

Performance insurance: rewarding managers for better service

Water utilities need to improve their performance in ways that are transparent and obvious to customers. **DAVID ZETLAND** explains how performance insurance can improve outcomes for customers, ease the workload on regulators, and reward good managers.

On 22 December 2008, the wall of a 84-acre (34 ha) solid waste containment area adjacent to the Tennessee Valley Authority's (TVA) Kingston Fossil Plant in the US ruptured in the middle of the night, spilling over a billion gallons (4.1 million m³) of coal fly ash slurry over 300 acres (120 ha), blocking nearby rivers, and depositing up to six feet (1.8 m) of toxic sludge on the land (Sohn, 2010). It was a minor miracle that nobody was killed. Although clean-up began immediately, it was not until August 2012 that a court ruled that TVA was responsible for the mess and would pay damages. In part, the ruling against TVA was based on reports that TVA had known about the problem since 2003 and had decided against taking action to strengthen the containment wall (Barker, 2009). TVA's decision saved it around \$5 million initially but cost it \$1.3 billion when the spill – the largest of its kind in US history – eventually occurred.

TVA, the largest public power utility in the US with 57 power plants and \$4 billion in revenues, said it would pay the damages – by raising charges to ratepayers (Watkins 2012).

That decision does not exactly represent the kind of justice most people expect. Some wanted TVA managers to be jailed for negligence, others hoped that TVA would pay damages out of its

'profits', but TVA – like most public utilities in the world – does not pursue a risk-and-reward, for-profit business model. Most utilities – whether investor or municipally-owned – set prices to recover costs. They refund revenues when costs are lower than expected and raise prices when costs increase. Utility managers target best practices in managing risks, delivering services and minimizing costs, but they modify practices to suit local conditions. They are allowed to raise prices to deliver normal services but warned against 'gold-plating' their systems. This process is meant to please two customers: a public that pays for services and a regulator who ensures that payments are appropriate for services delivered.

This three-way relationship involves tradeoffs. Customers do not get to choose their utility but they pay prices based on the cost of service. Regulators have the power to set prices but they depend on managers for operating and costs data. Managers rarely lose their jobs (or face going to prison) if they make operational or financial mistakes, but it is also rare for them to earn bonuses for delivering efficiency.

The good news is that this system has worked pretty well in delivering safe and reliable water. The bad news is that customers and regulators may not trust that managers are delivering the best services at the lowest prices. Events like the TVA flyash spill reinforce this sense of mistrust.



In a perfect world, we would see managers delivering value for money to customers pleased to pay more in the knowledge that they are receiving good services, and regulators with little to do except set standards and report success. In this article I present an idea of how to use 'performance insurance' to get closer to that perfect world, a world where the price of water reflects its risk-adjusted costs of delivery, customers accept rate increases, and managers are rewarded for running an efficient operation that neither its customers nor its regulators need to really understand.

Who knows what?

Economists say that someone has an 'asymmetric information' advantage over you when they know more about a transaction than you do. Examples are everywhere: the farmer knows where his eggs came from, the car dealer knows his wholesale price, the boss knows

