DISASTER AND RECOVERY: THE PUBLIC AND PRIVATE SECTORS IN THE AFTERMATH OF THE 1906 EARTHQUAKE IN SAN FRANCISCO

Douglas Coate, Ph.D.

Abstract

A severe earthquake in San Francisco in 1906 severed electrical and gas lines and collapsed chimneys. Fires resulted, burning for four days over 2800 acres. The commercial and residential center of the city was destroyed. Two hundred fifty thousand people of the city's 400,000 residents were left homeless, including a majority of public and private sector workers. Municipal records of land titles and bank account records were lost. Payouts from property insurance claims, necessary for rebuilding, were in doubt because policies covered damage from fires, but not from earthquakes. The municipal government was corrupt. Yet, within three years the city was rebuilt, commercial activity restored, and the population level recovered. Two public sector developments were key. The first was the actions of U.S. Army troops stationed outside the fire zone at the Presidio and Fort Mason. They moved to maintain order, protect property, and fight fires within hours of the earthquake. They patrolled the city for 74 days. These actions were extra-legal in that martial law was never declared. Army troops also built and maintained the communications network, took over the distribution of food and other supplies, and constructed and ran many of the relief camps. The second development was also extra-legal. The municipal government was displaced the day of the earthquake by a Citizens' Committee of business and civic leaders. This committee would control local government funds, including $10 million in donations, and dictate or cajole liberal land use, zoning, business licensing, and building trade rules to speed redevelopment and build confidence in the recovery. Thus, the U.S. Army and the citizens committee set the stage for rapid redevelopment by maintaining property rights and a legal and administrative framework conducive to a robust private market rebuilding of the city. In a narrow sense the uniqueness of the U. S. Army response and the displacement of the municipal government make the San Francisco recovery not generalizable to other disasters. In a broader sense, however, the extraordinary San Francisco recovery echoes Hirshleifer (2008): "Historical experience suggests that recovery [from a disaster] will hinge upon the ability of government to maintain or restore property rights together with a market system that will support the economic division of labor."

Introduction

> … Every telegraph office and station had been destroyed. All the banks, deposit vaults, and trust buildings were in ruins. Not a hotel of note or importance was left standing. The great apartment houses had vanished. Of the thousands of wholesale and large retail establishments scarce half a dozen were saved, and these in remote districts. Even buildings spared by the fire were, damaged as to chimneys, so that all food of the entire city was cooked over camp fires in the open streets. Two hundred and twenty-five thousand people were not only homeless, losing all real and personal property, but also were deprived of their means of present sustenance and future livelihood (Greely, 1906).

About the author

Douglas Coate is professor of economics at Rutgers University, Newark.

> Not in history has a modern imperial city been so completely destroyed. San Francisco is gone. Nothing remains of it but memories and a fringe of dwelling-houses on its outskirts. Its industrial section is wiped out. Its business section is wiped out. Its social and residential section is wiped out. The factories and warehouses, the great stores, newspaper buildings, the hotels and the palaces of the nabobs, are all gone (London, 1906).

> What has so often excited wonder, the great rapidity with which countries recover from a state of devastation; the disappearance, in a short time, of all traces of the mischiefs done by earthquakes, floods, hurricanes, and the ravages of war. An enemy lays waste a country by fire and sword, and destroys or carries away nearly all the moveable wealth existing in it: all the inhabitants are ruined, and yet in a few years after, everything is much as it was before (Mill, 1909).

> Historical experience suggests that recovery will hinge upon the ability of government to maintain or restore property rights together with a market system that will support the economic division of labor. Taking a broader view, the subject of disaster and recovery can be regarded as a special case within the general problem of economic development (Hirshleifer, 2008).

> The rebuilding of San Francisco was astonishingly fast and on a heroic scale…What San Francisco achieved in terms of almost immediately easing the harshness of life for its citizens and rebuilding the city was staggering in its size, speed and complexity (Fradkin, 2005).

