ISSN-0734-9165

IMPACT ASSESSMENT BULLETIN

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VOLUME 10, NO. 3 Pages 84

International Association for Impact Assessment

PERCEIVED RISK AND NUCLEAR WASTE IN NEVADA: A MIXTURE LEADING TO ECONOMIC DOOM?

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INTRODUCTION

The state of Nevada, with funding provided by the U.S. Department of Energy (DOE), has been conducting and directing a multimillion-dollar socioeconomic research project over the past five years to assess the potential economic impacts to the state if the Yucca Mountain site is developed as the nation's first high-level radioactive waste repository. Through a research framework that includes questionnaire, survey, case study, and literature review methods, a national team of state-funded researchers has predicted that "the development of the [Yucca Mountain] repository could have a profound effect upon the economy and quality of life of people of the region (Technical Review Committee, 1990)." Further, in the December 1991 issue of Risk Analysis, state researchers reported that "...our analysis indicates that the development of the Yucca Mountain Repository will, in effect, force Nevadans to gamble with their future economy. The nature of the gamble cannot be specified precisely, but it appears to include credible possibilities (with unknown probabilities) of substantial losses to the visitor economy, the migrant economy, and the business economy" (Slovic et al., 1991; see also Bassett and Hemphill, 1991). In July 1992, the Nevada Nuclear Waste News, published by the Nevada Nuclear Waste Project Office, featured an article, "Nuke Waste and Nevada Real Estate: How One Could Haunt the Other," which stated, "Over time, it is possible that Nevada or Las Vegas will become increasingly associated

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with images from the nuclear dump. This could degrade the image of the state and the city and reduce the probability that tourists will visit, workers and retired people will in-migrate, and businesses will relocate in the affected areas." Perception-based adverse impacts in Nevada would result from the mechanisms of public perceptions of risk, social amplification of risk, and intense negative imagery leading to stigmatization.

This article raises the issue of timing. When will the investment community's activities reflect a concern for the potential adverse economic impacts that state researchers expect the repository may produce? When will sufficient radioactive and nuclear images that evoke pervasive dread, revulsion, and anger become associated with Nevada and stigmatize the state as a "nuclear dump state" (Flynn et al., 1992), thus deterring future economic growth? Economic information used by private and corporate investors to make current capital investment decisions are reviewed in an initial search for signs of adverse short-term and long-term economic consequences that are directly attributable to the repository and its negative image.

When assessing the perception-based impacts of a repository, the researchers need to investigate alternative methods, approaches, or audiences that might be used to examine the extent and dynamics of a link between (1) the images and preferences expressed by survey respondents and (2) the behavior of the investment community. To make their case for possible economic consequences from repository-related stigmatization, state researchers rely on intent and word-association image surveys to predict preferences for vacation sites, job and retirement locations, and business sites. On the other hand, current investment strategies relating to Nevada gaming stocks reflect expectations about what could occur in the future and they take into account investor perceptions of societal change in risk attitudes and nuclear images that may evolve over a decade of site characterization.

NEVADA'S GROWTH

The state of Nevada continues its five-year reign as the fastest growing state in the nation in terms of job growth. The dynamic demographic and economic growth that occurred in Nevada during the 1980s appears to be carrying into the 1990s in a strong fashion, though the current reduction in visitors and gaming revenues has shown the state's vulnerability to a national recession. Nevada's growth has been fostered by a combination of three separate, but interconnected, economic factors: (1) a relocation and expansion of finance, telecommunications, and insurance companies from neighboring states to Nevada; (2) a resurgence in retiree settlement in the southern Nevada area; and (3) a continued growth in tourism and full-fledged casino gaming throughout the state. These economic factors have in turn generated additional job growth in the state, though disproportionately spread among the real estate, public utility, trade, transportation, and government sectors.

Nevada has been able to capitalize on the economic, social, environmental, infrastructure, and regulatory problems of southern California in sustaining its own growth. Nevada also provides internal economic stimulus through low taxes (the lowest in the nation, with neither a personal income tax nor a corporate tax); regulatory moderation; land available for development; low-cost electricity; and inexpensive housing. Las Vegas is actually becoming both a business and recreation suburb for southern California. However, planned large defense industry cutbacks with military base closures and industry realignments in southern California potentially could have both an adverse impact on the visitor economy of Nevada and a positive impact from additional businesses and retirees fleeing California's economic problems in the near future.

