

NBER WORKING PAPER SERIES

THE COMPLEMENTARITY BETWEEN CITIES AND STATE CAPACITY

Edward L. Glaeser

Working Paper 33247

<http://www.nber.org/papers/w33247>

NATIONAL BUREAU OF ECONOMIC RESEARCH

1050 Massachusetts Avenue

Cambridge, MA 02138

December 2024

The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

The author has disclosed additional relationships of potential relevance for this research. Further information is available online at <http://www.nber.org/papers/w33247>

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2024 by Edward L. Glaeser. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

The Complementarity Between Cities and State Capacity
Edward L. Glaeser
NBER Working Paper No. 33247
December 2024
JEL No. O17, P14, R50

ABSTRACT

Public capacity complements urban density because externalities abound in cities and urban scale makes it possible to share infrastructure that needs to be managed. Yet, urban governments face limitations that are not experienced by private sector entities. A city cannot just stop policing if it decides it is bad at policing. Typically, public compensation and personnel policies are highly regulated either by law or by union contracts. City governments do, however, have one great advantage over private entities: a greater ability to learn from their peers. City governments do similar things throughout the world, while companies frequently specialize. Private companies have strong incentives to hide the trade secrets that make them more productive, cities do not. As individual cities do not have an incentive to make it easier for other governments to learn from them, multinational entities like the Asian Development Bank and the World Bank could enable that learning. Since climate-change-related crises are relatively rare events, city-to-city learning seems particularly important for adapting to climate change.

Edward L. Glaeser
Department of Economics
315A Littauer Center
Harvard University
Cambridge, MA 02138
and NBER
eglaeser@harvard.edu

I. Introduction

Urban density and public capacity are complements. Cities are rife with externalities, such as traffic congestion and contagious disease associated with human waste. Urban scale enables vast infrastructure investments, including walls that protect against invaders or the sea, and public transit systems. Effective governments make city life far more pleasant and safe by managing externalities with policies like congestion pricing and providing infrastructure efficiently, often with the partnership of private entities. Yet too often, urban governments either fail to address the downsides of density or do so at a prohibitive cost.

What limits the efficacy of city governments?¹ City governments are typically far more constrained than private sector entities, both in the activities they must pursue and in the way they pursue those activities. Companies routinely close unprofitable divisions, but New York City cannot just get out of the schooling business if it decides that it is bad at providing educational services. Firms rely on personnel practices to select and motivate their workers, but most cities can neither fire underperforming teachers nor institute strong incentives linking pay with performance.² City governments must face dauntingly difficult challenges, typically with remarkably little flexibility.

One central advantage that city governments have relative to private sector entities is that it should be far easier to learn from other city governments than it is to learn from other companies. There are thousands of city governments throughout the world. Many of them undertake similar tasks with similar tools. Companies typically specialize. Moreover, since firms compete with one another, they have strong incentives not to share their production techniques. While cities compete in certain settings, such as attracting an Amazon headquarters or an Olympic Games, there is no harm done to Frankfurt if Paris' policing becomes more effective. Yet while the opportunities for city-to-city learning are large, the actual amount of that learning is limited. While cities do not have strong incentives to hide information, they do not have strong incentives to share that

¹ As I discuss later, I use the term “city government” to mean the public actors that are responsible for core urban functions, such as managing public spaces, regulating the built environment, and providing transportation services. These functions may be consolidated into a single local government or may be part of a regional or even national government.

² Hart, Shleifer, and Vishny's (1997) model of the “proper scope of government” sees those constraints as a comparative advantage of government because a “non-distribution constraint” lowers the incentive for quality-reducing cost cuts. Yet, from the perspective of a city leader, the constraints are more of a challenge than an opportunity.

information either. Moreover, the same rules that control public sector personnel practices make it difficult for city governments to hire sophisticated knowledge workers, whose sole task is to investigate the successes and failures of other urban governments throughout the world. The possible upside from city-to-city learning suggests that global development entities—including the Asian Development Bank, the Inter-American Development Bank, and the World Bank—could significantly improve the quality of urban government throughout the world by acting as conduits of “city-craft.”

The upside of learning is particularly clear with activities that occur infrequently in any city but that are common across cities, such as infrastructure provision and dealing with climate-change-related disasters. Cities typically have little opportunity to experiment in infrastructure provision because they are regulated by higher levels of government and because the stakes are high. Yet, there are natural experiments in infrastructure provision throughout the world that can enable government-to-government learning if the data were more widely available.³ Global development entities that fund infrastructure themselves would seem to be particularly well positioned to serve as data providers in ways that can improve infrastructure provision and cost.

Section II of this paper highlights the complementarity between cities and the public sector, with a focus on Asia’s urban history. There are more city-dwellers in Asia than in the rest of the world put together, and the diversity of Asian cities is enormous (UN Habitat 2022). Not only wealth, but the overall capacity of the public sector divides cities like Seoul and Singapore from cities like Kabul and Yangon, and the quality of life in a dense urban environment depends on effective government. The public sector can reduce the downsides of density, such as traffic congestion and contagious disease, by regulating harmful behavior. The public sector can also invest in the shared infrastructure, from ports to museums, that empowers urban lives.

This section deals with the history of regulating urban externalities, the challenge of urban enforcement, and urban infrastructure. The oldest known legal codes emerged in Asian cities 4,000 years ago. These codes attempted mainly to reduce harmful interactions between people; but some, such as the Code of Hammurabi, went further and regulated commercial transactions, such as construction projects. The light regulation of ultra-dense Asian slums meant that they were

³ The consulting industry provides one way in which knowledge can spread across governments and companies, and there is a robust infrastructure consulting profession. While individual experts can often provide great insight (see, for example, Flyvberg and Gardner, 2023), this is not a substitute for a widely available body of knowledge about how to build infrastructure cheaply and well.

particularly vulnerable to the coronavirus disease (COVID-19), yet Asia's best performing cities were objects of global envy throughout the pandemic (Malani et al. 2021). Effective governments can mediate adverse urban externalities and manage shared urban infrastructure. Urban density can also make it easier to monitor government performance (Campante and Do 2014).

In section III, I turn to the similarities and differences between city governments and private firms. This section defines city governments as governmental entities that perform urban services including (i) managing transportation systems, (ii) providing water and reducing waste, and (iii) policing local streets. In some cases, these services are directly handled by a locally elected government, while in other settings, a regional or national government may deliver the service. Private providers are also sometimes used.

This section highlights two classes of constraints that limit city governments: (i) regulation of operation and (ii) regulation of service. Regulation of operation includes the limitations on procurement, hiring, and firing that often bind city governments. Regulation of service specifies what services the government must provide (e.g., policing within its borders) and what it must not provide (e.g., policing somewhere else). The first class of regulation limits the efficiency of any particularly governmental service. The second class of regulation limits the efficiency of the system as a whole, since (unlike in the private sector) more effective service providers rarely take over the territory of less effective service providers.

The great offsetting advantage of city governments is the ability to learn from other places. In principle, the fact that there are thousands of public entities trying to do the same thing in similar settings should create an enormous body of knowledge that should rapidly improve public sector quality. Yet, there is little evidence that city governments are converging on global best practices across a wide range of services. In some cases, the constraints that city governments face make such learning impossible. In other cases, we just do not have the requisite body of knowledge.

Section III also focuses on areas of overlap between government and private enterprise: public-private partnerships (PPPs) and public procurement. There are some limitations in the public sector, such as rules regarding compensation, that can be sidestepped by turning to a private provider. But as Engel, Fischer, and Galovic (2014) found, PPPs often go awry. The combination of a lightly regulated entity facing strong incentives to extract resources and a relatively weak public sector is fraught. Public procurement is another so central way in which the public sector

interacts with the private sector, and it is also an area in which international entities could help city governments learn.

Section IV then concludes by discussing learning and climate change. The cities of the developing world are disproportionately at risk from climate change because many of them face risks from both flooding and heat. Many of Asia's cities are particularly threatened. The costs of ignorance are particularly large in this area, especially given the perils of climate-related disasters. Building the public capacity to respond to crises could save thousands, if not millions, of lives. Learning about crisis response is relatively straightforward, since the connection between action and impact is often quite clear. Learning about the efficiency of precrisis investments, such as elevating roads to reduce flooding risk, is more challenging.

