide range of models, from outsourcing to nearly full privatization. Broadly, it involves a "risk-sharing relationship between the public and private sectors with the objective of bringing about a desired public policy outcome."⁽⁴⁾ In essence, public-private partnerships are just another form of raising funds. In principle, the public-sector entity, such as a hospital or health authority, could borrow to undertake capital investment on its own account. In partnership arrangements, the private-sector partner is typically responsible for arranging financing. Either way, the reimbursement of the debt falls on the public purse.

Many combinations of public-private mix are possible for health care assets, with considerable diversity in the way risk management, financing, and payment mechanisms are structured (Exhibit 2). Partnership variants exist along a spectrum, determined by the degree to which various services and facilities are "bundled" within the contract.

At one end, an "accommodation-only" model embraces only the building and related services--for example, a hospital facility,

the associated "hard" facilities management (building maintenance), and sometimes "soft" facilities management (nonclinical services such as cleaning and catering). This accommodation-only model has been followed in the United Kingdom, where it is known as the Private Finance Initiative, and also in Italy, France, Spain, Portugal, Sweden, Canada, and Australia. The model largely takes the form of an integrated contract covering design, construction, and finance for the infrastructure and related services such as maintenance for the life of the building. The financial structure is based on long-term payments, typically over thirty years, by the public hospital authority to the private partner.

A second model, which is in effect an extension of the accommodation model, is used in Portugal. It involves twin "special purpose vehicles", or dedicated companies. One, dubbed the InfraCo, is responsible for development and management of the buildings, and the other, the ClinCo, is responsible for clinical services. The key contractual relationships are between the Ministry of Health, the hospital authority, and the InfraCo, with which there is a thirty-year contract, and the ClinCo, with which there is a seven- or ten-year contract.

A third model takes the form of a franchise issued to a private for-profit entity, but with strict control by a Ministry of Health or other public authority. The levels of financial

reimbursement for medical procedures received by a franchisee are the same as for public or other nonprofit hospitals also in the system. Furthermore, there is no "cream-skimming" of profitable patients; any member of the population must be accepted for any health care intervention offered by the hospital concerned.⁽⁴⁾

Germany, Finland, and other European countries are experimenting with this fourth model. In Germany, private companies--notably, Helios Kliniken and Rhön Klinikum--are buying financially stressed municipal hospitals and occasionally university hospitals and are running them under such a franchise from the regional states. Each of these companies partly or fully owns and manages more than fifty hospitals spread across Germany; other franchisees are smaller.

Finally, in a fifth model, public-private partnerships can involve full-service provision, in which a private company--via franchise--delivers both the hospital services and the primary care for a geographical area from its own facilities. The company can try to direct patients to whichever level of care--primary or secondary--is cheapest, with regulatory and payment mechanisms in place to maintain quality (see the example from Spain discussed below).

Advantages And Disadvantages Of Public-Private Partnerships

There is both support for and substantial criticism of the use of these partnerships in health care. Exhibit 3 summarizes the generally recognized advantages and disadvantages.

Potential benefits are said to include the ability to allow health care providers to concentrate on clinical services, instead of managing infrastructure, and increased efficiency in project delivery. For both governments and health care organizations, public-private partnerships also are seen as a potential solution for funding shortages due to budget constraints or other factors.

There are, however, concerns. One of these is the possibility that public-private partnerships may restrict competitive behavior. Even in large countries with an active public-private partnership market, projects can be so large that only a few organizations may be able to bid for them and manage subsequent service delivery over extended periods of time. Transaction costs are high during setup and the operational life of the facility, which only a few organizations are able to bear.

Another concern is possible lack of integration between the clinical models of care and the infrastructure and equipment that should support the clinical models, making it hard to align incentives between the parties involved to achieve high performance.

