Casino Gambling as an Economic Development Strategy

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Published in *Tourism Economics* (1997) 3,2: 161-183

Acknowledgements: This research was supported by grants from the National Science Foundation (NSF), the Allegany County, Maryland, Chamber of Commerce, and the Allegany County Blue Ribbon Task Force on Gaming. The authors would like to thank Bill Eadington of the University of Nevada at Reno and Jon Loff of Allegany College for guidance in identifying important literature in this understudied area. The views expressed in the article are those of the authors and not necessarily those of the sponsoring agencies or affiliated institutions.

ABSTRACT: Casino gaming has experienced dramatic growth in the United States during the past seven years. Because this growth has occurred recently, there have been few systematic studies of its effects. This paper uses quasi-experimental control group methods to study sixty-eight counties where casinos were opened during the period 1989-1993 and three multi-casino counties. Results show that casino gambling is adopted by economically struggling counties and that it can be a successful development strategy. The effects trickle down to other sectors of the economy, including recipients of income maintenance payments. On the downside, local governments and local workers do not appear to appear to reap the lion's share of benefits, as much of the income generated by casinos is dissipated through leakages outside the host county. Finally, some casino types and locations are marginally better than others, but these factors are not prominent determinants of casino effects at this time.

KEYWORDS: Casinos, economic development, statistical methods

1.0 INTRODUCTION

Casino gambling is experiencing rapid growth in the United States. During the last decade, annual industry growth rates averaged nine percent, and revenues passed the ten billion dollar mark [1]. The source of this growth is both intensive and extensive. The older casino gambling districts in Nevada and Atlantic City, New Jersey, have grown in leaps and bounds as they evolve into multifaceted recreational complexes. Native American tribes have found that by establishing casinos on reservations and tribally owned land, they can enhance their prospects for economic independence. During the past seven years, numerous states have legalized various forms of private casino gaming and additional states are poised to do so. This growth is expected to continue in the U.S. Analysts have noted that local markets are still far from saturation, the aging population has more disposable income, governments are in search of additional ways to raise revenue, and competitive pressures for gaming are spreading [1].

Casino gaming is but the latest growth wave in a series of gambling booms. Almost every state in the U.S. now allows some form of gambling activity, including lotteries, pari-mutuel racing, and bingo, and virtually every community now has some form of gaming activity. Casino gambling has also become highly differentiated. It may take the form of machine gaming, table gaming, state controlled gaming, riverboat gaming, Indian gaming, and charitable gaming [2]. These situations complicate the task of identifying casino impacts.

Measuring the effects of casino gaming is also difficult because its spread is a relatively recent phenomena. Any substantive ex-post analysis must rely on the experiences of Nevada and Atlantic City, where casinos have been in operation for two decades or more. The scale and uniqueness of these localities make it difficult, however, to extrapolate their experiences to other places. In addition, the casino industry is a fledgling industry which can expect considerable turbulence from competitive pressures in the next few years. Many casinos will be driven out of business, and casino communities may be forced to resort to more innovative ways to retain their gambling clientele [3; 4; 5]. The likelihood of new federal regulations may also alter considerably the character of this industry.

Public discussion of the effects of casino gaming centers on two basic issues: social and economic. Casinos are alleged to aggravate all kind of social problems, including crime, prostitution, compulsive gambling behavior, family strife, and alcoholism [6; 7; 8; 9], but there is no conclusive

evidence about these matters. Unfortunately, regional economists have little to offer in this area because their stock of analytical techniques are better suited for measuring economic benefits than measuring economic costs. Complicating the measurement of these effects is the fact that many social externalities are hidden, diffuse, and difficult to measure using a dollar metric.