The powerful demographic and economic growth in Nevada during the last decade was achieved during a time when the state was confronted with a number of local, national, and international challenges, as well as some very public issues. Nevada and Las Vegas growth has withstood several external adversities stemming from the national economic recessions, the devaluation of currencies in foreign countries, the Persian Gulf war and related fears of terrorism, the legalization of casino gaming in eight states and on the Mississippi River, the increased gaming on federal Indian reservations, the occasional high transportation costs and gasoline shortages, foreign visitor concerns following the Los Angeles riots, and the advent of airline hubs that reduced the number of nonstop flights to Nevada.

Also worth noting is the persistence of this economic growth despite 40 years of proximity to the 1,350-square-mile Nevada Test Site, a nuclear testing facility located 65 miles northwest of Las Vegas. Operations at the Nevada test site have included the explosion of more than 700 nuclear devices since 1951 (12 to 15 detonations per year, with many rattling buildings in Las Vegas); the detection of extensive pollution from hazardous materials used and stored at the site; the irradiation of more than

3,000 acres of land exposed to atmospheric testing in the 1950s; the operation of a liquefied-gaseous-fuels test facility; the construction of nuclear device assembly and warhead dismantling facilities; the temporary storage of nearly 1,700 containers of plutonium waste; and the possible placement of a nuclear-powered rocket project. State and local officials and politicians are promoting a continuation of underground nuclear weapons testing at the Nevada Test Site because 9,000 jobs are generated by the facility and the $1 billion DOE nuclear testing program is considered vital during a time of growing world disarmament. Clark County once promoted its affiliation with the Nevada Test Site by displaying a large mushroom cloud on its official seal in the 1950s.

Various other area events and facility operations also occurred in Nevada with great notoriety. Among these were a devastating casino/hotel fire in Las Vegas; the operation of a low-level radioactive and hazardous waste disposal facility in Beatty; both a major industrial explosion and a toxic gas release in Henderson; the Air Force supersonic test flights of stealth aircraft and live munitions training at the Nellis Gunnery Range; and the forecasted outstripping of available area water supplies for Las Vegas by 1995. Finally, fears of potential significant adverse socioeconomic impacts resulting from negative imagery of a nuclear waste dump are raised by the State of Nevada through the media in response to Congress selecting, in 1987, Yucca Mountain for site characterization under the Nuclear Waste Policy Amendments.

SITING OF THE REPOSITORY AND INVESTIGATING SOCIOECONOMIC CONCERNS

During the 1980s, in tandem with Nevada's rapid growth, there was a simultaneous paring down of site location options by DOE for the placement of an underground repository capable of containing 70,000 metric tons of civilian high-level radioactive waste for 10,000 years. The Nuclear Waste Policy Act of 1982 initiated a national search for a suitable repository site and, in 1983, Nevada's Yucca Mountain Site (100 miles northwest of Las Vegas) became one of nine potential sites under consideration. After a site ranking in 1984, it became one of five potential sites and, in 1986, it was one of three sites recommended to the President as suitable candidate sites for characterization. With the passage of the Nuclear Waste Policy Amendments in 1987, Nevada's Yucca Mountain Site was designated as the sole site for characterization to determine site suitability for the repository.

The state of Nevada, with funding provided by DOE, has developed a research framework to investigate the socioeconomic consequences to Nevada if the state were to become the host of the nation's first high-level radioactive waste repository. A national team of state-funded researchers has predicted possible significant negative impacts to various economic sectors at risk in the state as a result of associated stigmatization of southern Nevada as a "nuclear place" if Yucca Mountain is developed as the repository location (NWPO, 1989). The state of Nevada Technical Review Committee (TRC), in reviewing the studies by the state's researchers, concluded in the Interim Statement of the Technical Review Committee on the Yucca Mountain Socioeconomic Project (Technical Review Committee, 1990), that "from the evidence now available, it appears that the designation of Yucca Mountain as the site of a repository has already had significant socioeconomic impacts on Nevada, and that, depending upon numerous decisions not yet made by federal, state, and local agencies as well as public reactions to future events, the development of the repository could have a profound effect upon the economy and quality of life of people of the region. This conclusion arises in part from observation of the effects on the political and social fabric of Nevada over the fourteen years since investigations commenced at Yucca Mountain, and in part from emerging findings related to public perceptions of the risks of waste transportation, storage, and disposal."