The United Kingdom's version of public-private partnerships--the Private Finance Initiative--is the classic example of an "accommodation-only" model, providing the buildings, perhaps some medical equipment, and the long-term maintenance of the financed items. It has been criticized on both the counts above, as well as over the high cost of the debt incurred when compared to government borrowing or bond issues.^(11,12)

Although there have been well-publicized public-private partnership failures, such as the Latrobe Regional Hospital in Australia, no public-private partnership hospitals have become bankrupt so far in Europe because of problems faced by health care organizations in servicing the debt.⁽¹³⁾ However, several of the United Kingdom's Private Finance Initiative hospitals are currently reporting serious financial stress.⁽¹⁴⁾

Lessons From Public-Private Partnerships Experience

Most of the more extensive public-private partnership models, such as those in Spain, Finland and Germany, are too recent for detailed longer-term evaluation . However, the UK experience of accommodation-only partnerships, covering buildings and related services, provides pointers to discuss performance in four broad areas: modernizing and creating health care infrastructure; improving the efficiency and quality of

care; sharing risk to stimulate innovation and performance improvement; and stimulating innovation.⁽¹⁵⁾

Modernizing And Creating Infrastructure

The United Kingdom initiated the trend toward use of public-private partnerships in health care. The Private Finance Initiative, established in the mid 1990s in health care, was partly about modernizing outmoded hospital facilities more quickly than would have been feasible under conventional public funding and procurement models. Between 1997 and 2009, 101 of 135 new hospital projects were completed under the Private Finance Initiative,⁽¹²⁾ driven in part by a lack of alternative sources of funding but also by an overt political decision in favor of the model irrespective of whether other choices were workable.⁽¹⁶⁾

Other examples of using public-private partnerships to modernize health care infrastructure come from Italy, France, Spain, and Portugal, where such arrangements have been used to construct major hospitals. Similarly, Central European and post-Soviet states have major hospital infrastructure renewal plans, although so far no big realized projects.

Romania has experimented with small schemes for radiology and imaging⁽³⁾ and for dialysis clinics.⁽¹⁷⁾ The Czech government has indicated its interest in public-private partnerships for

hospital services.^(18,19) Poland has agreed to the first of several public-private partnership health care schemes.⁽²⁰⁾

The largest health care infrastructure program by far is in Russia, where it is claimed that about \$380 billion will be invested between 2010 and 2020.⁽²¹⁾ The private sector is expected to contribute most of the financing, and several public-private partnership hospitals are currently in the preparation stage,⁽²²⁾ although the program has also faced legal problems.⁽²³⁾

Improving Efficiency And Quality Of Care

Proponents of public-private partnerships argue that the use of such partnerships raises the efficiency and quality of infrastructure delivery because payments can be linked to performance or achievement of quality targets. Governments often claim that public-private partnerships will secure better value for money than traditional public procurement options can achieve.

The UK experience is instructive. There is evidence that most Private Finance Initiative hospitals were completed close to on time, on budget, and meeting all specifications.⁽²⁴⁾ However, these conclusions must be interpreted with care, since the comparison is usually made for costs incurred only after contract signature--a stage at which such costs will probably have been identified. In the case of the Private Finance

Initiative, this stage is, on average, later than for public projects because of the lengthy time involved in project development and negotiation.

Another inquiry concluded that project construction and quality are not unambiguously better under the Private Finance Initiative.⁽¹²⁾ Others have argued that "soft" facilities management, such as for ancillary services like cleaning and catering, provides lower value for money than in non-Private Finance Initiative hospitals.⁽¹¹⁾ Around 20 percent of hospital trusts were dissatisfied with the maintenance services provided within their Private Finance Initiative contracts.⁽¹⁶⁾ On balance, evidence that the UK program has delivered timely projects with high quality and low operating costs is, at best, ambiguous.

Portugal's public-private partnership program--the second-largest relative to the size of a country's health sector--was stimulated in part by concerns about below-standard performance and cost overruns in public hospitals procured under traditional contracts. The government wished to introduce competing clinical providers and new procurement models, and it believed that operational efficiency gains from public-private partnerships would subsequently spread to other hospitals.

Between 2004 and 2008 four new partnership hospital projects were launched, which included private delivery of clinical services in addition to construction and management of

the buildings.⁽²⁵⁾ However, the complexity of these contracts and a lack of interest by banks in taking clinical performance risk led the government to revert to a UK-style accommodation-only model for the "second wave" of partnerships initiated in 2008.⁽²⁶⁾

Although there is confidence in Portugal that the new hospitals will generate efficiency savings, this remains to be demonstrated since a full post-construction audit has not yet taken place.

