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TRADING WATER, TRADING PLACES: WATER MARKETING IN CHILE AND THE WESTERN UNITED STATES

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ABSTRACT: Growing demands for water traditionally are met by developing new water resources. Water resource managers typically grant new water rights until available water supplies are over-appropriated. In many parts of the world, however, water rights transfers are becoming more frequent as new water rights are increasingly difficult or impossible to obtain. Water markets are emerging in the western United States, where water rights more or less are freely exchanged. Many Latin American countries have sought to emulate this example. In particular, Chile is seen as a model where free market economic policies have been applied to facilitate the reallocation of water resources. The emergence of viable water markets depends on the existence of a number of conditions. These relate primarily to the predictability and transferability of water rights, the consequences for non-use, and the availability of alternative sources of supply. This paper presents the examples of Chile and the western United States legal and institutional frameworks for water resources reallocation. The two regions share many physical characteristics. Nevertheless, the water laws of Chile and the western United States present a stark contrast for comparison. The paper discusses both similarities and differences, and draws conclusions about the preconditions necessary for the emergence of viable water markets.
KEY TERMS: water rights, water marketing, comparative water law

SETTING

Western United States

The western United States covers a vast expanse of territory from the Rio Grande River to the 49th Parallel of Latitude and from 100th Meridian of Longitude to the Pacific Ocean. This is an incredibly diverse region, unified by its central, defining characteristic of aridity (Stegner, 1980). In many other respects, the western United States is an area of stark contrasts. The region generally is rural in character, yet most of its population lives in urban areas. Most of the region's water use is for agricultural purposes, although its largest new demands are for domestic use and for instream flows to protect and restore aquatic resources.

In the United States, the 19 western states encompass diverse subregions ranging from the desert areas of the southwest to the northern Great Plains to the high Rocky Mountains to the coastal rain forests of the Pacific Northwest. There are four great river basins: the Colorado, the Columbia, the Missouri and the Rio Grande, and the Great Basin of Utah and Nevada, which has no outlet. There are over 23 million acres (9 million hectares) under irrigation in the Colorado, Columbia and Missouri basins alone (High County News, 1987). Generally, and with the exception of the Pacific states west of the Cascade and Sierra Nevada mountains, they all share an arid climate.

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Chile

Chile too is primarily arid. The country is extremely long and narrow, extending approximately 2,700 miles from its boundary with Peru, at latitude 17 degrees, to the southern-most tip of South America at 56 degrees south latitude, and having an average width of only 110 miles. The climate is hot and dry in the north and becomes colder and wetter to the south. The nation's agricultural heartland is central Chile, characterized by Mediterranean seasonal conditions of hot, dry summers and cool, wet winters, which is highly productive when irrigated. Moving farther south, less favorable climatic conditions cause lower yields and force cultivation of lower-value crops, until agriculture gives way to livestock grazing and forestry in the southern-most regions of Chilean Patagonia.

Chile's total irrigated area comprises nearly two million hectares (approximately five million acres), including areas that are irrigated irregularly as water supplies permit. Private canals built before 1920 provide water for approximately 75 percent of Chile's irrigated land. The rest is watered by state projects built since then (Bauer, 1998b). Most irrigated land is used to grow grains, other annual crops, and pasture, with less than 20 percent dedicated to perennial crops such as fruit plantations and vineyards (Bauer, 1998a).

Since about the middle of the 20th century, Chilean agriculture has undergone profound changes. In north-central Chile, the country's most dynamic agricultural area, fruit plantations have expanded dramatically as the result of a boom in fruit exports. Nearly all of this expansion came at the expense of annual crops since there was very little new land to bring into production. Expansion of the export market also has resulted in modernization of agriculture, often including major investments in irrigation technology (Bauer 1998a).