This paper will focus primarily on the economic effects of casinos. Although we can expect casinos to have a stimulating effect, some questions have been raised about the nature and duration of these positive impacts. As short-lived casino riverboat enterprises in Iowa and Mississippi attest, not every area is situated to benefit from casino gambling [10; 11]. Some communities may lack the prerequisites for developing a viable casino industry. Even those communities that do succeed in attracting substantial development may fail to realize all of the benefits because local labour markets are unable to supply the new industry with the trained professionals it needs. Lastly, questions have been raised about the effects of this recreational sector on other local enterprises. If the casino industry has few backward linkages, and instead "cannibalizes" local enterprises, it may create additional problems that require redress [8].

This paper uses quasi-experimental control group methods to measure the effects of casinos on economic growth and development. It is divided into several parts. The first section consists of a literature review concerning the effects of casinos on regional growth and development. The second section describes the quasi-experimental method. This section is somewhat abbreviated because discussion and documentation of the method can be found in detail elsewhere [12; 13; 14]. The third section describes the characteristics of the data used in this study. The fourth section contains an analysis and explanation of the results. The final section provides a summary, conclusion, and policy recommendations.

2.0 LITERATURE REVIEW

To understand the likely economic effects of new casinos, it may be useful to first consider the characteristics of the average consumer in the average locale. Minnesota provides a good reference point. Minnesota is the largest gaming center between Las Vegas, Nevada, and Atlantic City, New Jersey, and has thirteen tribal casinos. It ranks nineteenth nationwide in terms of disposable income.

According to its experience, casino gambling is most popular among older and more affluent people. Minnesota's gamblers are drawn mostly from within the state, and much of the effect of the Indian casinos has been to redistribute wealth from the wealthier urban to poorer rural areas within the state [1]. However, casino gaming has also brought new expenditures from outside the state. The majority of casino jobs are full-time with health benefits and have wages ranging from five dollars to eight dollars per hour plus tips [1]. According to analysts in the state, the short term impact of tribal gaming has been to stimulate local economies, create jobs, increase local property values, put upward pressure on rural wages, and reduce public assistance costs. In the long term, they predict that the Indian casinos will provide a source of development capital for rural areas, assist in upgrading the tourist industry, and stimulate job training and managerial experience.

Based on this Minnesota description, casino gaming would appear to be an attractive economic development strategy. Contrary to some representations, casinos draw patrons primarily from the ranks of the middle class and upper-middle class. They are not likely to attract an especially troublesome or disruptive clientele. For rural areas, they provide decent entry-level and non-seasonal service jobs. The customers are drawn largely from outside the casino communities (whether regionally or extra-regionally). Moreover, the economic effects are expansionary and should help to generate additional tax revenue for community infrastructure and other social needs. In many of these respects, casino gaming appears to be superior to other tourism sectors which are sometimes faulted for providing low-paying, part-time, seasonal jobs or causing environmental spoilage. Corroborative evidence for many of these points can be found in other industry surveys [15; 16] as well.

Yet, perhaps this picture is misleading or too simplistic. Indeed, many questions have been raised about the likely benefits of casinos. Although economically struggling communities are often attracted to the casino development strategy [8, 9], not everyone can expect to benefit. It has been argued that, holding all else constant, the more urbanized a community is, the less likely it is to benefit from casino development [4]. In large urban areas, especially those that do not ordinarily attract many tourists, customers far more likely will be drawn locally. A useful rule of thumb is that when less than half of the gamblers are derived from outside the area, the industry is likely to have a redistributive effect within the community rather than an expansionary effect connected to exporting tourist services [17].

This situation is far less likely to prevail in a more rural setting because large rural casinos cannot prosper by marketing primarily to local residents.

Some rural communities are better situated to provide casino services than others. The locational determinants are documented in the tourism planning literature [18; 19]. For instance, communities in close proximity to larger urban areas are more accessible to potential tourists. Places with good transportation infrastructure are more attractive for the same reason. Because of recreational service complementarities (cultural heritage, theme parks, etc.), communities that have existing recreational endowments can market these attractions in combination with casino gaming to increase their market. Finally, areas that provide other service sector inputs competitively, such as skilled labor, low-paid labour, good public services, and amenities are more promising candidates for casino investment.