Risk Sharing

A fundamental principle behind public-private partnerships is that risk is allocated efficiently between private and public organizations. Risk should be allocated to the party that is best able to control it, or that requires the minimum risk premium. This, in theory, should drive innovation to achieve cost efficiencies and greater certainty of success, because the parties bearing the risk have an incentive to manage it more efficiently.

The private-sector partner needs to manage the risk whether it concerns construction or operation. "Bundling" together the infrastructure and future maintenance should theoretically give the main contractor incentives to deliver reduced whole-life costing and performance improvements. Put simply, the contractor will carry the responsibility for the facility, not just on handover to a client but for decades beyond.

Under public-private partnerships, some operational risks that traditionally rest with the hospital--those relating to inflation in maintenance and operational costs--are transferred to the private consortium. But major risks arising from technical obsolescence, changing regulations or policies, and unidentified future health care needs--such as falling or shifting clinical demand--generally remain with the public hospital authorities.

The widespread criticisms of the experience of risk allocation under the UK Private Finance Initiative are important, given that the majority of European public-private partnerships have been developed using the UK model as a template. This model has been widely evaluated and is said to have failed to achieve good value for money from risk transfer to the private sector.⁽¹²⁾ In other words, public-sector organizations pay a significant premium for the contractually stipulated risk transfer to the private sector, but still ultimately bear health project risks if the private-sector company is unable to deliver the project.

What the UK experience exposes is that building health care infrastructure inevitably involves risks. Public-private partnerships may help ensure whole-life cost control, because this is usually contractible and can largely be captured by the private-sector partner. However, there is a trade-off against

quality and flexibility--crucially important for hospitals as health care practice evolves, but much harder to specify in the contract.

What's more, although the potential alignment of incentives between the parties to deliver improved performance may well be greater in public-private partnership models that embrace buildings and nonclinical and clinical services, this alignment is at the expense of increased contractual and financial complexity.⁽²⁷⁾

Stimulating Innovation

Finally, the United Kingdom's Private Finance Initiative program suggests that innovation in design and construction has not been encouraged. When the program was developed, it was emphasized that the need for whole-life costing would stimulate innovation in buildings. However, research on early Private Finance Initiative hospital projects suggests that the model failed to achieve this result.⁽¹⁵⁾

First, because design was carried out concurrently with contract bidding, open discussion of new ideas was constrained by the consortium's fear that it might lose the project in the next phase of the process of bidding for the project. Second, final risk allocation occurred too early in the bidding process, limiting the opportunities for innovative thinking as the

project unfolded. In the circumstances, contractors played safe and offered designs that they could guarantee to deliver.

Future Directions In European Health Care Public-Private Partnerships

Funding

Future development of health care public-private partnerships in Europe will be shaped both by the effects of the immediate financial exigencies and by longer-term challenges in meeting future health and social needs. The public expenditure squeeze may motivate governments to choose a private financing route for health care capital investment and selected medical services.

Currently, funding anywhere in Western countries for major infrastructure projects is proving expensive and hard to obtain. Banks are increasingly risk averse and are seeking higher margins to cover themselves.⁽²⁸⁾ In the longer term, though, public-private partnerships are fundamentally an attractive market for investing institutions, especially pension funds. A prolonged economic downturn could provide investors with greater incentives to participate, to secure predictable income from the rising and relatively stable demand for health care.⁽²⁹⁾

Rising public pension costs in aging societies provide another possible indirect stimulus to the development of public-private partnership structures, this time from the perspective

of the desirability of creating financial assets. Governments, concerned with looming entitlements, may have little choice but to try to pass on more of their pension, and possibly some health care, commitments to households to purchase and manage personal assets through increased private saving.

The financial institutions serving the household sector, particularly pension funds, will need assets to match these increased liabilities over the long term, and many of these income-generating capital investments could be public-private partnerships. Health care capital investment, providing a relatively stable if limited return, could well be part of the mix of these assets--and conveniently one that to some extent is correlated to the services being demanded.