WATER LAWS

United States

The water laws of the Western United States evolved in response to the aridity of the transmontane west. Each of the western states early on in its history adopted the common law of England as its basic legal framework (Tarlock, 1999; Friedman, 1973). As in England, the states established courts of law, which could provide damages, and of equity, which could fashion equitable remedies, including injunctive relief and special writs compelling governmental action consistent with the legally-protected rights of the applicant. The states merged their law courts with courts of equity beginning in the mid-19th century. Following the merger, most courts could fashion either legal or equitable remedies, as circumstances required (Friedman, 1973).

Western water law is at the same time a creature -- and a rejection -- of the common law. The common law doctrine of riparian rights was altered in states with mixed climates such as California, Texas and Washington, and rejected altogether in states such as Colorado and Montana that were wholly arid. Even in the rainy Pacific Northwest, however, the water laws of the states of Oregon and Washington evolved to facilitate development of the arid portions of each state. Thus, the western states generally rejected the common law of riparian water rights (Friedman, 1973). Instead, they fashioned a new common law suitable to their geographic condition. Western water law generally is embodied in the Prior Appropriations Doctrine, adopted by the western states to govern the allocation of scarce water rights between competing claimants. The Prior Appropriations Doctrine is similar in many respect to the laws of colonial Spain, but evolved independently (Beck, 1991). Most states codified the prior appropriations doctrine in the late 19th century. Contemporary water rights decisions are governed by more recent codes, together with judicial decisions that either interpret modern codes or expand upon traditional common law doctrines.

A water right in most western states is both a property right and a license to use the public waters of the State. Water rights are appurtenant to land on which water is beneficially used. Unless explicitly reserved, a water right passes to the grantee upon conveyance of appurtenant real property. Water rights primarily are state-created real property rights that provide their owners with a vested right to use water rather than a real property interest in the water itself (Tarlock, 1999).

Unlike riparian rights, appropriative water rights are considered independent property rights. Water rights may be transferred incident to the sale of appurtenant land or transferred separately. The owner of a water right also may transfer the purpose of use from one beneficial use to another. Likewise, a water rights owner may change the place of use or point of diversion. Finally, the water rights owner may sell or lease the water right to another user. Water rights may be transferred without losing priority if there is no injury to other water users. They also may be forfeited to the State for successive periods of nonuse.

Chilean Water Law

In contrast to the United States, the Republic of Chile has adopted a civil, or Roman legal system. In Chile, laws are created by the legislative and executive branches, and the judicial branch of government is subordinate to the others. The doctrine of stare decisis is inapplicable in Chile. Judicial decisions do not create binding precedents as in common law systems. Furthermore, there is a distinction between "private law," which deals with relations among individuals, and "public law," which deals with relations between individual citizens and the State.

Chile's water laws are a reflection of the nation's civil law heritage. Chile's water laws are embodied in its civil code, without embellishment by the judiciary. They have undergone radical changes since the Republic of Chile first adopted its Civil Code in 1855. The 1855 Civil Code defined the relationship between individuals and property. The code acknowledged forms of ownership over immaterial things, and stated that the holder of a usufructory right has ownership of that right (Bauer, 1998a; Merryman, 1978). Under the 1855 Code, the State granted licenses to private parties for the exclusive use of public waters. The licenses, however, were governed by public, administrative law, and could be administratively modified or cancelled without compensation.

In 1951, Chile adopted a comprehensive water code separate from the civil code. The nation's 1951 Water Code provided a system of water rights administration that was strikingly similar to those in most western American states. Under the 1951 Water Code, the government granted provisional water rights, governed by public, administrative law. Water rights became protected property rights, governed by private, civil law only after being put to actual use. A water right applicant was required to specify its intended use of the water, and certain uses were given preference over others (Bauer, 1998a). Water transfers were allowed only if the purpose of use remained the same. A change in purpose of use required a new water right (Ríos and Quiroz, 1995). The Direccion General de Aguas, or "General Water Directorate," (DGA), could cancel a water right if the owner did not use it for a period of five years (Bauer, 1998a).