II. The Complementarity Between Cities and Government

The messy complexity of urban life creates tremendous scope for positive and negative interactions. The public sector can enhance the range of positive interactions by creating conditions where people can trust one another (Ashraf, Delfino, and Glaeser 2019). The harmful externalities that can occur readily when people are near one another can be managed through torts, regulation, and the criminal code. These externalities can also be handled by infrastructure, although infrastructure itself can sometimes provide more benefits when it is paired with appropriate incentives that encourage or discourage use.

In this section, I begin by examining three ways of handling the externalities associated with urban animals: a Japanese social norm, the common law tort system, and modern regulation. I then turn to a brief discussion of the management of the policing that is needed to enforce urban laws. I end by discussing urban infrastructure, which also typically requires some public management, even if it is provided by private entities.

A. Regulating Urban Externalities

Cities are defined by their density level, and the proximity of people and animals leads to externalities. Traffic congestion, contagious disease, and criminal activity can all increase in more

crowded environments. Externalities abound in cities because of proximity. For example, my action is more likely to impact your well-being if we are 3 feet apart than if we are 300 feet apart. Abundant space allows waste to decompose safely and makes it easier to drill wells for clean water. Density makes it more likely that human beings will infect each other, either directly through airborne illnesses, like COVID-19, or indirectly by infecting the water supply, as in the case of cholera. [OBJ]

Cities also enable the sharing of natural and man-made assets, including parks, roads, and watersheds. Typically, these assets are not public goods, because one person's use can reduce the benefit received by another user. Consequently, if these goods are unpriced or unprotected, they can be another major source of urban externalities. Famously, Dr. John Snow discovered the water-borne source of cholera by tracing its source to a public well on London's Broad Street, which had been infected by a discarded children's nappy.

The management of urban space involves two distinct tasks: (i) determining the set of regulated and unregulated activities, and (ii) determining the penalties and enforcement mechanisms that impact those engaging in the regulated activities. Penalties can be either fixed or assessed ex post, and enforcement can be done by police or health inspectors, or by private citizens that have access to courts. These choices of penalty structure and enforcement mechanism can depend on the risks of corruption and subversion. In late 19th century New York City, enforcement of health-related rules was taken away from the police department partially because of fears about corruption. Behrer et al. (2021) argue that fixed penalties are less subject to subversion than assessed ex post penalties; consequently, fixed penalties become more appealing in weak legal regimes.

Both the set of regulated activities and the penalties applied to those activities can differ across space within a city. For example, classic Euclidean zoning can often mean that manufacturing is allowed in some areas of a city and not others. Many cities traditionally had "red light districts," which permitted a larger range of nocturnal pastimes, either by law or by custom, with the typically paid acquiescence of the local police.

In this section, I focus on the ancient urban externalities associated with urban animals. These externalities have often been addressed with place-specific rules. I start with two traditional Asian strategies that limited the harm from urban waste without public involvement. I then discuss

a co-Asian approach to urban waste with courts in England. I end by discussing the regulations of animals in 19th century America.

The waste associated with urban animals (including humans) produces particularly noxious negative externalities and potentially spreads disease. Cholera, in particular, is typically transmitted from feces to mouth. Yet, while waste creates negative externalities if left unattended, it can also have positive value as a fertilizer. Asian cities, including those of both the People's Republic of China (PRC) and Japan, famously sold their excrement, known as “night soil,” to farmers. While this generated both cleaner streets and more fertile farms, the close contact with excrement that traditional night soil gathering requires created its own health risks. High population densities in agricultural areas made the demand for fertilizer particularly robust in 17th and 18th century Japan, which generated sizable returns for night soil collection (Szczygiel 2023).

This ingenious system requires fertilizer prices to be reasonably high and human labor to be relatively cheap, and by 1930, competition from chemical fertilizers led to a breakdown in Japan's night soil industry (Noda 2024). Japan's government responded by regulating human waste, which suggests that even a negative urban externality can be turned into a profit opportunity. Addressing harmful behavior often requires regulation, taxation, the action of the court system or the presence of an effective social norm.

Religions can also create norms that reduce harmful urban externalities. In pre-modern Japan and India, contact with dead animals was understood to be polluting. The Tendai School, a form of Mahayana Buddhism, became one of the more successful Buddhist traditions in Japan from the 9th century onward. Chapter 14 of the *Lotus Sutra*, a seminal text in Mahayana Buddhism, describes appropriate behavior for a would-be “bodhisattva or mahāsattva,” which includes not being “closely associated,” with “persons engaged in raising, pigs, sheep, chickens or dogs.” The Sutra later says that “he must not associate with slaughterers or flesh-carvers, those who hunt animals or catch fish, or kill or do harm for profit” and “those who peddle meat for a living (Watson 1993).” Maimonides claimed that there were pragmatic health-related justifications for Jewish dietary and animal-related rules (Maimonides 1956). It is equally plausible that these Buddhist injunctions also had some connection to health-related concerns.

These rules became something of an urban health code in medieval Japan, as butchers and hog farmers were banished to the urban periphery. These rules did not end until the Meiji Restoration, and after that point, Japan increasingly followed a Western model of regulation and

litigation. A spatial ban on animal slaughter in the city center defined the regulated activity and space of regulation. The enforcement presumably worked through community approbation of any violators of that ban. While this ban presumably limited the health consequences of human contact with animals in cities, it also imposed large costs on the banished butchers and ensured that urbanites had to travel to buy their meat.

In Common Law countries, litigation typically came before regulation (Glaeser and Shleifer 2006). In 1610, an English landowner, William Aldred, brought a lawsuit against his neighbor, Thomas Benton. Aldred was seeking legal redress because Benton had built a hog sty next door and the fumes from the sty were “stopping the wholesome air” from his own home. While it was not until the mid-19th century that the germ theory of illness was properly understood, centuries before that, it was thought that proximity to a large number of pigs was unhealthy and certainly unpleasant.

The court found in Aldred’s favor but distinguished between “wholesome air” and “light,” which were “necessary,” and views or “prospect,” which is “a matter only of delight.” The law would punish neighbors who took away “necessities” but not “delights,” which effectively limited the use of Common Law to regulate purely visual externalities. No court in England would have deprived a farmer in a low-density dwelling of his right to keep animals, but the impact of hogs was larger in a dense setting and, consequently, the public sector intervened (Glaeser and Shleifer 2006). In line with English political traditions and the Coase Theorem, this externality was addressed by private legal action and handled by the judicial sector.

Yet, litigation has limits. Glaeser and Shleifer (2006) argue that the shift to regulation in the United States (US) during the Progressive Era reflected the widespread view that courts were being subverted through bribery or political pressure and consequently failing to impose sufficient penalties. Relying on courts may also be difficult because of subversion in many poorer countries today, where courts are either too expensive to use, too overburdened, or too easy to subvert. Moreover, the magnitude of any particular urban harm may be hard for courts to assess, and the damage done by a butcher or slaughterhouse may harm general public health, rather than any one neighbor.⁴

⁴ In principle, class action lawsuits make it possible for the tort system to address general harm. But the law concerning such joint lawsuits was only developed in 19th century America through cases such as *West v. Randall* (1820) and *Smith v. Swormsted* (1853).

To my knowledge, the regulation of slaughterhouses in the US, and the regulation of land use more generally, began in Massachusetts in 1692. In that year, the government of Massachusetts Bay Colony passed legislation enjoining the leadership of Boston, Salem, and Charlestown to “assign certain places in each of said towns (where it may be least offensive) for the erecting or setting up of slaughterhouses.” These places were to be the only areas where “all butchers and slaughtermen, distillers, chandlers, and curriers shall exercise and practice their respective trades and mysteries.” The cost of violating this rule was 20 shillings. Friedmann (1973) writes that “Boston selected three such areas, all near the water.” In essence, Boston reproduced the same spatial segregation by law that Japanese religious tenets had established by social norm.