However, in an analysis of the responses from several word-association surveys, state researchers found that presently the nuclear test site has worked its way into the imagery of Nevada for only a small percentage of people and, further, that it is rarely associated with Las Vegas, located 65 miles from the site (only two images out of more than 1500 elicited) (Slovic et al., 1991). This recognition appears to be changing as the test site is "riding its own surge of popularity with tourists" – the number of visitors participating in regularly conducted DOE tours has more than doubled from 1991 to 1992 (Reardon, 1992). Recent studies have shown that the proposed repository at Yucca Mountain has not yet infiltrated the public's image of Nevada (Slovic et al., 1991), even though state and national media have provided coverage of the controversial issue and program and DOE is conducting site tours. A recent million-dollar nuclear-industry ad campaign and the ensuing political controversy have heightened the repository issue within the state. Currently, state researchers have not stated or concluded that imagery effects in Nevada and Las Vegas as a result of the siting process or site characterization have definitely occurred.

TIMING OF POSSIBLE NEGATIVE, ATTRIBUTABLE IMPACTS

If the conclusion that intense negative imagery from the repository or future repository-related events could occur and cause significant socioeconomic impacts on Nevada is correct, notable changes should be readily apparent in the investment strategies of private and corporate decision-makers toward state and local businesses at risk. These changes would involve a redirection, reduction, or elimination in the investment of large amounts of capital within the state, especially in Clark County and the Las Vegas area – the economies most vulnerable to negative imagery. Other things being equal, the investment community's concern for possible significant adverse impacts would be revealed through, for example, a decline in stock prices or corporate earnings for those tourist-dependent businesses situated within Nevada; a reduction in the state's job-growth rate; an aversion to expand or open large new hotel or casino gaming facilities within the state; a tightening of lines of bank credit to area industries, thus inhibiting their expansion; a shortening in the payback time period calculations; a shift of manufacturing and finance-insurance-communication service sector industries to other regional geographic locations; and a reduction in large, master-planned residential developments for retirees.

At the present time, there does not appear to be any substantive evidence or indication from within the investment community of significant perception-based adverse impacts beginning within Nevada's economy as a result of the repository siting process or site characterization. If present, the adverse impacts or impairments would be most visible in the economics of Nevada's full-fledged casino gaming industry, which is highly image dependent and vulnerable to tourist perceptions. To search for any initial signs of adverse economic impacts due to perceptions, the following four indicators of financial strength within the casino gaming industry are reviewed:

1. gaming revenues,
2. visitors to Nevada,
3. capital expenditures, and
4. casino stock ownership.

Visitor and financial data regarding the viability of Las Vegas casinos and customer attraction to casino entertainment are available from sources such as casino industry annual reports, the Las Vegas Convention and Visitor Authority, the State of Nevada Gaming Control Board, Standard and Poor's Corporations Standard New York Stock Reports, Value Line Reports, and the First Boston Corporation.

The casino gaming industry within the United States is a growth industry with casino- based demand related to an increasing national social acceptance of gambling. Growth in the Las Vegas gaming market has been assisted by that location's long-standing reputation as a high-end recreation resort and business convention center destination. Casino gaming has been enhanced by strong area and state support through the expansion of the Las Vegas Convention Center, a strong nationwide advertising campaign, and the upgrading of the city's McCarran International Airport. The state also maintains control over casino expansion outside the state by local casinos, a "foreign-gaming approval" must be obtained from state regulators under current Nevada law. The casino industry in Las Vegas, recognizing a wider market necessary to support its continued growth, has already begun broadening its appeal to the mainstream tourist as a premier vacation destination with "must see" or "monument" entertainment attractions.