Shortly after 5:00 a.m. on April 18, 1906, a 275 mile portion of the San Andreas Fault, centered just south of San Francisco, shifted about 10 feet to the northwest. A severe earthquake resulted, probably measuring closer to 8 than 7 on modern scales of earthquake measurement. Fires broke out immediately in San Francisco due to severed electrical and gas lines and collapsed chimneys. Water to fight the fires was scarce because of broken distribution lines. San Francisco was the largest city west of the Mississippi River, with a population of about 400,000 people. Its growth had been recent, occurring after the gold discoveries in the Sierra Nevada Mountains in 1848 and the silver discoveries in western Nevada in 1859. Most of the city's structures were wooden and commercial and residential population densities were high. Fires burned for four days, concentrated in the heart of the city. Twenty eight hundred acres of the city burned and 28,000 structures were lost, including all major hotels and commercial buildings.[1] Two hundred fifty thousand people were left homeless. Deaths exceeded 3,000, the second highest total associated with a natural disaster in U.S. history.[2] Remarkably, at least from the perspective of the 21st Century, the city was rebuilt, commercial activity restored, and the population level recovered within three years of the fire.

What explains San Francisco's rapid recovery from the earthquake and fire? Hirshleifer (2008) reminds us "the subject of disaster and recovery can be regarded as a special case within the general problem of economic development." And that "historical experience suggests that recovery will hinge on the ability of government to maintain or restore property rights together with a market system that will support the economic division of labor" (Hirshleifer, 2008). But the necessary conditions for redevelopment did not seem to characterize San Francisco after the

fire. The municipal government was weak and corrupt. San Francisco's mayor and its chief labor leader were soon to be indicted (in December, 1906) for extortion and bribery. Each would serve jail sentences. President Roosevelt through proclamation asked that financial aid be channeled through the Red Cross in order to bypass the city government, whose honesty and management ability he questioned. Redevelopment was also hampered by the loss of municipal records of land titles and by the loss of bank account records. The availability of funds from property insurance claims, which are particularly important to property owners in the financing of redevelopment in the early stages of recovery, was also in doubt. Property insurance generally covered damage from fires, but not from earthquakes. To what extent would claims be honored in San Francisco? Insurance companies had only paid on fifty percent of the policies after the great Chicago fire of 1871, a disaster in which earthquakes played no part.[3]

The Public Sector Response

Two developments, both extralegal, were critical to the restoration of public order and safety, the maintenance of property rights, as well as to the liberalization of land use, licensing, and building trade rules. This , ultimately fostered the belief that San Francisco would recover rapidly. The first was the response of U.S. Army troops stationed at the Presidio and Ford Mason Army bases, which were located for all intents and purposes within the City of San Francisco, but outside the fire zone. These troops with reinforcements would patrol the city of San Francisco for 74 days, the longest military occupation of any American city and the only occupation without a declaration of martial law. They would also build a communications network and take over the distribution of food and other supplies and construct and run many of the relief camps. The second development was the displacement of the municipal government by a citizens committee of 50, which consisted primarily of local business leaders, plus the mayor. This Committee controlled local government funds, including $10 million in donations (1906 dollars),[4]and dictated or cajoled liberal land use, zoning, business licensing, and building trade rules to speed redevelopment.

U.S. Army Troops. The Acting Commander of the Presidio and Fort Mason Army bases, Brigadier General Frederick Funston, lived in San Francisco on Russian Hill, a residential area that the fires would eventually reach. Funston recognized early in the morning of the day of the earthquake that the fires would be difficult to contain. He ordered all available troops of the 1,500 he commanded to report to downtown San Francisco to assist in maintaining public order. The first troops arrived at 7:45 a.m. and were used to patrol the financial district and to prevent looting on Market Street. At 8:45 a.m., Funston cabled the War Department to request "thousands of tents and all available rations." Additionally, Greeley was the Commander of the Presidio and Fort Mason Army bases. He was on leave at the time of the earthquake and fire and returned to San Francisco on April 22 to resume command. Their comments give a clear picture of the extent of the disaster and the role the Army played in restoring public order and confidence. Highlights of his report to the Army and the report of Major General Andrew Greeley (1906) to the Army follow. Funston's first impressions the morning of the earthquake:

> …100,000 people would be homeless before midnight. Telegraphic request was therefore made that all available tents and rations be forwarded as soon as possible. This step was considered necessary, as it seemed then that all supply

> warehouses, not only for food but for bedding and shelter, would inevitably be destroyed without the hope of saving even a small percentage of their contents. A fact which made the saving of property most difficult was that no wagons of any kind appeared to be in the vicinity of the fire to carry away any goods that it might have been possible to save."