Stangl (2019) argues that San Francisco’s attempts to control slaughterhouses in the 1850s were the direct antecedents of modern zoning. In the 19th century, cholera outbreaks often motivated public health initiatives, including the regulation of slaughterhouses. The common explanation for cholera in the mid-19th century was that it was caused by airborne vapors or miasma. Consequently, cleaning up the city was seen as providing protection against the disease. Such concerns seem to have motivated San Francisco’s leaders in 1852 when they passed an ordinance intending to “proscribe” butchers “from the urban core” (Stangl 2019). Stangl (2019) also describes how “poor wording left it unclear whether they should be inside or outside of this area” and that “the ordinance was repealed in May [of the same year] and replaced by regulations on building construction and disposal of offal and blood.”

Such regulation of process would seem to be a substitute for spatial zoning. If you can make the production sufficiently safe, then it should be able to go anywhere. Yet it is often harder to enforce a regulation about the safety of work process than to enforce a regulation about work location, and in San Francisco “lack of enforcement proved an issue” (Stangl 2019). The city reverted to the policy of creating a limited zone on the northern part of the city that allowed slaughterhouses. The state formally granted the city the right to place spatial limits on slaughterhouses in 1858.

That state legislation was intended to protect the local ordinance against litigation, and the 19th century urban regulation of slaughterhouses did play a significant role in legal history. A butcher named Schrader challenged the right of the city to spatially limit his trade, but California rejected his claim in 1867. That court’s ruling affirmed the right of local governments to legislate (if the state government gave them the power to do so), not only for public health motives but also

for reasons of “public morals and safety.” In the even more significant “1872 Slaughter-House Cases,” the US Supreme Court validated Louisiana’s decision to create a private company that would own the only space around New Orleans where slaughtering animals was allowed. Not only did the US Supreme Court affirm Louisiana’s decision on the basis of public health concerns, but it also voiced a particularly narrow interpretation of the 14th Amendment, which would make that amendment too weak to protect freed slaves from discriminatory local statutes (Stangl 2019).

Brinkley and Vitiello (2014) detail the broader attempts to separate farm animals from urbanites in the US. In the early 18th century, Philadelphia passed a law that “prevented cattle and swine from running at large through the streets.” In the mid-19th century, regulation of urban dairies became ubiquitous. Decades before Euclidean zoning would separate manufacturing from urban residential areas, departments of public health were separating agricultural activities from city homes.

Local land use restrictions began with the attempt to reduce urban illness, but these powers once established were used for a far wider range of purposes. New York City’s 1916 zoning code was motivated by the large shadow that the Equitable Building cast on Broadway. Euclidean zoning, which the Supreme Court endorsed in 1924, allows towns to tightly control activities through local land use regulations. These regulations also appear to increase housing prices, accentuate housing price volatility, and reduce the growth of highly productive places (Glaeser and Gyourko 2018).

B. Enforcement and Urban Density

Regulations aimed at limiting externalities require enforcement, as do ordinary laws that protect the lives and property of ordinary citizens. Yet, the enforcement of rules can often be more difficult in dense urban areas. Moreover, empowered police officers often face the temptation to extract bribes and abuse their power. In this section, I discuss the ways in which urban density interacts with law enforcement.

In many ways it is natural to differentiate the regulation of activities that negatively impact public assets—which include public spaces, sources of water, air quality, and views—with the regulation of activities that negatively impact other people’s private assets, particularly taking or destroying their property. When activities harm other people’s private assets, the presumption is

that the activity is forbidden. When activities impact public spaces, the presumption is less clear. Yet from the perspective of enforcement, the problems are quite similar. In both cases, urban density makes the crime easier to commit and the criminal more difficult to catch (Glaeser and Sacerdote 1999).

As discussed above, cities make externalities more common (i.e., easier to commit), because people live nearby and because urbanites often share common assets. Proximity also reduces the travel costs involved in theft, especially since bringing purloined property home can be a particularly vulnerable moment for the criminal. Street-based larceny, such as picking pockets, becomes easier when the number of pedestrians on a street increases. Criminals are harder to catch in cities because of urban anonymity and because the number of potential suspects for any crime will be much larger in a big city. Glaeser and Sacerdote (1999) document that in the US, the probability that any given crime leads to an arrest is lower in big urban areas and that the returns to crime also appear to be somewhat higher.

The enforcement of urban rules is typically done by some combination of the community and formal police. Community enforcement was more typical before the modern era. For example, in England before the Norman Conquest, “the Saxon frankpledge required all adult males to be responsible for the good conduct of each other and to band together for their community’s protection.” Community enforcement has distinct advantages—it can be flexible, humane, and less vulnerable to corruption—but it also suffers from the free rider problem. Ordinary citizens may not want to risk a fight against an armed criminal. While there were law enforcement officials in ancient societies, such as Rome’s quaestors and the PRC’s prefects, modern policing is typically thought to have begun with Louis XIV in Paris in 1666.

The Sun King’s adoption of formal policing reflected the fact that community enforcement gets harder with urban scale, and Paris had grown large. The free rider problem becomes more extreme when there are more people in the community. Community punishment is most effective when it is hard to just leave the community, which is typically true in small, isolated rural villages. In a big city, it is easier to find a new community, which makes it harder for anyone’s old community to sanction its members.

Corruption is a central problem with police enforcement, both in the developing world today and in the history of the wealthy world. New York City policeman Alexander “Clubber” Williams, reportedly coined the term “tenderloin district,” which refers to a red-light district in

Manhattan, when he was quoted as saying: “I’ve been having chuck steak ever since I’ve been on the force, and now I’m going to have a bit of tenderloin.” Mr. Williams was going to upgrade his meat-eating habits because of the bribes he anticipated receiving from brothelkeepers. Likewise, in many Latin American cities today, journalists regularly report connections between police officers and drug gangs.

The literature on bribery distinguishes between settings in which only the guilty pay bribes and settings in which both the guilty and the innocent pay bribes (Ashraf, Glaeser, and Ponzetto 2016). In the former case, corruption effectively dilutes the size of punishment, which will lead to more crime, unless the formal punishment is increased in anticipation of bribery. In the latter case, incentives to not commit crimes are diminished because even the innocent are punished, and the police can become more of a problem than a solution. In both cases, the formal justice system becomes more relevant as a threat than as an actual working institution.

As the widely watched video of George Floyd’s murder illustrates, police violence can be as terrible as police corruption. People also die in police custody in India, which supports that there is some truth to the brutal image of the Indian police conveyed in movies like “Slumdog Millionaire” (Rao 2020). Police violence can be a response to fear, or an attempt to extract information, or just a reflection of an innate taste for brutal action. Alchian and Demsetz (1972) famous line asked, “but who will monitor the monitor?” when referring to managers in a corporate setting. If anything, the challenge of monitoring police officers is even more difficult.

Managing police forces is a major challenge in all parts of the world with high crime rates, and even in some low-crime areas where police have gotten used to either brutality or corruption, or both, at least with respect to some population subgroups. There is a long history of police reform. Indeed, the investigation of New York’s Lexow Committee discussed the misdeeds of “Clubber” Williams and his fellow officers, which in turn led to the election of a reforming mayor, who appointed Teddy Roosevelt as police commissioner. Changing management is usually the first step in reforming a dysfunctional organization.

Two of the most typical reforms have been police rotation and greater citizen accountability. Rotation serves mostly to reduce the link between police officers and a community, which is thought to be helpful in reducing corrupt deals. Yet, rotation also reduces officers’ knowledge of the community, which may make it harder to catch criminals. There is also little reason to suspect that rotation will reduce police violence against citizens.

Citizen accountability offers the possibility of fighting back against either police brutality or extortion. Hu and Conrad (2020) find that the introduction of “police complaint authorities” in India reduced human rights violations. These authorities are outside of the police force, but with an effective and appropriately incentivized police chief, measurement of police behavior might be enough. Presumably, the leader would manage in a way that improves the quality of police behavior if she knew that she would lose her job unless police behavior improved.