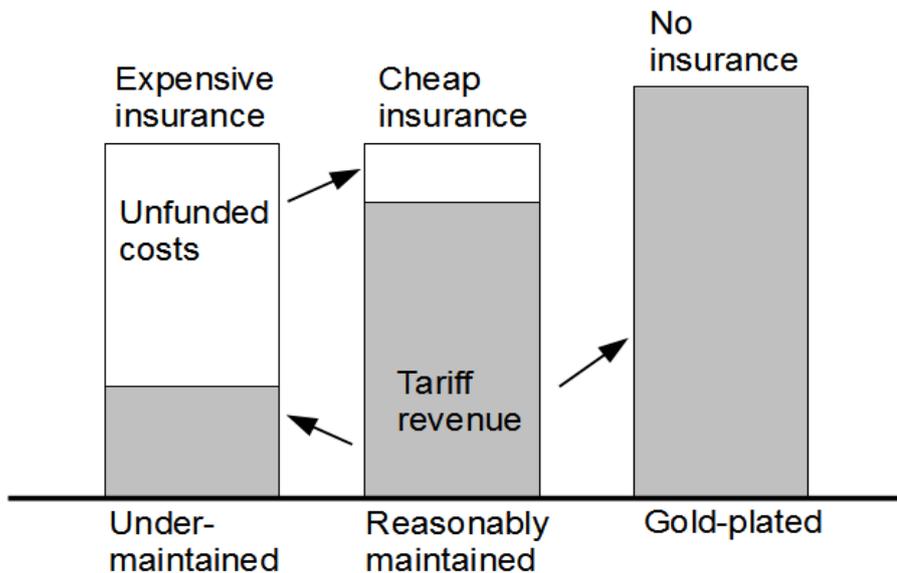


Figure 1: Insurance will reveal the shadow price of under- or over-maintenance

how much salary she can offer. People in asymmetric information situations who worry about trusting the other side adjust in a variety of ways, including inspection, competition, reputation, repetition and regulation. Inspection reveals physical properties; competition and repetition make it easier to establish a reputation that assures people they are getting what they expect. Regulation outsources inspection to a third party whose approval assures those who trust the third party's reputation.

It is easier to reduce asymmetric information problems when frequent transactions make it easier to match promises with results or when many people or organizations are involved. That is why we do not worry too much about the quality of the gasoline we put into our cars at brand-name or no-name gas stations. Gasoline is sourced from exotic locations at great distances and transformed from oil via complex chemical processes, but we pump without thinking because everyone is selling gas and everyone is pumping it.

Water utilities have an easier task – delivering clean water through piped networks using technologies that date back to the Romans – but this process is full of asymmetries. Water utilities are monopolies with customers, not competitive firms fighting for consumers with choices. Utilities may spend the correct amount of time, money and effort on delivering reliable safe water supplies, or they may spend too much or too little. If they spend too much, customers pay for gold-plated services they do not need. If they spend too little, customers pay

for avoidable damages. Customers will suffer much more if managers are lazy, corrupt or malignant, but customers can still suffer when well-meaning managers make operational errors or invest in the wrong capital mix (Zetland, 2011, chapter 7).

The sad thing is that some managers are indeed doing a good job, but it is hard to show that their low prices are the result of good work while others' low prices result from too little preventative maintenance.

In the summer of 2009, the people of Los Angeles experienced a wave of sudden and dramatic pipe bursts. Intersections were flooded, neighbourhoods were left without pressure, and sinkholes swallowed cars next to frightened bystanders (Zahniser and Willon, 2010). The Los Angeles Department of Water and Power (LADWP) – the largest municipal utility in the US with \$4 billion in revenues – could not explain to its four million customers why its rate of major pipe failures had doubled. The problems contributed to the October 2009 resignation of David Nahai, LADWP's General Manager, but his resignation neither fixed those broken pipes nor signalled a significant improvement in customer service – LADWP was ranked '13th worst in customer satisfaction' in 2011 (Ebright, 2009; CBS, 2011).

It turned out that LADWP had caused the problem with a June 2009 lawn watering ordinance that ordered customers to water their lawns on Mondays and Thursdays (Behrens, 2009). The resulting synchronized surges in system pressures put old joints under

enough strain to increase failures to unprecedented levels. An official inquiry placed the blame on LADWP in April 2010, and an August 2010 ordinance spread outdoor watering across six days (Zahniser and Willon, 2010; Behrens, 2010). City Hall regulates LADWP, but it was too busy to monitor 'professionals' and their watering schedules. The price of common sense falling between the cracks was borne by citizens, businesses and visitors to the City of Angels who were left with wet feet and a hefty repair bill.

As this example shows, water utility customers usually play a passive role of accepting the service they are given and paying what they are told. They rely on public officials (regulators or politicians) to hold water managers accountable for delivering good service at a decent price. These officials depend on the managers for information on how best to manage their operations, but they can also press for better performance. Customers, likewise, depend on officials for information on how best to oversee those managers, and they too can press for better performance. But there is a problem in this set-up: it is hard to know whether a problem can be blamed on someone failing to do their job or random bad luck.