Funston on the broken water mains:

> It was most fortunate indeed that this gentleman Mr. Schussler, chief engineer of the Spring Valley Water Company, was in the city, as he had planned and supervised the construction of all the larger mains and was able to locate them from memory alone, as all the charts had been destroyed in the conflagration. It was from his intimate knowledge, also, that he was able to send mechanics immediately to the various streets to stop the waste of water, which inevitably must have resulted had these pipes not been closed.

Funston on the extent of the disaster on the second day:

> By the night of the 19th about 250,000 people or more must have been encamped or sleeping out in the open in the various military reservations, parks, and open spaces of the city.

Greely on the extent of the disaster:

> The city telephone system was interrupted; every telegraph office and station had been destroyed. All the banks, deposit vaults, and trust buildings were in ruins. Not a hotel of note or importance was left standing. The great apartment houses lead vanished. Of the thousands of wholesale and large retail establishments scarce half a dozen were saved, and these in remote districts. Even buildings spared by the fire were damaged as to chimneys, so that all food of the entire city was cooked over camp fires in the open streets. Two hundred and twenty-five thousand people were not only homeless, losing all real and personal property, but also were deprived of their means of present sustenance and future livelihood. Food, water, shelter, clothing, medicines, and sewerage were all lacking. Failing even for drinking purposes, water had to be brought long distances. Every large bakery was destroyed or interrupted. While milk and country produce were plentiful in the suburbs, local transportation was entirely interrupted so that even people of great wealth could obtain food only by charity or public relief. In short, all those things which are deemed essential to the support, comfort, and decency of a well-ordered life were destroyed or wanting. The quarter of a million people driven into the streets by the flames escaped as a rule only with the clothing they wore. Thousands upon thousands had fled to the open country, but tens of thousands upon tens of thousands remained in the parks, generally in stupor or exhaustion after days of terror and struggle.

Greely on issuing tents, ponchos, blankets, and shoes:

> All warehouses and offices in the city were destroyed by noon of April 18, with supplies amounting to over $2,200,000. Recourse was at once had to the surplus quartermaster's stock at the Presidio, where fortunately, 3,000 tents were available, making it possible to relieve immediate distress and shelter many of the homeless. This shelter was later supplemented, especially during the torrential rains of April 23, by large issues (13,862) of ponchos and about 20,000 blankets, to protect the shelterless thousands, an action which relieved much distress and probably saved lives. Many refugees were without shoes, while the footgear of others was in a terrible condition from work among the debris of the fire. To relieve these, the army promptly issued 40,173 pairs of service shoes.

Greely on the duties he faced and on the condition of the fire and police personnel:

> … On my return on April 22, duties concerned the vaults in a burned area exceeding 5 square miles, containing titles, policies, bonds, gold, etc., to the value of hundreds of millions of dollars (in fact, the remaining personal wealth of San Francisco), but also matters of vital importance to the health and safety of the community. These duties involved the public relief of more than 300,000 persons for whom food, shelter, and clothing must be provided,…Bank vaults must be guarded, personal liberty respected, private property protected, physical suffering alleviated, public health preserved, and efforts taken to gradually turn the currents of thought and action from the terrible present to the normal conditions of the future…The only undisturbed and thoroughly equipped organization in San Francisco was the military forces of the Regular Army…The San Francisco firemen, noted for their efficient esprit de corps, were exhausted by continuous toil, overwhelmed by the enormous fire areas; many were destitute as to clothing and harassed by personal or domestic afflictions. The police department had similarly suffered from burned homes, scattered families…

Greely on providing food relief:

> …The most important duty devolving upon the army apart from the stopping of the fire was the formation and administration of an adequate system of relief for the homeless and destitute people in San Francisco. For the first few days the conditions were such that fully 350,000 persons had to be fed. San Francisco is particularly a city where food supplies are obtained from day to day, and the destruction of all the wholesale and large retail stores in the city left its inhabitants practically without food other than that provided by the army or brought from neighboring towns, and even these transfers were accomplished with extreme difficulty owing to the entire absence of local transportation. Conditions cannot be better emphasized than by the statement to me by a very prominent business man, a millionaire, that he was obliged to obtain his food for several days from the relief supplies, his family waiting their turn in line…The next day, April 24, a conference was held in my office and the situation thoroughly discussed. The

> Mayor, the Citizens' Committee, the national and local representatives of the Red Cross and the commanding general of the Department of California were present. They, one and all, unanimously advised me that the conditions were so urgent and desperate as in their opinion made it an imperative public duty for the army to assume charge of the issue of food supplies. … a force which, operating at first about 177 stations, finally aggregated 64 officers and over 5,100 enlisted men. Within twenty-four hours I was astounded by the report, based on estimates, that about 325,000 persons had been supplied food the first day.