I now turn from safety against criminals and police to safety against outsiders.

C. Urban Infrastructure

The start of the tale of Gilgamesh describes its hero’s achievements: “[He] built the rampart of Uruk-the Sheepfold, of holy Eanna, the sacred storehouse” (George 1999). The epic then urges the reader to “see its wall like a strand of wool, view its parapet that none could copy.” The story also ends at the Walls of Uruk, as Gilgamesh tells the ferryman Urshanabi to climb the wall and inspect its quality. In the very last sentence, Gilgamesh emphasizes the large area that his wall encloses. Gilgamesh is urban. He opposes, tames, and then befriends the wild Enkidu. Wall-building is the greatest accomplishment of civilization’s first champion.

The archeological record confirms the central role of walls in humanity’s first cities. A façade of the “holy Eanna” described as a “sacred storehouse” in the Epic of Gilgamesh, from 1500 BCE is one of the highlights of Berlin’s Pergamum Museum.⁵ Walls are among the most striking features of the ruins of humanity’s oldest cities including Catalhoyuk, Jericho, Mohenjo-Daro, Uruk itself, and the ancient cities of the Yellow River Basin (Zhang and Wang 2019). In the Kaogong Ji, probably written in the 5th century BCE, city design is linked closely to walls and the number of gates in those walls. In a world of weak states and marauding raiders, walls provided safety.

Walls also generate an intrinsic return to scale. If each person requires a fixed amount of living, then the area of the city scales with the city population; but the circumference of the city will scale only with the square root of the city’s population, as least for typical shapes such as the circle (used by ancient Persian and Mesopotamian cities) or rectangle (used by ancient Chinese

⁵ Staatliche Museen zu Berlin. Research–Façade of the Temple of the Innin of Karaindash.
<https://id.smb.museum/object/1744134/fassade-des-innin-tempels-des-karaindasch-ausschnitt>.

cities). Consequently, the wall length per person declines by the square root of the city's population. The more populous the city, the less the cost of building, maintaining, and manning the city's walls per capita. This simple geometric fact may have created the world's first agglomeration economy.

In a world without widespread security, walls were the uniquely necessary form of urban infrastructure. The other common forms of urban infrastructure—such as temples, roads, sewers, and aqueducts—also generally exhibited scale economies, which tends to make them natural monopolies and often public. The British House of Commons Library reminds us that “historically, cities were settlements with a cathedral, and those places remain cities.” Cathedrals were the largest fixed investment of the Middle Ages and remained the world's tallest buildings until the end of the 19th century.

Infrastructure is linked to density because valuable physical investment attracts people and because some forms of investment make urban density easier to endure. Walls and cathedrals are both examples of large physical structures that attract people, either for safety or for access to the economic and spiritual advantages of locating in an Episcopal seat. Transportation infrastructure, including harbors and railyards, have also served to attract businesses and people. The two central business districts of Manhattan, Wall Street and Midtown, are located near Manhattan's traditional harbor and Grand Central Station, which was built at the northernmost point of the mid-19th century city. In the PRC, Beijing (Dadu), which became the capital during the Yuan Dynasty, was connected to the south of the country by the Grand Canal system's Northern Canal.

Other forms of infrastructure react to population density and help to reduce the downsides of density, such as contagious disease and traffic congestion. According to Livy, Rome's last king, Tarquinius Superbus, built the Cloaca Maxima, “a subterranean tunnel to receive all the sewage of the city,” which required “workmen from all parts of Etruria,” as well as local plebians. Rome would complement this with aqueducts starting in 312 BCE, when (again according to Livy), the Censor Appius Claudius built the first of eventually 14 aqueducts that were “successively constructed to supply the Romans with pure water.” Allegedly, this ancient piece of infrastructure “was nearly eight miles in length and ran almost the whole way underground.”

Much of the world's infrastructure is not public, but there are at least three plausible justifications for why the public sector has a role to play in infrastructure investment: (i) access to capital markets, (ii) the “natural monopoly” aspects of some infrastructure, and (iii) externalities

that are created by the infrastructure. Infrastructure can also appeal for less laudable reasons, including its ability to provide employment for political allies and a desire for physical monuments. While some infrastructure investment is necessary, not all investment is wise, and some skeptical cost-benefit analysis is almost always warranted.

Within 9 years of its opening, the tolls and fees paid to the Erie Canal covered its construction costs, which suggests that it could have been an extremely successful private investment.⁶ Yet, the scale and risk of such a private investment was too large for early 19th century capital markets to handle, and only a state was capable of funding such a large investment. Cutler and Miller (2005) argue that US municipal investments in water during the 19th century depended on the development of bond markets. Capital markets have expanded enormously since then, but the private funding of large-scale infrastructure can still be difficult in settings where public entities cannot commit to either fully or partially expropriate investments by regulating fees downward.

The large up-front cost of infrastructure can also include marginal costs that are below average cost, which means that either prices are inefficiently high or there is a shortfall between revenues and costs that must be financed in some other way. This divergence is most obvious when it comes to uncongested streets and sidewalks. Charging pedestrians a fee for strolling along urban boulevards would lead to inefficiently empty streets, but the streets still need to be maintained.

Governments have often handled the natural monopoly problem of infrastructure directly through public ownership or via regulation. In some cases, unprofitable transportation infrastructure can be subsidized through other activities. Hong Kong's Mass Transit Railway has done this successfully by owning real estate that benefits from its transit investments. The Port Authority of New York and New Jersey, a public parastatal entity, has accumulated many different forms of infrastructure, such as the New York–New Jersey Port Authority Trans-Hudson train, because of revenues from its ports. The history of the Port Authority also reminds us that it can be challenging to manage an unwieldy combination of difficulties (Sagalyn 2016).

The last and strongest argument for public investment in infrastructure is that the infrastructure is associated with positive externalities, such as reducing the spread of contagious disease. Cutler and Miller (2005) document that investment in clear water had a remarkably large impact on mortality in 19th century cities. I will discuss New York's sanitation experience in more

⁶ Canal Corporation. Background–Erie Canal. <https://www.canals.ny.gov/>.

depth in the following subsection on externalities and policing. Other forms of infrastructure will also generate a positive externality if they increase the value of land that is not owned by the infrastructure provider itself, although that may be harder to accurately assess than the impact of aqueducts on cholera.

III. How Are Urban Governments Different from For-Profit Companies?

What limits the effectiveness of urban governments? Rather than comprehensively answering this question, which seems far beyond the scope of one article or even one book, this section discusses how urban governments differ from firms. City governments differ throughout the world, but almost all cities have some public sector entity or set of such entities that are meant to provide the city services discussed above including urban infrastructure, local regulation, and policing. In some cases, local leaders are elected, as in Japan, and in other cases, such as in the PRC, they are appointed by a higher level of government. In India, state governments and their civil services are extremely empowered and exert a great deal of oversight over cities. New York City's mayor practically rules his own fiefdom. Yet in all of these countries, governmental entities act in cities to manage roads and enforce rules, and these governmental entities share attributes that make them different from private companies. The limitations placed on urban governments can at least partially explain some of their shortcomings.

Urban governments are also different from national governments. City governments typically have responsibility for a limited set of tasks, whereas national governments often take on new jobs (although they rarely shed old jobs). City governments have more limited taxation powers, and they are not responsible for foreign affairs (although many city governments do engage in limited outreach to other countries, such as sister-city programs). Large-scale redistribution is typically outside of city governments' responsibility and ability.

Perhaps most significantly, city governments are far less ideological. New York Mayor Fiorella LaGuardia famously quipped that "there is no Democratic or Republican way of cleaning the streets," which nicely captures the fact that city governments have a limited set of tasks, and they are often judged on how well they achieve those tasks. Ferreira and Gyourko (2009) compare Democratic and Republican mayors who have won office in extremely narrow elections. They find

that these mayors do very similar things, which is not true for politicians elected to national office. This evidence supports the view that city government is relatively free from standard political ideologies.