GAMING REVENUES

Nevada's casino gaming revenues (approximately 67% of casino net revenues) are a barometer of the industry's and the state's success in attracting customers to their facilities, in their ability to adjust to gaming market changes, and in dealing with the regulatory climate toward gaming. Nevada gaming revenue growth is still expected to effectively compete with the continuing proliferation of various forms of legal gambling in new jurisdictions throughout the United States. Important factors in attaining gaming revenue growth are the proper targeting of customer market segments, the optimum mix of table games and slot machines, and the favorable regulatory climate. The number of gaming facilities in Nevada with annual net revenues of at least $1 million has risen dramatically from 169 facilities in 1989 to 182 facilities in 1990, with Las Vegas as a major contributor to that number (Standard and Poor's Corporation, 1991b). Casino profits can be greatly affected by the degree to which complimentaries are used, national and international marketing offices are needed, and provisions for doubtful accounts are required.

During the 1980s, Nevada gaming revenues advanced at a 9% compound annual rate, according to the State of Nevada Gaming Control

Board, out pacing the 7.6% rate of the national economy (Standard and Poor's Corporation, 1991a). In 1990, Nevada gaming revenues were almost $5 billion, experiencing a major 14.1% increase over 1989 gaming revenues (Standard and Poor's Corporation, 1991b). Projections for gaming revenues during the 1990s are expected to be in the 8% to 10% range and once again significantly exceed the gross national product, according to industry analysts (Circus Circus Enterprises, Inc., 1991; Standard and Poor's Corporation, 1991b). Gaming revenues are reflecting some effects of the 1991-1992 recession; the extent of these effects is currently unknown, although casino winnings between October 1990 and October 1991 were down 6% statewide and 12% in Las Vegas (Reinhold, 1992).

Proper targeting of customer market segments is crucial to the economic health of both a casino and to the region. Las Vegas ("The Strip" and the downtown "Glitter Gulch") accounts for approximately 60% of state gaming revenues and had a compounded gaming growth rate of 10.8% between 1985 and 1990 (Standard and Poor's Corporation, 1990). Part of the success of the Las Vegas casinos is that they, as a whole, target the entire range of potential gamblers, including high rollers, conventioneers, resort vacationers, mainstream tourists, casual visitors, retirees, and local residents. Las Vegas casinos also use large sports extravaganzas, headliner entertainment, Broadway and cabaret shows, and theme entertainment as attractions. While gaming revenues for Nevada have been increasing, the sharing in those revenue gains among regions within the state has not been equal; some area growth has been at the expense of another area's market share. For example, the downtown Las Vegas casinos have been losing market share to casinos in Laughlin 90 miles south. Both downtown Las Vegas and Laughlin cater to older, more casual, middle-income clientele, who often arrive in recreational vehicles and on buses. Laughlin experienced a 21% revenue growth rate between 1985 and 1990 and commanded 7.4% of state gaming revenues by 1990 (First Boston, 1991). Downtown Las Vegas casinos are becoming less competitive as older downtown properties are not refurbished and new properties are developed elsewhere.

Gaming revenues are derived from a mix of sources, primarily slot machines and table games. Slot machines, with greater video diversity and linked progressive jackpots, are responsible for an ever-increasing share of gaming revenues – now about 60% of total Nevada casino winnings, up from 40% a decade ago (Circus Circus Enterprises, Inc., 1991). In the Las Vegas Strip area, with a strong reliance on high rollers and convention groups, slot machines account for 40% of casino winnings. Casinos that rely on high roller clientele and table games for revenue experience great revenue volatility due to the small number of participating players, large amounts typically wagered, increased pressure to raise the amount of credit play allowed, uncertainty of collecting on doubtful outstanding accounts, and wide fluctuations in the win percentage. Neighborhood casinos, which target the growing, repeat local or resident crowd, seek a steady revenue as indicated by studies that show 60% of all households in Nevada have at least one person who gambles, with 58% of those people visiting a casino once a week and spending between $25 and $50 (United Gaming, Inc., 1990). These local residents continue to make a sizable contribution to state gaming revenues, and the population within 100 miles of Las Vegas contributes an estimated $250 million to the gaming revenues of Clark County (First Boston, 1991). Casinos that favor the middle-income customer emphasize value buying with a diversity of slot machines, low-limit jackpots, and keno. Casinos are quick to adjust the gaming mix according to the targeted consumer demand, competition, available technologies, marketing expenses, credit demands, complementary costs, and revenue generation expected per square foot.