Greely on transportation and provision of supplies:

> The most difficult problem, however, was that of local transportation, the entire system of street railways being entirely interrupted, teams scarce, and most streets impassable, so that floats, boats, pack trains, etc., had to be utilized. The demands of the army work alone necessitated two extensive corrals, where the quartermaster's teams during the greatest emergency numbered 228. When the civilian system of relief transportation was taken over by the army it necessitated an enormous increase of teaming under very difficult conditions, between the central depots and the distributing supply stations…on May 2, no less than 557 hired teams engaged in transportation. The quantities of stores handled by Major Devol in the four weeks beginning April 18 was enormous. They covered the receiving, unloading, transportation, and storage of the contents of 1,331 (railroad) cars, aggregating approximately 26,620 tons, and of 20 steamers with approximately 5,700 tons, making an average of 1,154 tons a day. Considering the conditions under which this work was done, it was a wonderful feat in transportation. To July 20 the freight aggregated 1,702 carloads.

Greely on communications:

> The entire system of local communication in the burned district was dependent on the military telegraphic lines until May 10. Captain Wildman established a military system of 42 telegraph offices and 79 telephone offices, which connected with all the military districts, the Federal buildings, the railroad freight offices and depots, the offices of the Mayor and Governor, and other important points. While no service can be called indispensable by itself, yet it may be said that the efficient transaction of most urgent public business, the relief of extreme destitution, and other remedial measures in San Francisco were made promptly possible through the system of military telegraph and telephone lines thus installed and maintained. The volume of business may be judged from the fact that a thousand messages a day were handled, many of great length. It was not alone the number of messages, but the saving of time which facilitated enormously the extended work in hand.

Greely on relief camps:

> On May 13 there were 50,000 people living in more than 100 separate camps...The most rigid supervision was exercised over military camps in which there were at different times 20,000 refugees, and a close eye was had on 25,000 scattered campers not under our supervision, and the 5,000 in temporary shacks. In addition to rigid daily inspections by the surgeons and commanders the camps were often visited by the officer in general charge of camps and his chief surgeon. The division inspectors kept close watch on the outside private camps. Careful attention was given to limiting fly infection by screening the kitchens and insisting on the use of gauze over all cooked food. Reed troughs were added in every camp, and in the larger camps odorless excavating machines were utilized. Facilities for washing, for bathing, and for laundry work were furnished as far as practicable. The tents were floored and daily ventilation and the exposure of the interior of the tents to sunlight were insisted upon. Provisions were made for the prompt transfer of all serious cases of sickness to selected hospitals so that the attention of the camp surgeons could be given almost exclusively to sanitary and precautionary measures. The daily report showed an average sickness of less than 3 per cent.

Greely on the Southern Pacific Railway:

> …Southern Pacific Railway for promptly handling and forwarding relief supplies to the exclusion of all commercial work, but from April 18 to 26 it carried free to points beyond Oakland 78,560 persons who were destitutes or refugees from San Francisco.

Greely on the people of San Francisco:

> This report would be incomplete if it did not recognize the sterling qualities of the people of San Francisco. Almost without exception these people suffered financially, varying from small losses to total ruin. It is safe to say that nearly 200,000 persons were brought to a state of complete destitution, beyond the clothing they wore or carried in their arms. The majority of the community was reduced from conditions of comfort to dependence upon public charity, yet in all my experiences I have never seen a woman in tears, nor heard a man whining over his losses. Besides this spirit of cheerful courage, they exhibited qualities of resourcefulness and self-respect which must command the admiration of the world. Within two months the bread line, which at first exceeded 300,000, was reduced to a comparative handful-less than 5 per cent of the original number.

The Committee of 50. The Committee of 50 moved quickly. Some of its members met on the afternoon of April 18, the day of the earthquake, in downtown San Francisco, but were chased by the fire up Knob Hill. The Committee began formal meetings the next day. Probably their most important decision in terms of the pace of redevelopment was the rejection of the Burnham plan. Daniel Burnham, an architect with a national reputation in city planning, had

been commissioned by prominent San Franciscans in 1904 to draw up a new plan for the city. The Burnham plan provided for parks, hospitals, monuments, a new civic center, a subway, some change in the street grid, and some new highways in surrounding areas. There was some support in the city government and within the Committee of 50 to use the blank slate of the post-disaster city to implement the plan. However, concern over the speed in which the plan could be implemented carried the day. Even if the title records had not been burned, assemblage of parcels would have been difficult because the city lacked the power to condemn property (Douty 1977. The Burnham plan was also opposed by the San Francisco Chronicle, the city's largest newspaper. The paper editorialized for speedy redevelopment.