Like companies, city governments focus on delivering a narrow set of services to consumers, and those consumers care about the quality of those services. In this section, I focus on the most important differences between city governments and companies. I then turn to the implications of those differences for PPPs, and I end with the problem of procurement.

A. Companies and City Governments

In this section, we focus on five core differences between city governments and private companies: (i) the nondistribution constraint emphasized by Hart, Shleifer, and Vishny (1997); (ii) public entities are also typically limited in their pay and personnel flexibility, which can make it difficult for them to provide strong incentives for their workers (Bold, Collier, and Zeitlin 2009); (iii) city governments typically must provide a fixed set of services and cannot choose to jettison underperforming divisions; (iv) successful local governments cannot expand and take over new markets; and (v) for-profit firms have strong financial incentives to hide information about what makes them effective, while governments are often legally compelled to be open. While these statements are true for most local governments, there are, of course, exceptions. The implication of these five statements, which I will stress at the end of this subsection, is that the one great advantage that city governments have is their ability to learn from each other and that learning could be far more common than it is today.

In some cases, Max Weber's (1919) statement that "the state is considered the sole source of the 'right' to use violence," may also be important, but it is less clear this distinction is so germane in this context. In many settings, cities have an extremely limited ability to punish their citizens with violence, as criminal laws are passed by high jurisdictions. Moreover, the state's monopoly over actual (as opposed to legitimate) violence can also be weak in the world's highest crime metropolises.

Hart, Shleifer, and Vishny (1997) provide a justly celebrated model of the "proper scope of government" based on the public nondistribution constraint. The nondistribution constraint means that when a government saves money, those funds do not go directly into the coffers of political leaders, and this is true in all but the most kleptocratic regimes. In their model, the impact of the

constraint is that public entities will not engage in cost- and quality-cutting behavior. This argument creates one argument for why certain public activities, such as providing security at airports or running prisons, should not be privatized.

Glaeser (2004) borrows their core idea and applies it to the question of whether city services should be provided by public sector workers or contracted out to a private company. As in Hart, Shleifer, and Vishny (1997), private entities face lower costs. But private entities have strong incentives to bribe local governments, either to get better contract terms or to get the government to overlook low-quality provision. This danger is particularly real in procurement contracts when public entities buy services from private entities.

Procurement contracts provide a natural means of corruption where the public sector overpays private providers and then politicians receive some share of the surplus. New York's Tweed Courthouse is an especially famous example of municipal corruption working through the procurement process. The New York City mayor's official website notes of the building, which now houses New York City's Department of Education, that "Tweed Courthouse is the legacy of Tammany Hall boss William M. Tweed, who used the construction of the building to embezzle large sums from the budget"⁷

The second difference between the public and the private sector follows from the first: The public sector is typically far more restricted in its ability to pay its workers. These restrictions are natural partners of the nondistribution constraint, because if pay were unrestricted then political leaders could extract a great deal of resources for themselves. Many of the limitations on pay also reflect different institution features, such as union contracts and civil service rules, which are not present everywhere.

Starting in the 19th century, many countries embraced civil service reforms, which insulated bureaucrats from the whims of their political masters. Rigid pay schedules were often part of those reforms, as were limitations on termination. Before these reforms, the norm was that many public sector workers would lose their jobs whenever their party was out of office. Fighting this "spoils" system was a significant reform objective in the US in the 19th century. Rigid rules about pay and personnel were tools to limit the ability of politicians to turn public sector workers into a political machine. Union contracts also typically contain rigid pay schedules and make it

⁷ New York City Office of the Mayor. A Brief History of Tweed Courthouse. https://www.nyc.gov/html/om/html/tweed_courthouse.html.

hard to fire workers. Arguably, unions also appreciate that rigid pay schedules and limitations on termination make it harder for management to influence their workers.

Of course, these institutional details are not present everywhere. Some countries, such as Singapore, actually pay senior bureaucrats like private sector workers. Other countries, including the PRC, seem to provide fairly strong incentives for many of their civil servants (Zuo 2015).

The limitations on pay flexibility and the ability to fire may be understandable, but they certainly make the job of the public sector manager much more difficult than her private sector equivalent. This disadvantage is particularly important for tasks that require highly skilled workers, who would typically earn far more than public sector pay schedules permit, or when providing strong incentives is important. Bold, Collier, and Zeitlin (2009) argue that restrictions on public pay provide one reason for turning to PPPs. Private sector consultants who work for the public sector provide another means of bypassing rules about public sector compensation.

With city governments, inflexibility in function accompanies inflexibility in personnel practices. A for-profit company that makes widgets poorly and consequently loses money because of its widgets division will shut that division town. A city government that does a bad job controlling traffic cannot just give up on their streets. City governments are entrusted with a core set of tasks, which differ from country to country or even from state to state, but what they are entrusted with, they are stuck with those tasks.

There are more ephemeral functions that have been taken on by some city governments, and these functions may be seen as being optional. Cities that decide to provide public housing may be able to stop providing that housing. Nonetheless, all local governments have been assigned a core set of jobs by voters or higher levels of government or constitutions, and they are stuck with those jobs.

Of course, they can outsource those jobs to private providers, and that is the topic of the next subsection. But even if city government “privatizes” its trash collection, that government is still ultimately responsible for seeing that the trash gets collected. The city leader’s management role has just shifted from direct control to control through a contract.

Similarly, effective city governments are not allowed to expand into new markets. If Bangalore is doing a better job with public transit than Mumbai, Bangalore cannot just enter Mumbai’s market and start competing. Mumbai’s government has monopoly control over its space.

The effective market of a city is inflexible, while the effective market of a private firm is flexible. This means that the effective market for urban public services within a country is often vastly more competitive than the effective market for many industrial products. It also means that inefficient entities remain in the market for urban public services far longer than such entities remain in private markets.

Of course, there is some limited competition in city government. As Tiebout (1956) argued, city governments do compete to attract talent because people can vote with their feet. In democratic regimes, there is also competition between different leaders for voters. In more autocratic regimes, bureaucrats will be competing for favor from above.

It is also true that sometimes cities do expand, although this almost always requires the blessing of some higher level of government. Jackson (1987) provides a magisterial history of municipal consolidation in 19th century America, in which suburbs chose the benefits of scale economies in public services over their independence. In the 20th century, consolidation became far less common, largely because suburbs preferred not to be incorporated into large cities.

A final difference between for-profit companies and city governments is that companies have a stronger incentive to hide information about what makes them effective, precisely because they are competing with one another. Perhaps the most famous example of this fact is Coca-Cola's "vault of the secret formula," which contains the recipe behind that extremely popular product. But even when firms do not hide the secrets to their success in tricked-out safes, they still have every reason not to let their competitors know how to replicate their successes. A management consulting industry exists, and it works partially by transferring knowledge across firms, but there are profound limits to what companies allow outsiders to know.

By contrast, successful cities have every reason to reveal their methods. Mayors want to show off to voters or their political superiors. Lesser bureaucrats also have little to lose by setting an example for other cities. There is, of course, less willingness to be open about failure, and there are areas so sensitive that governments will not even admit to experimenting. For example, police departments will often do things on an experimental basis, but publicizing the results of these experiments leaves them open to the charge that people were robbed or killed because they ran risks. Weighing against this tendency is the existence of freedom of information acts, which legally force governments to reveal things about their operations.

This litany of differences comes down to two main points. There are many ways in which city governments are hobbled relative to private firms. They have inflexible pay practices. They often have difficulty firing workers. They cannot shed core functions or take over other cities. Yet, set against those disadvantages is one great advantage: City governments can learn from thousands of other city governments.

The very uniformity of task makes learning easier. The fragmentation of the market means that there are lots of different governments to learn from. Secret methods are not critical to any city's future success.

Yet city-to-city learning is still quite limited. Even if governments have no incentive to hide their information, they have little incentive to share it either. Moreover, cities typically do not have the personnel needed to actively learn from other places around the planet. Entities like the Asian Development Bank have the capacity to greatly support such learning. I now turn to discussions of the hybrid forms of public–private activity: PPPs and public procurement.