A major consensus exists in the casino industry about the potential adverse effect of a pending change in the federal regulatory climate toward gaming. Revenue losses could occur as a consequence of proposed new currency transaction reporting regulations stemming from the United States Department of the Treasury tentative 1988 amendments to the Bank Secrecy Act. The Act, originally enacted in 1985, requires banks, other financial institutions, and casinos to monitor receipts and disbursements of currency in excess of $10,000 and report them to the Treasury. The tentative amendments to the Act apply solely to casinos, lowering the reporting threshold to $2,500. Casino management believes that such a tightening would result in a further reduction in the volume of play by upper- and middle-level wagers as indicated by evidence from the imposition of the $10,000 limit set in 1985. The tightening would also require extensive record-keeping and thus add to casino industry operating costs, therefore the industry is allied against the pending change.

VISITORS TO NEVADA

Visitors to Nevada are the key to the state's economy. In an effort to understand and anticipate changes in the customer client base, Nevada maintains a host of visitor statistics. These statistical data include information pertaining to visitor age and origin, mode of transport, spending habits, length of stay, and frequency and purpose of visits. With the exception of the 1981-1982 recession period, the decade of the 1980s was one of upward visitor counts for the state.

Las Vegas achieved an overall 4.5% compounded visitor growth rate during the 1980s and reached 18 million visitors in 1989, according to the Las Vegas Convention and Visitors Authority Profile, 1990 Summary (1991). During the 1980s, convention attendance doubled to 1.5 million by 1989 as a result of the 711 trade shows, meetings, and conventions held in Las Vegas. During that decade of continued visitor growth, not one all-new full-fledged casino/hotel was opened in Las Vegas. With the opening of two spectacular "must-see" casinos/hotels (the Mirage on November 22, 1989, and the Excalibur in June, 1990) within seven months of one another, visitor numbers for the Las Vegas area in 1990 increased by 12% to an estimated 20 million, and the number of conventions totaled 1,011, reflecting a 42% increase (Las Vegas Convention and Visitors Authority Profile, 1991). Expectations are that visitor counts for Las Vegas will continue to grow by perhaps 5% in 1991 and 3% to 5% per year thereafter (First Boston, 1991).

The origination points of visitors to Nevada fluctuate due to national and international economic, transportation, and political difficulties, as well as attraction strength. Before the opening of Atlantic City to full-fledged casino gaming in 1979, the East Coast (east of the Mississippi) accounted for over 12%, or 1.4 million, of the visitors to Las Vegas (First Boston, 1991). While the percentage dipped to 4% by 1986, the East Coast provided around 9%, or 1.6 million, visitors in 1989. The Midwest has supplied a fairly stable share of visitors, averaging around 16% during the 1980s, with the actual number rising by almost one million visitors. The West has provided over half of all visitors (57% in 1980 and 52% in 1989), with the actual number of visitors increasing by 2.6 million. Foreign visitor attendance declined to around 4% in the mid-1980s, but had doubled by the end of the decade. Visitors are staying longer at Las Vegas hotels – an average of four nights as opposed to three nights during the early 1980s. This has worked to maintain a high occupancy rate despite the development of additional room capacity (First Boston, 1991).

Las Vegas is situated at natural interstate crossroads between several strong regional markets. This accessibility is vital in maintaining a high visitor volume. McCarran International Airport has developed into a world-class airport with a growing number of direct scheduled and charter flights and is now an airline hub. Las Vegas, though, has seen the expansion of Laughlin draw off an increasing number of its western visitors due to greater market proximity. Laughlin has been able to effectively compete for clients of the older downtown Las Vegas casinos. Of Laughlin's 3 million visitors, approximately 82% are from the West (First Boston, 1991). Laughlin visitors are older, prefer the warmer winter weather, select the laid-back and low-roller casino style, and rely to a large extent on buses and recreational vehicles. Many visitors rely on campgrounds in Bullhead, Arizona, and take shuttle boats across the Colorado River to gamble for the day. The expansion of the Laughlin Airport will further increase and broaden the customer competition between Laughlin and Las Vegas.