By the 1960s, the fate of Chile's water laws became inextricably linked with economic conditions in the country generally. Chile had adopted an "import substitution" model of development in an attempt to protect the emerging working class during the process of industrialization. The State adopted a series of tariffs and subsidies for key industries, the byproduct of which was pervasive social and economic equality. Beginning in the 1960s, the government turned its focus on improving the welfare of Chile's marginalized population. The centerpiece of this effort was the controversial Agrarian Reform Law of Salvador Allende and his predecessor Eduardo Frei Montalva (Carrasco, 1995).

The 1951 Water Code was replaced in 1967 by a water code enacted as part of the Agrarian Reform Law. The purposes for Agrarian Reform were to expropriate and redistribute large landholdings to expand the class of small landholders and to encourage modernization of agricultural production (Bauer, 1998b; Jarvis, 1985; Jarvis, 1988). The 1967 Water Code was intended to empower new landowners to receive water as well. The law sharply increased state authority over water rights and was accompanied by a constitutional amendment declaring all existing water rights to be public property (Bauer, 1998b). The 1967 Water Code represented an attempt to redistribute water as a component of the government's overall agrarian reform policy.

In 1973, the Chilean armed services overthrew the Allende government. The military coup was a reaction to Allende's land reform efforts and to deteriorating economic conditions generally (Carrasco, 1995). The military government adopted radical free-market economic policies and curtailed the government's planning, regulatory and proprietary roles over private industry and natural resources development. A group of U.S.-trained, free-market economists known as the "Chicago Boys" gained unprecedented influence over efforts to rewrite Chilean laws to further the government's economic policy (Carrasco, 1995). The government's development model was export-oriented and open to the world economy (Bauer, 1998a).

In 1981, the Chilean military government adopted a new water code that reflected its overall economic and political objectives (Bauer, 1998b). The water code increased the legal security of private water rights, thereby putting an end to questions about water rights ownership left by the Agrarian Reform. The country's agricultural interests, who wanted to see the government encourage investment in irrigation infrastructure, pushed this objective. The government also sought to increase the productive value of water uses by relying on market forces to stimulate efficiency and the development of higher value agricultural products. Government economists argued that the real boost in efficiency would come from price incentives and private trading. According to the "Chicago Boys," market mechanisms would motivate users to save water in order to sell the surplus, and to transfer rights to higher-valued uses within agriculture or to other sectors of the economy.

In its final compromise form, Chile's 1981 Water Code declares that water is public property, to which the state can grant private rights of use. The Code also recognizes all rights granted or acquired under previous laws (Bauer, 1998b). Compared to earlier water codes, private liberties are extensive and state authority is constrained. Once

granted, water rights are fully protected as private property rights under the Chilean Constitution (CONSTITUCION POLITICA DE LA REPUBLICA DE CHILE art. 19(24)). Water rights under the 1981 Water Code are completely separate from land ownership. They are subject to the general system of real estate title registration and can be freely bought, sold, mortgaged, and transferred like other forms of real property.

The DGA grants requests for new rights free of charge whenever water is physically and legally available (Bauer, 1998b). Applicants for new rights no longer have to specify or justify their intended uses to the DGA. The agency has no discretion to deny such requests if there is water available, nor to decide whom among competing applicants will receive water (Bauer, 1998b). If there is not enough water to satisfy simultaneous applications, the DGA must hold a public auction and sell the new rights to the highest bidder (Bauer, 1998b; Water Code, DFL No. 1,122, arts. 141-50).

The DGA now has little authority over private water use, except during official drought emergencies. Rights-holders can freely change the location and use of water rights without administrative approval by the DGA (Bauer, 1998b). Unlike under earlier laws, they now have no obligation to use their rights and face no penalty or risk of cancellation for non-use. Once perfected, water rights are governed by private or civil law rather than public or administrative law. Consequently, the ordinary courts now have the adjudicatory powers over water use conflicts formerly exercised by the DGA (Bauer, 1998b; Water Code, DFL No. 1,122, arts. 177-85).

Under the 1981 Code, the DGA's functions primarily are technical and administrative. The DGA gathers and maintains hydrologic data, and keeps official registries of water rights and users' organizations. The DGA's investigatory role is limited to inspecting dams and other large water works. The DGA also prepares studies, plans and policy recommendations, none of which have regulatory force unless approved by other branches of government (Bauer, 1998b).