B. Public–Private Partnerships

Do PPPs provide an opportunity for weak urban governments to improve effective public sector capacity? The answer to this question is unclear both on theoretical and empirical grounds. Engel, Fisher, and Galetovic (2014) provide an excellent overview of PPPs. In relatively high state capacity environments, such as Chile, the track record of these partnerships is generally positive or mixed. In weaker states, especially those in sub-Saharan Africa, PPPs have worked out poorly.

There are advantages to private entities providing public services. Bold, Collier, and Zeitlin (2009) see flexibility in pay and personnel as being a crucial private sector advantage. This flexibility enables private companies to attract better workers, fire weaker workers, and provide stronger incentives for the workers who stay. In principle, this should mean that private entities are more effective, especially in tasks requiring specialized skills or strong incentives.

Engel, Fischer, and Galetovic (2014) emphasize the incentives that PPPs face to maintain infrastructure. When the structure of the contract is the private entity pays a fixed cost either to build an asset or to buy an asset from the state and then recoups that investment through user fees, the entity has good incentives to maintain the asset so that it continues to be used. Adam Smith

(2002 [1776]) explains this idea in *The Wealth of Nations* with the example of the Languedoc Canal:

When that great work was finished, the most likely method, it was found, of keeping it in constant repair was to make a present of the tolls to Riquet the engineer, who planned and conducted the work. Those tolls constitute at present a very large estate to the different branches of the family of that gentleman, who have, therefore, a great interest in keeping the work in constant repair.

Riquet received the revenues, and hence had the right incentives to maintain the canal.

Yet even without user fees, road quality can still sometimes be better under PPP management. Singh (2018) documents a huge disparity in smoothness between public and private roads even when there are no user fees. His explanation for the difference in smoothness is that private entities manage the procurement process better. The public does little to ensure that roads are built well initially.

A more nuanced benefit of private provision is that the private entity may be able to withstand political pressure to inefficiently lower prices, while that pressure might prod a public entity to cave. The political sensitivity of public entities, however, can also be a benefit. Troesken (2004) documents a dramatic increase in water quality and decrease in mortality for African Americans associated with public water provision.

Yet, there are also problems with using private providers, which are associated with the nondistribution constraint discussed above. The public sector workers generally have weak incentives to protect the public's finances. A private sector entity has strong incentives to subvert the government and extract those finances for its own benefit. When a weak public sector confronts an effective public sector entity, the outcome may be looting of the public sector rather than better public services.

In a PPP that is expected to operate without subsidy, surviving only on user fees, the risks are less severe. If a private entity that manages infrastructure has contracted with the government to keep its prices relatively low, based perhaps on a reasonable return-on-investment, then the entity may renegotiate its contract with a compliant state and get permission to charge higher prices. The entity may also skimp on quality, but the desire to earn user fees will mitigate against

excessive quality cutting. The biggest risk in these settings is just that the price will revert to the monopoly price.

The risks are far greater if the expectation is that there will be a public subsidy for the activity. In that case, there is no natural limit on the rent-seeking activity and the public resources that can be extracted by the PPP (Glaeser 2012). Some of the worst cases discussed in Engel, Fischer, and Galetovic (2014) are indeed settings where a PPP has managed to extract large resources from the public service for providing low-quality service. Consequently, the downsides of PPPs are larger when the public sector cannot commit to not providing subsidies. This argument suggests that using PPPs is particularly difficult for services that generate positive externalities where some kind of subsidy is typically welfare enhancing. I now turn to public procurement.

C. Public Procurement

Even when the public sector is directly in charge of a service like cleaning the streets or repaving roads, there can still be significant private involvement. For a large number of cases, the public sector will buy inputs or hire services from private firms. The average country spends 15% of its gross domestic product on public procurement (Bosio et al. 2022) and effective procurement is a major form of public sector capacity.

Procurement is also a particularly natural opportunity for corruption, as it is the primary form in which public money leaves the government and moves directly into the accounts of private companies. If the government overpays for work, then the surplus can be shared between the contractor and representatives of the government, as it was in the case of the Tweed Court House mentioned earlier. An 1871 Committee of Prominent New Yorkers issued a report that claimed, “over \$11,000,000 have been charged for outlays on an unfinished Court House, for which building completed, an honest estimate of real cost would be less than \$3,000,000” (Townsend 1901). That estimate suggests that at least \$8,000,000 (more than \$200,000,000 in 2023 dollars) was available to share between the builders and Tweed and his associates.

The susceptibility of procurement to corruption explains why the procurement process is often extremely regulated (Bosio et al. 2022). This regulation is not the typical regulation where the government restricts the freedom of a private individual, but rather rules in place to constrain the actions of a government official. These rules can govern every aspect of the procurement

process from the initial advertisement to addressing bidding irregularities. Even if regulations require the procuring entity to take the lowest bid, that entity may still be able to favor friendly businesses by disqualifying competitors on the basis of minor errors in the application process.

Regulating procurement officials comes with clear tradeoffs. Bosio et al. (2022) find that regulation is associated with less corruption, especially in lower-income countries. The rules do seem to work somewhat, but they also make it difficult for the procurement agent to use any initiative or local knowledge. The model in Bosio et al. (2022) emphasizes that regulation eliminates the ability to favor higher-quality bidders while it lowers corruption. In other settings, regulation surely slows down the bidding process and makes it difficult for many firms to navigate the process.

The key finding in Bosio et al. (2022) is that regulation is associated with generally better outcomes in poorer countries, but worse outcomes in richer countries. Particularly well-functioning governments, like Singapore, regulate their procurement officials lightly. Presumably, they are trusting to the strong incentives within Singapore’s government to ensure that the agent will use that discretion to get better outcomes rather than bribes. This suggests a broader point that if the capacity of public sector workers improves, regulations may become mismatched. Rules designed for the era of Boss Tweed may not have been a good match for the less corrupt age of New York City Mayor Michael Bloomberg (2002–2013).

Even if the bidding process is handled honestly and well, large projects often have costs that balloon whenever there is a need for renegotiation. Massachusetts’ Central Artery Project, the “Big Dig,” was originally supposed to cost under \$3 billion. The final cost was many times that amount. Ballooning project costs also plagued New York’s Second Avenue Line extension and California’s High-Speed Rail. It is hard to apportion credit for the gaps between projections and final costs. Some fraction surely represents overoptimistic projections that are used to convince the public to go ahead with the project, but some fraction also represents the challenges that occur when there is a need for renegotiation—and in big, complex projects, there is always a need for renegotiation.

The central problem with renegotiation is that the competitive situation that existed at the initial bid stage has become a one-on-one negotiation. It is inevitable that the contractor can extract rents from that situation. Even without renegotiation, change in project scope can increase project cost. Bolotnyy and Vasserman (2023) examine unit price auctions where contractors bid with

prices for each input so that when the number of inputs change, there is no need for renegotiation. The procuring entity gives an estimate of the number of inputs needed in the project, and the low bid based on that estimate wins the bid. But even in these auctions, bidders typically bid high prices for the inputs that end up being used more than expected and low prices for the inputs that end up being used less.

Procurement is done by thousands of governments around the world. Even the number of transportation-related procurement events is astounding. This provides an enormous opportunity for governments to learn from one another.

New York University's Transit Cost Database provides a great source of information about the costs of different transit projects. It documents how extraordinarily expensive such projects are in the US. But big projects provide less of a natural channel for learning because they are typically somewhat unique. The smaller events, paving and repaving roads, for example, may provide more natural places to improve procurement through learning.

Two types of information are needed to create a learning process for procurement. First, there needs to be information on the bidding and renegotiation process. For example, how many bidders were there and what were their bids. Second, there needs to be information on initial bids, final costs, and quality. That type of information should make it possible to create a global community of learning around procurement.

This is an area in which global entities, like the Asian Development Bank and the World Bank, which invest in infrastructure, could play an outsized leadership role. These entities are committed to improving the world's infrastructure. That infrastructure is often built and maintained by local governments. More knowledge about what works in procurement could possibly drive down costs across the planet.