The type and location of casino development may also affect the nature, strength, and duration of development impacts. First, there appear to be strong localization economies in the casino industry. In those areas where competition is permitted, casinos show a marked tendency to cluster. Second, some types of casino gambling are inherently less efficient or customer-friendly than others, and, therefore, less likely to draw patrons. In particular, riverboat casinos are limited by space and operating conditions. They are regarded as hazardous or unnecessarily restrictive to many gaming customers and may not offer the economies of scale available to larger land-based casinos [11; 20]. Third, some state laws which restrict casino operations can have a detrimental effect on the competitiveness of state casinos. For instance, some states restrict wagers to small amounts, and others require the gambling facilities to float on rivers. These restrictions are intended to reduce some of the social externalities (such as crime and compulsive gambling) which are thought to be associated with casino gambling [3; 4; 5]. However, such restrictions can make the sites less attractive for all types of potential gamblers, and may further loosen linkages with the local economies [5; 20]. The patchwork system of U.S. state laws can also have the effect of creating lucrative gaming sites near the borders of states that restrict or ban casino gaming operations. Unlikely sites for recreational development along the border of a casino permitting state can blossom into lucrative gaming locations if surrounding states restrict casino gaming.

Communities should be forewarned that substantial economic growth may not always translate

into tangible economic benefits to the residents or locally owned businesses. The Atlantic City casino development experience has been described as being very uneven [21]. It has not resulted in substantial revival of other flagging economic sectors in the county. In fact, the development that has occurred can best be described as an "island" or an "economy within an economy" because of the preponderance of job creation in the casino service sectors with minimal spillover effect. Moreover, many of the newly created jobs go to out-of-county residents rather than local people, perhaps because local skilled labour is unavailable or casino firms discriminate against minority or underprivileged residents. Other negative distributive effects of large-scale casinos occur when native enterprises are "cannibalized" [8]. Casino competition may drive local establishments our of business. Because casinos are often full-service complexes that offer food service, retail marketing, lodging, and other services, local enterprises are vulnerable to competition in these areas. Even though rural casinos may cater to outside tourists, their effect on local service establishments still may be detrimental because they draw some local customers away from existing retail trade and service providers in the same way as a new regional shopping malls or hyper-markets do. In some circumstances, casinos may also displace existing businesses and residences by driving up local real estate prices and rents [8; 22].

3.0 RESEARCH METHOD

The quasi-experimental control group method used here is documented in several published studies [12; 13; 14]. The method chooses a control group of counties similar to counties which have received a particular treatment. In the case of casino development, the treatment is the construction or opening of a casino facility. The control group of untreated counties (or counties without casinos) serve as a benchmark against which to measure the effect of the treatment.

Since the ultimate goal is to compare the growth rates of casino and non-casino counties, every effort should be made to control for plausible non-casino causes of economic growth. For this study, the determinant variables were drawn from mainstream theories of regional economic growth, including reduced form equations of regional economic growth [23; 24]. These theories emphasize the role of spatial context, prior economic dynamism, the cost of labour and capital, and industrial structure in regional economic growth. Variables which measure these concepts are listed in table 3.1 along with

data sources [25; 26; 27]. They are used as selection variables in choosing county control groups.

Control counties must meet four conditions for this study. They have no casinos. They are sixty miles distant from a casino county (in order to protect against spatial interdependence). They do not have key data gaps caused by data disclosure restrictions, and they are similar to casino counties in industrial structure, spatial position, economic growth, and demographics in a period before casinos began to operate in the study counties. The Mahalanobis metric combines the variables listed in table 3.1 in a way to produce a single number that may be used objectively for ranking similarity. For the purposes of making group comparisons, an optimal matching algorithm determines the best matches for the casino counties taken as a group [28]. For the three individual multi-casino county case studies, three control groups of forty counties each were selected.

After a control group has been selected, it is evaluated by performing a statistical pre-test. The pre-test compares the growth of the casino treated county(ies) to the control group during a period before the casinos were opened. If the control group follows a similar growth path to the casino counties prior to the introduction of casinos, the control group is an appropriate benchmark for assessing the effect of the casino. That assessment is often referred to as a "post-test."