Las Vegas casinos, in general, are strongly pursuing a fundamental customer shift from the heavy emphasis on high rollers in the 1960s to a more middle America market. This shift is helping to bolster the non-gaming revenue of the city and the area as families sightsee around the region. An ongoing national growth in casino demand, fueled by the increasing number of post World War II affluent baby boomers who are just beginning to enter the age groups that gamble the most, continues to fill Nevada's visitor demand (First Boston, 1991). Families in the West also are looking for new attractions that provide value-based entertainment. The casino/hotel industry is highly competitive, with each facility seeking not only to gain an advantage over another, but also to gain from another's advantage.

CAPTIAL EXPENDITURES

Nevada, and specifically Las Vegas, casino/hotel owners continue to invest heavily in their capital facilities to attract visitors, providing sleeping accommodations, casino square foot capacity, retail stores, restaurants, parking garages, and entertainment attractions. The casino/hotel owners have expanded existing facilities, refurbished older facilities, and constructed new facilities at a cost of over $3 billion during the 1980s and 1990s. The ready availability of funding from the high-yield junk bond market in the 1980s served as a stimulus for some of the expansion. Various other funding instruments to support expansion were also used, such as offering notes, using credit lines, borrowing from banks, making stock offerings, and drawing on free cash flows to finance capital expenditures.

The number of available guest rooms in Las Vegas during the 1980s increased at an annual rate of 4.1% through an expansion of existing properties (First Boston, 1991). The opening of two major casino/hotel facilities within seven months of each other in 1989 and 1990 added 7,000 new rooms, increasing the number of available guest rooms to 72,000 by the end of 1990 – a 17% gain over 1988. Guest room expansion has continued, for example, with the Sahara's new 27-story guest tower, the Hacienda's new guest tower, the Stardust's 1,500 rooms, and the San Remo's 400 rooms. Several casino/hotel companies recently have invested over $200 million in refurbishing older guest rooms, such as at Caesars, the Desert Inn, the Showboat, the Sahara, and the Hacienda, to maintain their marketability and ability to effectively compete with new and refurbished facilities along the Strip. Las Vegas casinos/hotels maintained an average room occupancy of around 90% in 1989, but overcapacity heightened the competition and caused an overall 1% decline in casino/hotel occupancy in 1990. However, the new facilities averaged near 100% occupancy, and the less competitive, older facilities as a group experienced a decrease of 2% to 3% (First Boston, 1991). Because it will take time for the customer market to absorb the additional space, there will be near-term pressure on casino/hotel occupancy rates and profits.

Casino square footage in Las Vegas doubled during the 1980s with expansions at existing properties. By 1990, there were over 2 million square feet at the largest 15 casinos, with the two new casino/hotel facilities adding around 200,000 square feet to that capacity. Casinos recently have invested several hundred million dollars in expansions and remodeling to make more room for the new generation of slot machines, to add bingo and keno parlors, to redecorate interiors, and to stay competitive. In 1990, the estimated revenue per square foot of casino floor in 1990 at the 10 largest properties in Las Vegas ranged from $1,000 to $5,000 (First Boston, 1991).

Casinos also made numerous other capital improvements to enhance their facilities in the Las Vegas area. The Showboat built a six-story parking garage, Caesars constructed a new elaborate walkway entrance facing the Mirage, and the Mirage constructed a $15 million volcano/waterfall and developed plans for an estimated $133 million in additional improvements. Caesars World created a subsidiary to develop a country club resort with a hotel and golf villas just south of Las Vegas to compliment Caesars Palace on the Strip. Other casinos improved their drive-in entrances and parking areas to increase accessibility.