IV. Learning and Climate Change

Learning is far easier in a static environment. When conditions are changing rapidly, then learning becomes much harder. Climate change may create enormous challenges for many of the world's cities, and it may do the most damage to the world's poorest places. Yet it will be hard for

cities to learn from one another if they operate in an entirely reactive mode. In this section, I discuss the interplay between climate change and urban government, and strategies for learning that do not require waiting until the sea level dramatically rises.

My discussion will focus on adaptation rather than mitigation. The economics of mitigation are relatively straightforward: The usual proposed remedies are a Pigouvian tax on carbon with some subsidies for research. There is relatively less need to learn about mitigation policy. There is tremendous scope for learning about low carbon technologies, but vast industries, such as the producers of electric cars, focus on that kind of learning. City governments have rarely been the developers of new technologies. By contrast, city governments directly face the risks of heat and flooding that may lie ahead. If those governments are going to ameliorate the potential downsides of climate change, then they will have to develop new tools.

A. Climate Change and Cities

Cities are both particularly vulnerable to climate change and a potential source of protection against the worst ravages of global warming. Both heat and flooding can be particularly difficult in urban settings. Many cities are located near water that is prone to flooding. Yet, a globally linked urban economy will be far more adaptable than subsistence agriculture in sub-Saharan Africa. Moreover, widespread agricultural populations may be harder to protect than spatially concentrated urbanites.

As documented by the Harlem Heat Project, temperatures indoors can get significantly hotter than temperatures outdoors, and there is less variation in temperatures inside (Vant-Hull et al. 2018). If urbanites are more likely to stay inside than inhabitants of lower density areas, then they are more likely to die from heat. Klinenberg (2003) provides an insightful analysis of the 1995 Chicago heat wave that killed over 700 people, and his evidence also points to the dangers of remaining indoors. In the Chicago case, fear of crime and violence particularly induced older urbanites to stay inside. Cities also lack trees that can provide protective shade in some rural settings.

Many of the great cities of the world grew up as nodes on our global trade network. Consequently, they are ports. Yet, a location on the ocean means that they are both at a low elevation and particularly vulnerable to flooding from storms or tidal waves. This danger is only exacerbated if the city is covered largely with concrete, which cannot absorb large amounts of

water. The flooding can then either kill directly, or indirectly by creating large bodies of standing water that make it easier for disease-carrying insects to breed.

There are also advantages from urban life in a world with climate change. Most obviously, urbanites who produce services and goods that are sold worldwide are effectively hedged against climate-related shocks to local agriculture. Local subsistence farmers are acutely vulnerable to local weather conditions. If increasing heat levels make agriculture impossible in some parts of the world, then local farmers may starve. Urbanites should be able to import food from Canada or Argentina.

Finally, cities can potentially be protected from climate change more easily than widespread populations. For example, it is hard to imagine building a sea wall that would protect all of the New Jersey coast. It is possible to imagine a sea wall protecting New York City. It is also easier to imagine building cooling centers for at-risk populations in dense urban areas than to spread such centers across a lot of agricultural land.

Yet for these protections to work, governments must make wise investments. Once again, there is a complementarity between cities and public capacity. I now turn to ways in which cities might enhance their ability to adapt to climate change.

B. Climate Change and Learning

Changing conditions mean that a city's own experience may be a poor guide for the future. If a Latin American industrial city suddenly becomes the home of warring drug cartels, as Medellin did in the 1980s, then it is useful to learn from places with a more violent past. Climate change is likely to throw new problems at cities throughout the world, which will make it particularly important to know about solutions tried elsewhere.

Adaptation to climate change requires both *ex ante* forms of protection, such as removing residences from flood zones, and *ex post* crisis management. Crises are common, and learning from crisis responses is relatively straightforward. Evaluating *ex ante* protection can be far more difficult since it is much harder to evaluate the treatment effect of any particular action.

The difference between evaluating *ex ante* and *ex post* intervention lies in the distance between action and consequence, which is much shorter with *ex post* interventions. Consider an

urban flood and a response that evacuates neighborhood A but not neighborhood B. If 15% of neighborhood B dies but all of neighborhood A survives, few people will dispute that the evacuation had this impact. Consider, by contrast, an ex-ante intervention that increased the amount of grass in A relative to cement by 15%. Sorting out whether any ex-post differences in outcomes between A and B were due to the grass or some other factor will require much more work. Perhaps, drainage was better in A because of the grass, or perhaps A was wealthier, and people had more resources to escape.

The most obvious climate-change-related crisis comes directly from heat, which can be fatal. In June 2024, over 1,300 pilgrims died while performing Hajj as Mecca's temperature rose above 125 degrees Fahrenheit. Many of the fatalities occurred among unauthorized pilgrims, which emphasizes the difficulty of reducing climate change risk with regulation. Extreme heat is an old problem, even if it is relatively new to northern Europe, and so there is abundant experience with cooling centers, medical support, and sources of water such as misting towers.

Storms and flooding are far more complex crises, and they can be extremely deadly. The 1970 Bola Cyclone may have killed over 300,000 people.⁸ Kahn (2005) shows that wealthier nations with better political institutions experience far fewer deaths from national disasters, even though they face just as many disasters. This fact could mean that poorer cities can learn from richer ones, or it could mean that rich cities protect themselves with resource-intensive strategies that are unaffordable in the poorer parts of the world. In many cases, however, the primary response will be evacuation, ideally accompanied with some medical aid, and that should be possible in most environments.

While there is a great deal about floods that are unpredictable and that differs from place-to-place, it is still possible to learn from past crises. Motivated by the poor US response to Hurricane Katrina, Leonard and Howitt (2009) set out a program for “comprehensive risk management.” A widely accepted program describing the basics of crisis response, such as who is in charge and what their powers are, seems particularly valuable. Natural disasters are luckily rare for any one city, but they are common enough across the world that there are plentiful sources of learning about crisis management.

⁸ Arizona State University. World Meteorological Organization's World Weather and Climate Extremes Archive—World: Highest Mortality due to a Tropical Cyclone. <https://wmo.asu.edu/content/world-highest-mortality-tropical-cyclone>.

Unfortunately, learning about ex ante measures is more challenging. Painting public buildings and surfaces white is probably helpful, for example, because they reflect sunrays. Raising roads so that they are unlikely to wash out during a flood may make evacuations far easier. But even when cities are trying such interventions, they are rarely evaluating their actions, which makes learning particularly hard.

Learning is also hard because in many contexts, simple interventions that seem likely to save lives are hard to implement. Keeping informal settlements out of floodplains would seem to be a sensible form of urban planning. Yet if these floodplains are close to jobs, then migrants may move into these areas even if it is technically illegal. Similarly, developers may build in high-risk areas, such as Miami, precisely because they expect governments to make subsequent protective investments. Hsiao (2023) investigates this problem in the context of Jakarta.

Urban governments throughout the world will try to respond to climate change in many different ways. In a sense, all of these responses will be miniature experiments. The value of these experiments can be greatly enhanced if cities actually learn from one another. Entities like the Asian Development Bank have a tremendous capacity to help this learning occur.

V. Conclusion

This paper has made three primary points. First, effective governance is complementary to urban density, because dealing with externalities and managing shared infrastructure both benefit from good public institutions. Second, city governments face many handicaps relative to private businesses, but they have one tremendous asset: a greater ability to learn from their peers. Third, this learning is particularly important when it comes to adapting to climate change, since climate change will create events that individual cities have not experienced before.

Together, these three points suggest that entities that enable city-to-city learning can generate tremendous social value, especially when it comes to climate change adaptation. In some institutions, governments tasked with managing cities have the time to seek out knowledge from elsewhere, but such spare public capacity is relatively rare. If cities are going to learn, then they are going to need trusted partners to help with that process. Entities like the Asian Development

Bank and the World Bank have the global reach and capacity to enable cities to learn from each other.