In addition, the Committee did not strengthen building codes, despite the devastation from fire and the inability to prevent its spread. "When the subject of fire limits came up, [Freitag] brought out a plan for a certain zone within the fire limits which should contain nothing but incombustible buildings…This brought out unanimous protests in the committee, and the subject was dropped…The city had suffered from the greatest fire in history. Most of her industries were wiped out of existence, all business buildings were destroyed…streets wrecked,…and the transportation system destroyed. Comment on civic responsibility in the face of such conditions is mere froth. What San Francisco needs is the cheapest buildings possible in which business can be done, to ensure the community enough to eat" (Fradkin, 2005, p. 243). And, "The fire district of incombustible buildings was not significantly enlarged ... nor was the building code greatly strengthened… Rather than being prescribed by law, individual architects, engineers and their clients acted on their own to include or exclude safety features in new structures" (Fradkin, 2005, p. 244). [5]

To restore commercial activity as rapidly as possible, the Committee also waived building permits for one-story "temporary" wooden structures (which sometimes became two and three-story) in the disaster area. The majority of the major retailers erected temporary structures without building permits or retail licenses. And commercial and professional tenants were allowed to operate from private homes in residential districts. Finally, the Committee began debris removal immediately, with 7,500 men employed at this task by May.

Private Sector Response

With public order established, property secured, the relief effort coordinated, debris removal under way, and building codes and zoning relaxed, the stage was set for market forces to restore San Francisco.[6]The utility companies were privately owned and reacted quickly. Water, gas, and electric service were restored within the first month after the disaster. The re-establishment of the trolley service took the longest time, until the end of 1906. Damage to the trolley tracks had been extensive. The role of insurance companies was critical in the initial stages of redevelopment. Early on, agreement was reached among insurance underwriters to allow chimney repair to proceed in the first week after the fire, before properties could be inspected. By April 24 over 1,000 bricklayers were repairing chimneys in the disaster area (working chimneys were essential for indoor food preparation). There were only 400 bricklayers working in San Francisco before the fire, so there is early evidence of building trades willing to relax work rules in response to the disaster. But, the most important role of insurance companies after a disaster is the provision of funds to policyholders to enable rebuilding. Settlements with smaller policyholders began earlier, but by early June settlements with large policyholders were underway. There was uncertainty about the portion of losses that would be covered because

most policies did not cover earthquake damage and because the earthquake caused the fires. In addition in some cases, the portion of damage due to earthquake and due to fire was difficult to determine. A proposal to pay 75% of insured losses had traction early on among a majority of insurance companies, but "dollar for dollar" companies gained public notice in the press and by the Chamber of Commerce and a number of insurance companies were forced by competitive pressures to increase payouts. Eventually, 90% of losses were covered by the insurance companies, which included many foreign insurance companies(Douty, 1977; Stroppy, 2006). Thus, brand-name reputation coupled with the profit motive drove the market result to nearly cover losses specified by contract without lengthy periods of litigation. Funds would be available for rebuilding. Two thirds of insurance payouts were made in the 1906 calendar year.

Full banking services in San Francisco resumed one month after the fire. All of the commercial banks had burned but their cash deposits and securities were preserved in brick vaults. These vaults could not be opened, however, until two to three weeks after the fire, to avoid spontaneous combustion. Commercial banks in San Francisco served a small number of customers who typically had "large" balances. The Savings and Loan banks served a large number of small depositors, most with deposits under $500. In an attempt to avoid bank runs, the U.S. Treasury made $200 million in specie available to the banks through a clearinghouse bank established at the U.S. Mint in San Francisco (not burned by the fire) and allowed banks to open up "branches" there immediately following the disaster. Runs were feared because depositors would soon learn that specie, the major form money in circulation, was locked in the vaults which could not be accessed and because depositors might demand more "cash in hand" because of fear of bank failure (there was no deposit insurance) or to bridge the crisis. However, runs were avoided. One explanation for this was the destruction of account records which limited the ability of depositors to make withdrawals. The savings and loans used the loss of account records to slow withdrawals by requiring depositors to prove their identity and the existence of their accounts and to sign a promissory note for the value of the withdrawals. At commercial banks, where in most instances tellers knew their depositors from memory and their account balances, withdrawals were limited to $500. A second explanation for the lack of bank runs was the imposition of one month of bank holidays by California Governor Pardee, covering the period April 19 to May 19. This had the effect of postponing the due dates for contracts (postponing the clearing of checks) until the end of this period and reduced the demand for withdrawals. After the bank holidays both commercial and savings and loans resumed business, many in temporary structures built around their intact vaults.