Developing New Care Models

Another factor influencing the future of European health care public-private partnerships is the extent to which governments see them as a way of solving broader problems in care delivery. One report suggests that the partnerships will increasingly move from "replacing crumbling inpatient structures to managing care delivery."⁽³⁰⁾ This shift will require the delivery of flexible infrastructure that is more closely linked to health care services and outcomes. Greater sophistication may therefore be needed in the design of public-private

partnerships, particularly where the boundaries around which services are included within the contract's scope are drawn.

The more extensive public-private partnership models appear to be pointing the way. An example is Coxa Hospital, in Tampere, Finland, where existing elective orthopedic services have been consolidated into a new hospital.⁽⁹⁾ The public-private partnership involves a private company with yearly contracts, via the local university hospital, from municipalities, which are responsible for purchasing health care in Finland.

The arrangement embraces both physical infrastructure and clinical services, in the form of surgical replacement of upper and lower limb joints. Significant process and safety improvements are said to have resulted--notably, reduced time to prepare operating theaters, significantly lower infection rates, shorter lengths-of-stay in hospital, and less readmission for revisions of operations.⁽³¹⁾

The partnership was funded mostly by project finance debt and is now making modest profit distributions to the public-sector owners of the equity in the project.⁽³¹⁾ The local health planning district is now looking at introducing this model for other clinical-specific facilities, including cardiology and ophthalmology, with new "focus hospitals" sharing common services with the university hospital.

Another example, extending the idea of bundling services even beyond the hospital, is that of Ribera Salud, in the Valencia region in Spain.⁽⁹⁾ Initially, a consortium in the Alzira local area health department built a hospital only, but it faced insufficient income to cover costs, as a result of overly optimistic pricing to win the contract and underestimated cost inflation. The consortium was obliged to renegotiate its contract with the Valencia region health authority, and the scope of the partnership was extended from purely hospital care to a full primary and secondary care service.

The current, renegotiated model of the principal company involved (Ribera Salud) has been rolled out to other health departments of the region. It is innovative in several ways. Payments use a "capitation" model in which the regional health authority makes a standard payment for each member of the population in a single local area forming a defined catchment area. The payments are set so that the cost to the public purse is lower than that previously incurred under purely public-sector provision or in other comparable areas. Furthermore, the terms of the contract discourage the consortium from reducing the volume or quality of health care services provided to its catchment population, since costs incurred by patients traveling outside the concession are charged to the hospital company, and there are disincentives to offering care to non-catchment

citizens. An initial review of the health care outcomes shows impressive results in a range of indicators such as significantly reduced delays in waiting for surgery and MRI / CAT scans, reduced average hospital stays, lower readmission rates, and increased rates of day and outpatient surgery.⁽³²⁾

Despite the apparent successes in these examples, the extension of public-private partnerships into a wider range of services beyond the infrastructure is by no means straightforward, because of the two trade-offs mentioned above.

The first is alignment of incentives against complexity: Managing a myriad of relationships across private and public boundaries and over extended periods in extensive models is administratively demanding. The second is cost against quality: Identifying *ex ante*, and monitoring *ex post*, the level of quality that partnership parties are required to achieve in performing their contractual obligations is difficult when "quality" is noncontractible and hard to observe.

Payment Systems

Ensuring that public-private partnerships deliver what they promise requires thought on how their payment systems should be designed. There are major differences between direct payment models for the infrastructure alone, focusing on the availability of facilities and performance in delivering facilities management (for example, the United Kingdom's Private

Finance Initiative program), and indirect payment models such as the capitation approach deployed in Ribera Salud in Spain-- somewhat similar to a US accountable care organization, but under tight state regulation. Here, with money following the patient throughout, patients have more freedom to choose their preferred provider with the highest service and care standards, thus giving the health care organization incentives to deliver the highest performance.

Conclusion

We have argued in this article that public-private partnerships in health care are only peripherally about perceived private-sector efficiencies, easier finance, or the removal of expenditure from national balance sheets. They are, or at least should be, much more about ensuring that risks arising from the development and operation of health care infrastructure are optimally allocated between public and private partners, thereby reducing the risk premium. Bundling activities and using the payment mechanism to create incentives for high performance by the different contractual parties is one theoretical way of achieving this result.

Until now, public-private partnership arrangements have been most successfully realized in those utility sectors in which service quality can be clearly specified, measured, and guaranteed. But this is challenging in health care, where

outcomes are harder to measure and public-interest objectives can clash with the cost-saving behavior of a private party.