References

- Alchian, Armen A., and Harold Demsetz. "Production, Information Costs, and Economic Organization." *The American Economic Review* 62, no. 5 (1972): 777-95.
- Ashraf, Nava, Alexia Delfino, and Edward L. Glaeser. "Rule of Law and Female Entrepreneurship." NBER Working Paper No. 26366. Cambridge, MA: National Bureau of Economic Research, 2019.
- Ashraf, Nava, Edward L. Glaeser, and Giacomo A. M. Ponzetto. "Infrastructure, Incentives, and Institutions." *American Economic Review* 106, no. 5 (2016): 77-82.
- Arizona State University. World Meteorological Organization's World Weather and Climate Extremes Archive—World: Highest Mortality Due to a Tropical Cyclone. <https://wmo.asu.edu/content/world-highest-mortality-tropical-cyclone>.
- Behrer, A. Patrick, Edward Glaeser, Giacomo Ponzetto, and Andrei Shleifer. 2021. "[Securing Property Rights](#)." *Journal of Political Economy* 129 (4): 1157–92.
- Bold, Tessa, Paul Collier, and Andrew Zeitlin. 2009. *The Provision of Social Services in Fragile States: Independent Service Authorities as a New Modality*. Centre for the Study of African Economies, Oxford University.
- Bolotnyy, Valentin, and Shoshana Vasserman. "Scaling Auctions as Insurance: A Case Study in Infrastructure Procurement." *Econometrica* 91, no. 4 (July 2023): 1205-1259.
- Bosio, Erica, Simeon Djankov, Edward Glaeser, and Andrei Shleifer. 2022. "Public Procurement in Law and Practice." *American Economic Review* 112 (4): 1091–117.
- Brinkley, Catherine, and Domenic Vitiello. "From Farm to Nuisance: Animal Agriculture and the Rise of Planning Regulation." *Journal of Planning History* 13, no. 2 (2014): 113-35.
- Campante, Filipe R., and Quoc-Anh Do. 2014. "Isolated Capital Cities, Accountability, and Corruption: Evidence from US States." *American Economic Review* 104 (8): 2456–81.

- Canal Corporation. Background—Erie Canal. <https://www.canals.ny.gov/>.
- Cutler, David, and Grant Miller. "The Role of Public Health Improvements in Health Advances: The Twentieth-Century United States." *Demography* 42, no. 1 (2005): 1-22.
- Engel, Eduardo, Ronald Fischer, and Alexander Galetovic. 2014. *The Economics of Public–Private Partnerships a Basic Guide*. Cambridge University Press.
- Ferreira, Fernando, and Joseph Gyourko. "Do Political Parties Matter? Evidence from US Cities." *The Quarterly Journal of Economics* 124, no. 1 (2009): 399-422.
- Flyvberg, Bent and Dan Gardner. 2023. *How Big Things Get Done: The Surprising Factors That Determine the Fate of Every Project, from Home Renovations to Space Exploration and Everything in Between*. Crown Currency.
- Friedmann, Karen J. 1973. "Victualling Colonial Boston." *Agricultural History* 47 (3): 189–205.
- George, Andrew. *The Epic of Gilgamesh: A New Translation*. London: Allen Lane, Penguin Press, 1999.
- Glaeser, Edward. "Public Ownership in the American City." In *Urban Issues and Public Finance: Essays in Honor of Dick Netzer*, edited by A.E. Schwartz, 130-62. Northampton, MA: Edward Elgar Publishing Inc., 2004.
- Glaeser, Edward. 2012. "The Political Risks of Fighting Market Failures: Subversion, Populism and the Government Sponsored Enterprises." *Journal of Legal Analysis* 4 (1): 41–82.
- Glaeser, Edward, and Andrei Shleifer. 2006. *The Rise of the Regulatory State: A Historical Perspective*. NBER Working Paper No. 12128.
- Glaeser, Edward L., Caitlin Gorback, and Stephen J. Redding. "JUE Insight: How Much Does COVID-19 Increase with Mobility? Evidence from New York and Four Other US Cities." *Journal of Urban Economics* 127 (2022): 103292.
- Glaeser, Edward, and Joseph Gyourko. "The economic implications of housing supply." *Journal of economic perspectives* 32, no. 1 (2018): 3-30.
- Glaeser, Edward L., and Bruce Sacerdote. "Why Is There More Crime in Cities?" *Journal of Political Economy* 107, no. S6 (1999): S225-S258.

- Hart, Oliver, Andrei Shleifer, and Robert W. Vishny. "The Proper Scope of Government: Theory and an Application to Prisons." *The Quarterly Journal of Economics* 112, no. 4 (1997): 1127-61.
- Hsiao, Allan. 2023. "Sea Level Rise and Urban Adaptation in Jakarta." Working Paper. [DOI]
- Hu, Shengkuo, and Courtenay R. Conrad. "Monitoring via the Courts: Judicial Oversight and Police Violence in India." *International Studies Quarterly* 64, no. 3 (2020): 699-709.
- Jackson, Kenneth T. *Crabgrass Frontier: The Suburbanization of the United States*. New York: Oxford University Press, 1987.
- Kahn, Matthew E. 2005. "The Death Toll from Natural Disasters: The Role of Income, Geography, and Institutions." *The Review of Economics and Statistics* 87 (2): 271–84.
- Klinenberg, Eric. 2003. *Heat Wave: A Social Autopsy of Disaster in Chicago*. The University of Chicago Press.
- Leonard, Herman B., and Arnold M. Howitt. 2009. "Chapter 2—Acting in Time Against Disaster: A Comprehensive Risk Management Framework." In *Learning from Catastrophes: Strategies for Reaction and Response*, edited by Tim Moore. Pearson.
- Maimonides, Moses. 1956. *The Guide for the Perplexed*. Routledge & Kegan Paul.
- Malani, Anup, Daksha Shah, Gagandeep Kang, Gayatri Nair Lobo, Jayanthi Shastri, Manoj Mohanan, and Rajesh Jain. 2021. "Seroprevalence of SARS-COV-2 in Slums Versus Non-slums in Mumbai, India." *The Lancet Global Health* 9 (2): e110–11.
- New York City Office of the Mayor. A Brief History of Tweed Courthouse.
https://www.nyc.gov/html/om/html/tweed_courthouse.html.
- Noda, Koji. 2024. "Night Soil to Chemical Fertilizer: Lessons from the Abolishment of the Circular Economy in Postwar Japan." *Circular Economy and Sustainability* 4: 1173–92.
- Rao, Mohit. 2020. "Indian Police Use Violence as a Shortcut to Justice. It's the Poorest Who Bear the Scars." CNN, December 3. <https://edition.cnn.com/2020/12/02/india/police-brutality-india-dst-intl-hnk/index.html>.

- Sagalyn, Lynne. 2016. *Power at Ground Zero*. Oxford University Press.
- Singh, Ram. "Public–Private Partnerships vs. Traditional Contracts for Highways: Comparison of Cost and Quality of Roads." *Indian Economic Review* 53 (2018): 29-63.
- Stangl, Paul. "San Francisco Slaughterhouses and American Proto-Zoning." *Journal of Planning History* 18, no. 4 (2019): 311-28.
- Szczygiel, Marta E. 2023. "Mechanization of Night Soil Disposal in Postwar Japan." *Yearbook for the History of Global Development* 2: 255–76.
- Smith, Adam. 2002 [1776]. *The Wealth of Nations*. Bibliomania.com Ltd.
- Staatliche Museen zu Berlin. Research–Façade of the Temple of the Innin of Karaindash. <https://id.smb.museum/object/1744134/fassade-des-innin-tempels-des-karaindash-ausschnitt>.
- Tiebout, Charles M. "A Pure Theory of Local Expenditures." *Journal of Political Economy* 64, no. 5 (1956): 416-24.
- New York:
- Troesken, Werner. *Water, Race, and Disease*. Cambridge, MA: MIT Press, 2004. "t" Watson, Burton. 1993. *The Lotus Sutra*. New York: Columbia University Press.
- Weber, Max. "Politics as a Vocation." Lecture to the Free Students Society at Munich University, January 1919. In *Max Weber: Essays in Sociology*, 77-128. 1919. " New York: ""