It turns out that there is a very well developed business model for sorting out the difference between bad luck and bad performance: the insurance industry helps people bear the costs of random risks by collecting small, regular premiums from everyone and making large payouts to those unlucky enough to suffer damages from accidents. Insurance companies also make profits in this process, but they do so at the same time as they provide a useful service. It is in the process of maximizing their profits, interestingly enough, that insurance companies deliver an important side benefit: clear information on quality and performance. It is in this underwriting step that insurance companies can break the asymmetric information puzzle that plagues performance assessments of water utilities. That step will reveal the value of good management at the same time as it provides value to customers in the form of reduced costs from random accidents and shifting risks to insurance companies. Let us look at how insurance can improve conditions for customers, regulators and managers.

Rewarding performance and insuring against losses

The first thing to remember is that any insurance programme or policy needs to be directed at a concrete problem in which the mix of discretion and chance makes it difficult to separate good from bad management; see Mehlhorn and Hausmann (2012) for an example. There is no sense in insuring against events that are plainly managerial (e. g. , sexual harassment) or routine (e. g. , stormwater flows into a wastewater treatment plant). The best insurance policies are the ones that separate the two influences. Car insurance, for example, covers accidents but not speeding tickets. The premiums paid for car insurance depend on several predictive factors (age, previous accidents, car model, gender, etc.), and premiums fall when evidence of precaution (e. g. , 'safe driver') accumulates. Car insurance companies would love to give every driver a test, to further refine their risk pricing, but such tests are not cost effective when there are many drivers whose skills tend to average out based on observable variables.

Performance insurance for a water utility would be use the same general principles but account for clear differences. Some problems – water shortage or meter failure, for example – should not be insured, as they are, respectively, issues that are better addressed by managerial discretion and product warranties. Better candidates for insurance might be line failure or water contamination. Take line failure as an example:

Coverage for trunk line breaks that increase water leakage by more than some percentage and / or cost more than a minimum amount (the deductible).

Premium based on trunk piping length, connections, water source, pipe age, materials and past and current maintenance (see Wood and Lence, 2009).

Payment to cover the cost of repair – according to an average of several outside bids. A cap on total annual payments that reduces the insurance company's risk would lead to lower premiums.

Now those three factors omit several important elements. First, insurance companies must compete for this contract. No competition leads to a monopolistic price that will not improve on the current practice of self-insuring. Second, it may take time to develop a competitive market; regulators, customers, managers and insurers need to cooperate on sharing the

costs and risks of developing that market. Third, customers and regulators will only accept the cost of insurance if they understand that a short-term increase in their water bill will deliver long-term savings because repairs that would have been funded by higher bills will now be covered by the insurance company. Fourth, bills will fall in the long-term because managers now have a visible target to improve. Water systems everywhere suffer from line breaks, and managers everywhere put a 'shadow price' on the cost of those breaks by transferring funds – often on paper but sometimes in cash – to an account that pays for breaks. Managers need to estimate how much to transfer, and they may shoot high or low, but they will nearly always be pushed to minimize estimates, to reduce prices for customers. Such cost-containment – often pursued as a means of preventing gold-plating or waste – often reduces spending on preventative maintenance, capital upgrades, etc. It is not hard to find examples of penny-wise, pound-foolish policies that keep customer bills low in the short-term but inflate costs from 'unexpected' failures over the long-term. Figure 1 shows how two systems (on the left) may have different tariffs but the same total costs. The addition of insurance premiums to cover the costs will simultaneously reveal the true cost of service as well as which system is under-maintained. A gold-plated system (on the right) will not qualify for insurance (or will qualify for a trivial premium) because the risk of failure is so low – information that customers may use to restrain managers who may be more enthusiastic about shiny pipes or return on capital than value for money.

Ask anyone in the water utility sector in any country to name their greatest challenge and they will probably say 'full cost recovery', that is, collecting enough revenue to pay for adequate operations, maintenance, capital spending and resource management. The report card on the state of US infrastructure from the American Society of Civil Engineers (www.infrastructurereportcard.org) may be biased by its interest in building more stuff everywhere, but its D- grades for drinking water and wastewater systems reflect the fact that most water systems need substantial investment to meet performance targets.

Water managers who want to protect and upgrade pipes can point at this report card and ask for

higher prices, but it is hard for outsiders to know if their numbers are objective or biased (Hayek, 1945). Numbers based on an insurance premium will be more believable, not just because multiple insurers competed to submit a bid for covering line breaks, but because those insurers pay when breaks occur.