4.0 DATA

4.1 CHOOSING STUDY COUNTIES

The casino counties in this study were identified by using a casino tourism vacation guide for the United States [29]. It describes casinos that were open as of 1993. It makes no claim as to completeness and, in fact, excludes several levels of gaming operations, including bingo and pari-mutuel betting. In addition, it cannot be used to determine the size of each casino because data regarding the square footage of casinos was available for only about one-third of the entries. These data limitations are not particularly troubling because the effect of ignoring this information should be to create more conservative impact estimates. The effect of excluding pari-mutuels from the list of treatment counties, for example, should serve to create a downward bias in economic impact estimates because one would ordinarily expect their county-wide effects to be expansionary. Moreover, lumping smaller operations in with larger casinos should create smaller average economic impact estimates.

In order to study the economic effects of casinos, several categories are examined. First, a group

of casino counties, outside of long-established casino areas such Nevada and Atlantic City, New Jersey, are compared to a control group of non-casino twins. These sixty-eight counties are listed in table 4.1. Second, the matched casino counties are divided into casino categories, including: (1) Indian gaming (INDIAN) counties (i.e., counties where Indian casino gaming exists), (2) single casino (SINGLE) counties (i.e., counties that contain only one casino facility), and (3) riverboat casino (RIVER) counties (i.e., counties where riverboat casinos originate). Each county may be categorized into one or more of these groups (see table 4.1 column 2). Third, three individual multi-casino counties which permitted casino gambling during the last two decades and which have received much national attention are examined [22; 30; 31]. These are Atlantic County, New Jersey, (home of Atlantic City), Gilpen County, Colorado, (home of Central City and Black Hawk), and Tunica County, Mississippi.

4.2 MEASURING ECONOMIC AND SOCIAL IMPACT

Development impacts were measured using economic data from the Regional Economic Information System (REIS) [27] and crime data from the Uniform Crime Reports [32]. REIS contains personal income and employment data. The data used here is measured at the sectoral level and includes earnings and employment in industries thought to be important in assessing casino effects. These include sectors such as services, retail trade, and the state and local government sector. In addition, the REIS contains information concerning population, per capita income, residential adjustment (a measure of net earnings leakages paid to non-residents), transfer payments (which is itself divided into several categories including government retiree payments and income maintenance payments), and dividends, interest, and rent. The sectoral abbreviations used in illustrations are as follows: total employment (EMP), total earnings by place of work (EAR), per capita personal income (PCI), population (POP), income maintenance payments (TRF), dividends, interest, and rent income (DIR), residential adjustment income (RES), construction employment (CON), retail trade employment (RTL) and earnings (RTLY), finance, insurance, and real estate employment (FIR), service employment (SVC) and earnings (SVCY), state and local government employment (STL) and earnings (STLY). The Federal Bureau of Investigation (FBI) data contains reported offenses in the following categories: murder, rape, robbery, assault, burglary, larceny, auto theft, and arson.

The basis for impact measurement and tests of statistically significant effects for the group comparisons are growth rates differentials by income, employment, or crime category. Notationally, the growth rate differences are written as follows:

(4.2.1) $$D_{jt}=r_{cjt}-r_{gjt}$$

where D is the growth rate difference; c is a casino county c (c=1,...,68); g is control county g (g=1,...,68); r is the growth rate measured from base year b; j is one of the response variables (j=1,...,k); and t is the test year. For the individual county case studies, growth rate differences are converted to actual impact estimates in order to provide a more intuitive basis for comparison. Impacts are obtained by multiplying the growth rate differential (i.e., the difference between casino county growth and median control county growth) by the base level value of the corresponding income, employment, or crime category for the casino county. Notationally, this is written:

(4.2.2) $$I_{jt}=(r_{cjt}-r_{gjt})V_{cjb}$$

where I is the estimated impact, c is the individual casino county, g is the median control group county; r is the growth rate measured from base year b; j is one of the income, employment, or crime categories (j=1,...,k); V is the category value; t is the test year; and b is the base year. The t-test is the underlying statistical test for all grouped comparison tests. It is simply a test of whether the mean growth rate difference of the matched pairs is different from zero. A non-parametric rank test comparing casino county growth to the growth rates of its forty county control group is used for the individual county case studies [33].