The casino/hotel industry in Las Vegas operates nine of the world's ten largest hotels and plans to continue both the expansion of existing properties and the construction of additional new facilities in the early- to mid-1990s through the investment of several billion dollars of capital funds (Iachetta, 1992). Funds have been spent for land acquisition and planning for several facilities; ground breaking and actual construction are in progress at others. The Sahara Resorts has opened its new \$35 million casino/hotel featuring an ice arena and a state-of-the-art bowling center as major recreational attractions in an attempt to target a new participatory and team sports market. Large, new facilities in Las Vegas, some to open in 1992 and 1993, include the MGM Grand Hotel (5,000 rooms and 171,500 square feet of casino space) and Theme Park (\$875 million); Caesars Palace's Forum Shops (240,000 square-foot, 90-shop recreated Roman village shopping complex); the Hard Rock Hotel (a \$65 million rock'n'roll-theme casino/hotel); a pyramid-shaped Circus Circus hotel, called the "Luxor" (2,500 rooms), and entertainment complex (\$290 million); a Golden Nugget Treasure Island resort (3,000 rooms) and "Pirates of the Caribbean" theme park (\$700 million); a large state-of-the-art water park; and a new Mirage resort.

GAMING STOCK OWNERSHIP

Stock of casino/hotel companies with facilities in Nevada is owned by institutions, individuals, and major investors. Institutional holdings are the percentage of outstanding common shares held by banks, insurance and investment companies, colleges/universities, and pension funds, all seeking to make money for their participants. Decisions to buy, sell, or hold are based on such factors as the financial strength of a company, current assets to current liabilities, working capital to revenues, price/earnings ratio, revenues, earnings potential, book value, and risk on investment.

Casino/hotel companies with a primary focus in Las Vegas have a large percentage of their stock held by institutions. According to the Investment Outlook Scoreboard published in Business Week (1991), institutional holdings of Caesars, Promus, Circus Circus, Aztar, Mirage, and Showboat were 70%, 69%, 64%, 58%, 41%, and 29%, respectively. Institutional holdings within other industry sectors were 48% for paper, 50% for appliances, 50% for general manufacture, and 42% for food processing, on average (Business Week, 1991). Private investors also can maintain major holdings, such as Mr. Kerkorian and his wholly-owned

Tracinda Corporation holding around 83% of MGM Grand, Inc., stock and W. Bennett owning 9.4% of Circus Circus Enterprises, Inc., stock (Standard and Poor's Corporation, 1991f, 1991g). Value Line (1991) reported that, during the first quarter of 1991, institutional decisions to buy stock of casino/hotel companies with properties in Las Vegas outnumbered decisions to sell for these aforementioned six companies. The College Retirement Equities Fund (CREF), formed to aid and strengthen nonprofit and research organizations in assuring their employees of retirement benefits, presently holds approximately $100 million of investments in Nevada gaming stocks (CREF, 1992).

Several companies successfully sold new stock offerings in the 1980s and into 1990. The Sahara Partners made a public offering in 1987 of 7 million depository units at $9 each, worth $58.4 million, to expand and renovate its hotels (Standard and Poor's Corporation, 1991d). The MGM Grand completed public offerings in December 1989 and January 1990 for 2.9 million common shares, with net proceeds of about $38 million (Standard and Poor's Corporation, 1991f). The Mirage Resorts issued 5 million common shares at $26 each in May 1991 to retire debt securities and restore working capital (Standard and Poor's Corporation, 1991c). Other companies repurchased common shares, as did Caesars World with 1.165 million shares in 1990 and Circus Circus with 10.9 million shares in 1987 (Standard and Poor's Corporation, 1991e, 1991g).

"Gaming stocks have been hot so far this year," according to the Inside Wall Street column in Business Week, September 7, 1992 (Marcial, 1992). ITT, a giant conglomerate, has announced that it is serious about getting into the profitable casino business. The rumors that Caesars World is a buy-out target of ITT has neither been confirmed or denied by ITT, although the management has filed for a gaming license in Las Vegas and in Atlantic City. Investors still predict profitability from investments in casinos.