ANALYSIS

Comparing the Two Codes

Chile's water laws and those of the western United States are similar in many ways. Both countries have established permit systems as the exclusive basis to obtain a water right. In Chile, water rights may be obtained only by permit from the DGA. In the western United States, all states except Colorado have a formal statutory permit procedure for appropriating water (Beck, 1991).

Both Chile and the western states respect private rights to use water while retaining state ownership of the water itself. Both countries have constitutional protections against takings of private property without compensation. Both countries also recognize water rights as usufructory in nature, and they recognize a distinction between ownership of water rights, and ownership of the water itself.

Similarly, both Chile and the western states have rejected riparianism as the legal framework for water rights ownership. Only the western states, however, have adopted a system of prior appropriations. The western states allocate water based on a time-based priority system in which prior appropriators of water have a superior claim to junior water users. In Chile, water rights are divided into two classes, and the government equitably apportions water rights within each class (Ríos and Quiroz, 1995).

There are other differences. For example, western water users must show their water uses are for beneficial purposes, whereas Chilean water users do not. In fact, in Chile, once a water right is perfected, the owner may change the purpose of use without governmental approval. In contrast, many western states declare certain uses to be "beneficial," and require applicants to show the proposed uses meet these criteria. Furthermore, many states consider water transfers to be major state actions, often requiring the applicant to submit detailed environmental impact statements prior to approval.

Furthermore, water rights in the western United States may be lost as a result of nonuse. Under the common law of western states, water rights are considered abandoned if there is a successive period of non-use, together with intent to abandon the water rights. Many states also have enacted relinquishment statutes. In Washington state, for example, water rights are lost for five successive years of non-use, regardless of intent. By contrast, Chilean water rights are not subject to forfeiture.

Impediments to Water Marketing

Chile's water law was designed to encourage investment in irrigation infrastructure and to increase the productive value of water uses by relying on market forces to stimulate efficiency and the development of higher value agricultural products. In the United States, water transfers are encouraged because they tend to promote

greater efficiencies in agricultural water use and can be used to meet growing demands for water while avoiding many significant environmental impacts caused by developing new water supplies. In neither country, however, have, water markets fully met expectations. A review of the Chilean water code, and those of western states, will help to explain why.

Reconciling Public and Private Interests

In the western United States, most states have failed to reconcile competing public and private interests. Most states require water resources permitting agencies to make a finding granting a new water right application is consistent with the public interest inherent in state ownership of water resources. These same requirements often are applied to consideration for water transfer applications. The problem is that applicants cannot always predict whether the agency will determine that a particular transfer is in fact consistent with the agency's determination of what constitutes the public interest. The states are struggling to apply subjective public interest public interest considerations when making decisions on proposed transfers. Lack of objective criteria to balance public and private interests in water makes decisions about water transfers unpredictable and has a chilling effect on the emergence of water marketing.

The increasing need to consider environmental values has increased uncertainty about the availability of water rights to meet future demands. Furthermore, most western states have failed to reconcile private ownership of right to use water with public ownership of the water itself. Their failure in this regard creates tremendous uncertainty about the extent to which the rights can be transferred. This unpredictability inhibits the emergence of functioning water markets.

Disjunctive Surface Water and Groundwater Management

Western states historically have treated groundwater and surface water as separate resources. Commentators, however, have consistently called for integration (Tarlock, 1999). Many western states are moving to integrate laws relating to groundwater and to manage surface and water resources conjunctively. Colorado courts always have presumed groundwater to be tributary to surface water resources, and the Washington Supreme Court recently recognized theories of hydraulic continuity to protect surface water resources from groundwater exploitation. New Mexico courts also have protected surface water rights from groundwater development impacts. (Tarlock, 1999).