The loss of municipal records of land titles was dealt with primarily in two ways. First, title insurance companies did a brisk business in reestablishing titles for a fee because their records were largely preserved. Second, state legislation was passed that allowed property owners to present evidence of ownership in court to gain title. The evidence would be maintained by the court to be used if the title was contested.

The pace of reconstruction was generally not slowed by shortages of material or labor (there were some transportation bottlenecks). With respect to materials, the question was not if materials would be available, but at what price?[7] Lumber prices increased the most of the building materials, roughly doubling in the first year of reconstruction, but falling after that (Douty, 1977). Skilled construction trades were unionized and the availability and cost of these workers could have presented problems for the pace of redevelopment. However, the building trade unions increased apprenticeship positions dramatically in the reconstruction period to meet labor demand (see table 1).

Table 1
Union Membership, Selected Building Trades, San Francisco, 1906-10

Trade	*January 1906*	*January 1907*	*1910*
Bricklayers	402	1806	400
Carpenters	3067	9802	5501
Hod carriers	389	1060	700
Electricians	297	653	400
Painters	1900	1800	1600
Plasterers	256	654	n.a.
Plumbers	512	955	600

Data collected by Douty (1977) from the San Francisco Chronicle and California Bureau of Labor Statistics.

Increases in membership in other building trade unions were less dramatic than those summarized in Table 1, but on the order of 50 percent in the first year after the fire. These included bridge and structural iron workers, outside electrical lineman, cement finishers, stone workers, roofers, and building material teamsters (Douty, 1977). The increase in trade union membership apparently held nominal skilled labor wage increases to 20% or less (see table 2).

Table 2
Indexes of Hourly Wage Rates for Bricklayers, Carpenters, Hod Carriers, Painters, Plasterers, and Plumbers, Selected Cities of the U.S., 1905-1910

City	*1905*	*1907*	*1910*
San Francisco	100.0	121.9	119.3
Baltimore	100.0	99.8	99.0
Chicago	100.0	109.7	119.8
Cincinnati	100.0	103.8	110.1
Los Angeles	100.0	100.1	100.2
New Orleans	100.0	111.1	113.3
New York	100.0	104.4	105.0
Washington, DC	100.0	103.1	n.a.

Data collected by Douty (1977) from U.S. Bureau of Labor Department bulletins.

All in all, by "August, 1906, the cost of erecting steel frame, reinforced concrete, cement, or brick buildings had risen by 10% over their pre-disaster levels, and the cost of woodframe buildings by 20%" (Douty, 1977, p. 222). However, by March, 1908, most of these construction cost increases had attenuated (Douty, 1977).

Rebuilding proceeded rapidly. In 1905, private building contracts had totaled $20 million. Private building contracts in 1906 (the disaster was in April), 1907, 1908, and 1909 were $39, $50, $35, and $30 million (Douty, 1977). The pattern of recovery of large retail establishments in downtown San Francisco is shown in table 3.

Table 3
Number of Large Retail Stores in Downtown San Francisco, 1906 – 1910, By Date

Date	*Number of Stores*
March 1906	45
July 1906	7
April 1907	8
April 1908	13
April 1909	24
April 1910	37

Data collected by Douty (1977) from newspaper advertisements.

In April 1910, the San Francisco Building Trades Council issued a special issue of its journal to commemorate the rebuilding of the city as a job well done.