CONSEQUENCES OF ECONOMIC GROWTH IN SOUTHERN NEVADA AND LAS VEGAS

The Las Vegas casino industry could be adversely affected by its own growth and that of southern Nevada. Continued development of large new casino space and hotel accommodations in Las Vegas and elsewhere in southern Nevada will have consequences – it will increase the intense competition for visitors to the point of significant adverse effects for existing facilities. A period of time will be necessary for the market to absorb the present Las Vegas and southern Nevada excess casino square footage and room capacity brought about by the opening of several major new casinos and the expansion of many others. New and expanded casinos/hotels in Las Vegas will require the migration of large numbers of new employees to the area who, in turn, will substantially impact the area's infrastructure and social service capabilities. Increased traffic congestion along the Strip and in downtown Las Vegas will negatively affect the movement of tourists and impact their "fun." Increased demands for water by new and expanded casino/hotel facilities and new residents will outstrip available Las Vegas water supplies by 1995, unless new sources are found and/or a major conservation effort takes place (Reinhold, 1991). Reported regional environmental concerns and possible increases in local crime also will have an effect on the Las Vegas area's image as a "fun city" and its attractiveness to visitors.

Rapid development and a doubling of the population during the past two decades "has caused longtime Nevadans and new residents alike to complain that people are bringing with them the problems of congestion, air pollution, and crime from which they fled" (Cannon, 1991). The state report, Yucca Mountain Socioeconomic Project – An Interim Report on the State of Nevada Socioeconomic Studies (NWPO, 1989), noted some serious social, infrastructure, and service effects as a consequence of the last two decades of rapid growth in the Las Vegas area and determined that state and local efforts to correct these problems were not very successful (NWPO, 1991). As a result, area politicians and the media are now supporting a call for restraints on growth (Cannon, 1991; Reinhold, 1991). Visitors and the visitor/gaming industry, though, directly contribute more than half of Nevada State General Fund revenues through taxes on gaming, sales (2% tax), liquor, cigarettes, and entertainment, thus subsidizing area infrastructure and services provided to state residents (Technical Review Committee, 1990; Reinhold, 1992). The development of a diversified non-gaming industry and the continuing steady stream of new residents and new industries into the Las Vegas area are eroding the state's and Clark County's gaming-revenue-based tax base. Yet, a broader-based economy with an increase in non-gaming employment sectors for southern Nevada, which would enable the economy to better withstand a variety of exogenous influences, is a goal of the Las Vegas region.

CONCLUSIONS

A continuing pattern of long-term economic growth is forecasted for the southern Nevada and Las Vegas area casino/hotel industry, as the trend of increases is expected to occur in the number of visitors, immigrants, business relocations, and total gaming revenues. Additional capital commitments to remodel and expand existing casino/hotel establishments and to develop new, large-scale theme facilities continue to be supported by the investment community, in spite of the nation's current recession. Private and corporate investors, including financial institutions that are involved with Nevada gaming stocks and casino/hotel capital investments, continue to invest while faced with uncertainty about the repository and possible repository-related events. These investors may believe in one of several future scenarios in which their investment and the state's economy will not to be adversely affected, including: the repository would not ultimately be located in Nevada; satisfactory payback would be received before the development of the repository or the occurrence of repository-related accidents; or alternatively, the contention that a repository would result in negative imagery leading to stigmatization does not appear to be valid.

Because state researchers have not concluded that imagery effects have definitely occurred and since gaming-stock ownership remains a strong institutional favorite, there seems to be a disconnect between the beliefs of investors and the beliefs of survey respondents. Through image surveys, state researchers have found a fear of things nuclear, and especially an underground nuclear waste storage facility. At the same time, investors who must weigh the potential for future returns on equity continue to make positive investment decisions involving Nevada and Las Vegas gaming stocks. The opinions of investors, as voiced by their continuing investment in the Nevada economy, reveal that they have evidently discounted predictions of possible adverse economic impacts from a repository and demonstrate a belief that southern Nevada will remain a premier vacation or convention destination for those seeking full-casino gaming, recreation, resort, entertainment, and "must see" attractions.

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(Editor's Note: In the real world, impact assessment often involves advocacy and disagreement. Therefore, the editors solicited a counterpoint article from representatives of the State of Nevada Agency for Nuclear Projects, Nuclear Waste Project Office. Although they were unable to produce an article for this issue, the offer remains open.)