Chile distinguishes between surface water rights and groundwater rights, and between consumptive and non-consumptive uses. In Chile, the greatest single impediment to the emergence of active water marketing seems obvious to an outsider, and that is the Government's continued willingness to grant new groundwater rights. Until Chile recognizes the continuity between groundwater and surface water, new users will continue to seek new water rights. Groundwater levels will decline and will adversely affect surface water flows and impair the rights of surface water users. Water markets will remain stagnant, no matter how conducive the legal system might otherwise be to reallocation.

Relinquishment

The legal consequences for non-use of water have a significant impact on the success of water marketing. Chile and the western United States have arrived at opposite conclusions, both of which tend to reduce the likelihood active water markets will emerge in either country. An appropriate relinquishment statute would provide both a carrot and a stick. Chile's approach, particularly in the context of publicly-owned water, removes the possibility of encouraging users to transfer reserved water and leads to hoarding. Conversely, demanding a short period of non-use, such as the typical western state's five-year relinquishment statute, promotes water use for its own sake, merely to avoid relinquishment, and leads to the inefficient use of water. The statute also adds to uncertainty about water ownership, for a Water Right Certificate issued by the State cannot be relied on as evidence of a valid water right.

Conflict Resolution

Both countries now provide a legal system that, each in its own way, provides legal recourse for a water right holder to protect against injury by junior appropriators, and against arbitrary or illegal governmental action. The 1980 Chilean Constitution provides a new form of remedy, called the "recurso de protección," to protect private property rights that is similar to the ability of American courts to fashion injunctive relief and equitable remedies (Bauer, 1998a). American courts, however, have a longer history of exercising equitable powers, and tend at times toward judicial activism. Conversely, Chilean courts historically are reluctant to rule on substantive matters, especially when one side is another branch of government (Anderson and Grossman, 1988).

Transaction Costs

Finally, there are a number of bureaucratic shortcomings that manifest themselves as transaction costs. In many instances, these can prove prohibitive. First, there are costs and time delays associated with obtaining transfer approvals. Many states have experienced significant permitting backlogs, and until recently have processed both water transfer and new water right applications in the order received. Second, there often times is a paucity of information about ownership, and about hydrologic and ecological considerations. Applicants are required to pay to collect streamflow data and to develop elaborate computer models to estimate impacts. Information collected by government agencies at times is sporadic and almost always hard to find.

CONCLUSION

Both the western United States and Chile are examples of how reallocation of existing water rights can help meet growing demands for water in predominately arid regions. As we have seen, however, there are a number of preconditions that are necessary for water markets to flourish. Many, most importantly private ownership of water rights and the ability to separate ownership of water from ownership of land, exist in both countries. Other preconditions are missing from one or the other country, or both. According to a leading scholar on the subject, Chile's water code, at least theoretically, allows unregulated speculation in water rights (Bauer, 1998b). Yet the very provisions that allow for speculation also allow for hoarding of water rights. Conversely, in the United States, relinquishment laws are in many cases too restrictive, and lead to tremendous inefficiencies and uncertainty about water rights ownership rather than an incentive to use water more efficiently or to transfer water rights to someone who will.

Some commentators suggest the Chilean water code has failed to meet expectations as a model of free market trading in water (Bauer, 1998a). Others disagree (Ríos and Quiroz, 1995). True enough, there are far fewer transactions than many thought would be the case, and the transactions that have occurred have failed to bring about substantial increases in water use efficiency. The transfers that have occurred, however, have enabled Chile to move to the forefront of a growing international market for high-quality, high-value agriculture products.

In the United States, the western states are moving to promote reallocation of water resources. Critics and proponents generally agree the Prior Appropriations Doctrine and government regulation have evolved in ways that discourage conservation and provide disincentives for efficient water use. Some commentators suggest that, with the possible exception of water quality, reallocation of existing water supplies is the most pressing matter facing the arid West (Beck, 1991). Pressures over reallocation of water are a reflection of increasing concern about urban growth and declining environmental quality. Many see reallocation of water as the only means by which those of us who live in the Western United States can accommodate the tremendous growth and unprecedented economic prosperity we have witnessed in the last several decades without despoiling the quality of life that brought us to the Great American West in the first place.

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