Summary and Conclusion

A severe earthquake in San Francisco in 1906 severed electrical and gas lines and collapsed chimneys. Fires resulted, burning for four days over 2800 acres. The commercial and residential center of the city was destroyed. Two hundred fifty thousand people of the city's 400,000 in population were left homeless, including a majority of public and private sector workers. Municipal records of land titles and bank account records were lost. Payouts from property insurance claims, necessary for rebuilding, were in doubt because policies covered damage from fires, but not from earthquakes. The municipal government was corrupt. Yet, within three years the city was rebuilt, commercial activity restored, and the population level recovered. Two public sectors developments were key. The first was the actions of U.S. Army troops stationed outside the fire zone at the Presidio and Fort Mason. They moved to maintain order, protect property, and fight fires within hours of the earthquake. They patrolled the city for 74 days. These actions were extra-legal in that martial law was never declared. Army troops also built and maintained the communications network, took over the distribution of food and other supplies, and constructed and ran many of the relief camps. The second development was also extra-legal. The municipal government was displaced the day of the earthquake by a Citizens' Committee of business and civic leaders. This Committee would control local government funds, including $10 million in donations, and dictate or cajole liberal land use, zoning, business licensing, and building trade rules to speed redevelopment and build confidence in the recovery. Thus, the U.S. Army and the Committee set the stage for rapid redevelopment by maintaining property rights and a legal and administrative framework conducive to a robust private market rebuilding of the city. In a narrow sense, the uniqueness of the U. S. Army response and the displacement of the municipal government makes the San Francisco recovery not generalizable to other disasters. In a broader sense, however, the extraordinary San Francisco recovery echoes Hirshleifer (2008): "Historical experience suggests that recovery [from a disaster] will hinge upon the ability of government to maintain or restore property rights together with a market system that will support the economic division of labor."

Notes

[1] A 360° panorama of the disaster in photographs is available at: http://bancroft.berkeley.edu/collections/earthquakeandfire/panorama/panorama.html

[2] There were 8,000 deaths resulting from the Galveston Hurricane in 1900, less than 2000 deaths in New Orleans following Hurricane Katrina in 2005, and 300 deaths from the great Chicago fire in 1871.

[3] Refer to http://www.encyclopedia.chicagohistory.org/pages/645.html.

[4] President Roosevelt issued a second proclamation after the formation of the committee of 50 that designated the committee as the administrator of relief funds.

[5] Fradkin also has a thorough discussion of the risks inherent in the speed over safety strategy. A market response might be appropriate in the case of earthquake risk because a large portion of the costs of an earthquake are borne by the property owner; similarly, a large portion of the benefits of earthquake proofing go to the property owner. In the case of fire, however, external costs are significant.

[6] Boettke, et al. (2007) "The market economy, with the incentives and information generated by private property, relative prices, and profit and loss accounting, tends to coordinate the actions of economic decision-makers in a manner in which the gains from trade are realized and resources are allocated to their highest use. The political process does not have access to the information generated by the market process and actors within the political context face different incentives than those in the market."

[7] Market price increases after a disaster are sometimes criticized as gouging. But rationing by market price after a disaster serves at least three useful purposes: shortages are eliminated, goods are available for those who need them the most (rather than first come first serve), and producers are encouraged to expand supplies to the disaster location.

References

Boettke, P. J., Chamlee-Wright E., Gorder, P. Leeson, P. T., & Sobel, R. S. (2007). The political, economic, and social aspects of Katrina. *Southern Economic Journal*, *74(2)*, 363-376.

Douty, C. M. (1977). *The economics of localized disasters: The 1906 San Francisco catastrophe*. New York: Arno Press.

Fradkin, P. (2005). *The great earthquake and firestorms of 1906: How San Francisco nearly destroyed itself*. Berkeley, CA: University of California Press.

Greely, Adolphus W. (1906). San Francisco Earthquake and Fire. Special Report of Major General, U.S.A., Commanding the Pacific Division. http://content.cdlib.org/view?docId=hb1t1n98g0&doc.view=frames&chunk.id=div00001&toc.depth=1&toc.id=div00001&brand=oac

Hirshleifer, Jack. (2008). Disaster and Recovery. *The Concise Encyclopedia of Economics*. Library of Economics and Liberty. 17 February 2010. http://www.econlib.org/library/Enc/DisasterandRecovery.html

London, Jack. (1906). The Story of an Eyewitness. *Collier's*, May 5. http://london.sonoma.edu/Writings/Journalism/sfearthquake.html

Mill, John Stuart. (1909). *Principles of Political Economy*, http://www.econlib.org/library/Mill/mlP5.html.

Strupp, Christoph. (2006). Dealing with Disaster: The San Francisco Earthquake of 1906. U.C. Berkeley: Institute of European Studies. http://escholarship.org/uc/item/9gd2v192