These numbers for the risk-adjusted cost of water service not just going to be more visible and accountable, they will also facilitate several information feedback loops. Both water managers and insurance companies will have a strong incentive to reveal as many details as possible about how they manage their system since clearer information will help insurers set prices accurately. The insurance premium, likewise, will make it easy for outsiders to understand that difficult-to-quantify goal of 'operational excellence' that existing performance benchmarking efforts (ib-net.org, for example) try to reveal. Underwriters who set insurance premiums will need expertise in water management, operations and engineering. They are likely to be retired water managers with years of experience, but they will also have the advantage of comparing best practices among different utilities. Such experience will make it easier for them to set accurate prices but it will also make it easier for them to suggest viable reforms based on practices that have been tested elsewhere.

Industry readers will probably have a few objections or doubts by now, so let me clarify a few loose threads. First, most water utilities already carry insurance against floods, fires, and so on. That means it is likely that insurance companies familiar with water utilities can offer this product and regulators will allow performance insurance premiums to be added to costs. Second, some utilities may already carry third-party insurance covering line breaks, water contamination, and other areas under discussion here, but I have not heard of any such coverage in my reading on utility operations around the world. Most utilities – like TVA or LADWP – appear to self-insure against these problems, but that 'solution' neither gives managers an incentive to minimize risks that ratepayers ultimately bear nor quantifies the implicit risk in current operating practices. Third, this idea requires that insurance companies – not regulators – assess risks and set premiums. Such a system will ensure that competing underwriters

receive penalties or profits in proportion to their accuracy. Contrast that outcome with the incentives that apply to regulators with job security and no competition (some regulators may fight this idea if they feel it reduces their power). Fourth, investor-owned water utilities and regulators need to agree on how insurance affects their return on operating expenses and capital investments, to ensure that actions increase profits and benefit customers. Now how would this information be used? Publicly-posted premiums would help citizens understand their bills while facilitating discussions of how managers are affecting the cost of service (tariffs plus premiums) over time. It would also be possible to compare premiums across utilities (with suitable adjustments) to get a better idea of their relative performance (Shleifer, 1985). These benefits must be weighted against the risk that insiders and outsiders put too much weight on public data at the expense of relatively opaque but important functions, e. g. , using resources to reduce premiums instead of answering customer calls. These costs and benefits can be debated, elaborated and extended, but the bottom line is that performance insurance can improve the cost-performance mix at utilities by adding another player – insurance companies – with a financial incentive to improve outcomes. Those companies will aim to make profits, of course, but the idea here – as with all insurance business models – is that those profits represent only a portion of the total value added from reducing risk, smoothing costs, and strengthening the link between management inputs and outcomes. Over time, managers will be rewarded for good performance and the ability to clearly demonstrate how prices (tariffs plus premiums) translate into better services for customers. Customers will see lower bills, better service, and price stability in the long-term. Regulators will have fewer details to monitor, a better measure of performance, and fewer ‘he-said, she-said’ rate hearings.

Great! How do I get started?

Any water utility can establish a performance insurance programme if its overseers allow. The key elements for success are a clearly defined policy (against, for example, line breaks of a certain size) and a reasonable number of insurance companies (five or more?) competing for business. It may be difficult to attract insurance

companies if they have little data to work with and / or a difficulty understanding the risk that they are covering. Their reservation may be surmounted by some promise to ‘share the burden’ of repairs in the first two to three years in exchange for a deduction of premiums. Alternatively, a regulator may require performance insurance of all its regulated utilities, thereby creating a market large enough to attract insurers. Customers may be persuaded to accept the additional cost of insurance if that cost represents a small portion of their bill and / or they are protected from rate increases for the first few years of operations. The main goal, as you can see from these comments, is to get the market going. Early adopters may not be so interested in incurring the costs of establishing an insurance mechanism unless they can be persuaded that those costs will deliver disproportionate rewards in the future – perhaps through some form of profit sharing with insurance companies and / or some reward from customers willing to support ‘cutting edge’ programmes that promise to save them money and improve their services. Managers have the most to gain from this idea. Performance insurance will make it easier for them to quantify and manage risk, reward them for good performance, facilitate rate increases that deliver operational value, and improve their relations with customers and regulators.

Note

I invite readers to respond to this idea with their own comments, questions or elaborations on its suitability and their own experiences with insurance, risk management, performance appraisal and connecting operational excellence to rate levels.

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