The partnership examples in health care that have bundled infrastructure, nonclinical and clinical services hint at promising health care and economic outcomes. However, lessons need to be translated into a more refined understanding of how best to achieve this result by creating incentive and risk management mechanisms acceptable to all parties, given that extending the partnerships within a project to include clinical services adds an additional layer of complexity.

Public-private partnerships will not always be the best option--the risk of being locked into an inefficiently designed contractual arrangement is high. But they remain very much a prominent feature of health care discourse in Europe. The European Commission promotes the use of the public-private partnership instrument across many sectors, and the developing concept of "European Project Bonds" is compatible with this approach. A more robust understanding of their limits and possibilities is therefore vital.

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In this month's *Health Affairs*, James Barlow and coauthors assess the public-private partnerships that European governments have increasingly turned to for financing, constructing and

operating public hospitals and other health care facilities and for providing services. The experience, they write, has been mixed, with some models falling short of expectations for achieving greater efficiencies at lower costs, while others hold greater potential for achieving these ends. They predict that these partnerships will grow in number as European governments continue to face budgetary constraints.

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Exhibit list:

Exhibit 1 (table)

Caption: Location And Features Of Public-Private Partnerships For Health Care Project Financing In Selected European Countries

Source/notes: SOURCES Adapted from Barlow J, Roehrich J, Wright S. De facto privatization or a renewed role for the EU? Paying for Europe's healthcare infrastructure in a recession. J R Soc Med. 2010;103:51-5. Some figures are based on Survey of Project Finance in Healthcare sector, Finlombarda, 2009 May. NOTE PPP is public-private partnership. [Author: What does * denote?]

Exhibit 2 (table)

Caption: Models Of Public-Private Partnership Structures In Hospital Construction And Other Health Facilities

Source/notes: SOURCE Authors' analysis. NOTES PFI is Private Finance Initiative in the United Kingdom. Portugal Wave 1 schemes (prior to 2008) were more all-embracing, including infrastructure and clinical services; Wave 2 schemes were less innovative and simpler, as they only included the construction and operation of facilities and ancillary services. [please explain--not in text].

Exhibit 3 (table)

Caption: Advantages And Disadvantages Of Public-Private Partnerships

Source/notes: SOURCE Authors' analysis. NOTES Some exemplar references are in the Notes in text. Others are in the online Appendix. To access the Appendix, click on the Appendix link in the box to the right of the article online. In column 1, a plus sign denotes an advantage, and a minus sign denotes a disadvantage.

EXHIBITS

Exhibit 1: Location And Features Of Public-Private Partnerships For Health Care Project Financing In Selected European Countries

Country	Predominant health care finance source	Role of private capital in infrastructure and services provision	Number of PPPs	Value of PPPs
Finland	Tax	Experimenting with buildings/maintenance and clinical partnerships	1	<\$100 million
France	Social health insurance	Some buildings/maintenance partnerships	16	\$1.6 billion
Germany	Social health insurance	Growth in for-profit provision under state concession; mostly state grants for capital expenditure; partnership experiments	24	\$2.1 billion
Italy	Tax	Small private sector; some buildings/maintenance partnerships	71	\$5.7 billion
Poland	Social health insurance	Buildings/maintenance partnerships	1	\$40 million
Portugal	Tax	Buildings/maintenance and clinical partnerships; now buildings/maintenance only	8	\$4.6 billion
Spain	Tax	Some buildings/maintenance partnerships and "full-service" partnerships	19	\$2.3 billion
Sweden	Tax	One major contract under construction	1	\$2.1 billion
United Kingdom	Tax	Small private elective sector; major buildings/maintenance program	146	\$25.8 billion

SOURCES Adapted from Barlow J, Roehrich J, Wright S. De facto privatization or a renewed role for the EU? Paying for Europe's healthcare infrastructure in a recession. *J R Soc Med.* 2010;103:51-5. Some figures are based on Survey of Project Finance in Healthcare sector, Finlombarda, 2009 May. NOTE PPP is public-private partnership. [Author: What does * denote?]

Exhibit 2: Models Of Public-Private Partnership Structures In Hospital Construction And Other Health Facilities

Model	Brief description
“Public-public partnership” (example: certain Spanish projects)	A special-purpose publicly owned company, largely financed by limited-recourse commercial debt, has responsibility to deliver facilities, with the state continuing to provide medical services
Accommodation-only: often via “design, build, finance, operate” (DBFO) or “build, own, operate, transfer” (BOOT) schemes (examples: UK’s PFI; also used in France, Spain, Portugal Wave 2, Italy, Sweden, Australia, and elsewhere)	A private consortium designs, builds and operates infrastructure facilities based on a public authority’s specified requirements, often as an output rather than input specification In the DBFO model, the private sector also finances the facility, typically via high “gearing” (proportions of debt); the limited amounts of equity can include the public sector, with mechanisms to control any conflicts of interest; the public authority purchases services for a fixed period, after which ownership reverts to the public authority
Twin accommodation/clinical services joint venture (example: Portugal Wave 1)	The infrastructure element is like an accommodation-only model A clinical services company with different, shorter-term financing provides medical services and has a contractual and shareholding relationship to the asset provider
Franchising (example: German private hospital companies)	A public authority licenses a private company to develop (finance, build, and manage, inclusive of medical services) a replacement for a public hospital
“Full-service public-private partnerships” (example: Ribera Salud, Spain)	A private contractor builds and operates a hospital and some or all of the area’s associated community primary care provision, with a contract to provide care for a defined population

SOURCE Authors’ analysis. NOTES PFI is Private Finance Initiative in the United Kingdom. Portugal Wave 1 and Wave 2 denote [please explain--not in text].

Exhibit 3: Advantages And Disadvantages Of Public-Private Partnerships

Advantages and disadvantages	Brief description	Exemplar references
Solution for public-sector capital shortage (+)	Public-private partnership arrangements may deliver an asset that might be difficult to finance	National Audit Office (Note 25 in text); Broadbent and Laughlin (Appendix)
Reduces cost of capital (+) or higher capital costs (-)	Mixed results from prior studies	Liebe and Pollock (Note 12 in text); National Audit Office (Note 25 in text); Ball et al. (Appendix); Gaffney et al. 1999a (Appendix); Gaffney et al. 1999b (Appendix)
Health care providers can concentrate on clinical services (+)	Nonclinical services (such as maintenance and security) are left with the private contractor	Finlayson (Appendix)
Introducing private-sector efficiency (+)	Project delivery on time and on budget; most contracts are fixed price; ongoing maintenance and transparent life-cycle costs	Finlayson (Appendix); Hodgson et al. (Appendix); Flinders (Appendix)
Adoption of new technology and management (+) or stifling of innovation (-)	Incentivizing performance by specifying service levels; innovation and good design through output specifications	Barlow and Köberle-Gaiser (Note 16 in text); National Audit Office (Note 25 in text)
Higher transaction, monitoring and set-up costs (-)	Complex, long-term contracts and inter-organizational relationships need to be set up and managed; reduced contract flexibility as contracts are difficult to change and monitor	Lonsdale (Appendix); Dixon et al. (Appendix); Entwistle et al. (Appendix); Pollock et al. (Appendix)
Lack of integration between clinical models and infrastructure design (-)	Responsibility for infrastructure and clinical services mostly not provided by one organization so important to align incentives	Barlow and Köberle-Gaiser (Note 16 in text)
Difficult relationship management over extended periods of time (-)	Need to manage a wide network (including banks, suppliers, consultants) over time periods of up to 30 years	Barlow and Köberle-Gaiser (Note 16 in text); Domberger et al. (Appendix); Zheng et al. (Appendix)
Risk allocation (+/-)	Allocation of risks to party best able to manage them; ultimate risk lies with public sector; increased commercial risks due to long-term and high contract value	National Audit Office (Note 25 in text); Ball et al. (Appendix); Bing et al. (Appendix); Deloitte (Appendix)

SOURCE Authors' analysis. NOTES Full citations for exemplar references are in the Notes in text or in the online Appendix. To access the Appendix, click on the Appendix link in the box to the right of the article online. In column 1, a plus sign denotes an advantage, and a minus sign denotes a disadvantage.

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