For group comparisons, the casino control group is selected during the period 1969-72. All of the selection variables are 1969 values except for total income growth and population growth which are calculated over the period 1969-72. 1972 serves as the base year and 1987 is the final test year for the pre-test, during which casino counties and their matches are tested to determine whether they follow similar income and employment growth trajectories before the advent of the casinos. When this is

confirmed, 1987 is selected as the new base year for the purpose of isolating better the actual net effects of the casinos. Because of data limitations, 1980 served as the initial base year for crime comparisons, which was then changed to 1987 for purposes of isolating the crime effect of the casinos. For the individual case studies (Atlantic, Gilpen, and Tunica), control groups were selected several years in advance of the casino establishment: For Atlantic, 1972-75; for Gilpin 1985-88; for Tunica, 1986-89. These periods left two years prior to the actual impacts to evaluate the fit of each control group.

The results are presented using a table and a series of graphs displaying the differences between casino counties and their respective control groups. Sectoral growth rate differences that are statistically significant different from zero at the $\alpha = 10\%$ level are indicated by asterisks on the tables and annotation in the lower left-hand corner of each graph. For example, in table 5.1, casino counties grew 99 percentage points faster on average in service employment (the sector which includes casino employment) than their matches during the period 1987-94. This is not only absolutely impressive. It is statistically significant. On the other hand, the 43 percentage point difference in manufacturing employment growth during the pre-test (PRE) period 1972-87 is not statistically significant.

For all counties and county groups examined here, the pre-test revealed few problematic statistically significant positive discrepancies. That is to say, the casino counties were either growing at the same rate or slower than their respective casino counties during a period before the advent of casinos. Therefore, subsequent positive growth rate differentials may be reasonably attributed to the effect of the casinos. When the pre-test indicates slower growth, the casino effect is underestimated.

5.0 RESULTS AND ANALYSIS

The introduction and literature review raised numerous questions about the economic effects of casino gambling that this section will attempt to answer. The following assertions will serve as hypotheses: (1) counties are attracted to casino development because they are experiencing economic problems and see it as a solution to their economic difficulties, (2) casino development is a good way to stimulate economic growth, (3) casino development is a good way to stimulate economic development, (4) new casino operations contribute to the growth of the state and local government sector of the host county, (5) casinos result in fewer residents drawing on public assistance, (6) casinos increase the

incidence of crime, (7) casino development does not benefit other industries, (8) some types of casinos are more likely to stimulate economic growth, (9) casinos draw many of their employees from outside the host county, (10) competitive pressures are beginning to reduce the stimulative effects of established casino districts, and (11) regional characteristics help determine the overall economic effect of a casino. Replies to each of these questions are arranged below:

Lagging counties seeking a solution? The types of counties that received casinos during the period of this analysis can be characterized as economically depressed. Generally, casino counties had poor economic fortunes during the 1970s and early 1980s. Figure 5.1 shows that during the period 1973 to 1987, before the arrival of casinos, the casino counties on average suffered from lagging earnings, employment, and population growth. State and local government earnings and employment lagged behind matched counties during this period also. This situation was largely reversed by the early 1990s. This result suggests that counties may be recruiting casinos to offset persistent decline in their economies.

A good way to grow the economy? The new baseline of 1987 was selected in order to isolate the effect of casino counties, which began service during the years 1989-93. Figures 5.2 and 5.3 show results for key sectors plus income maintenance payments (TRF); dividends, interest, and rent (DIR) income, population (POP), construction employment (CON); and finance, insurance, and real estate employment (FIR). Overall earnings grew forty-six percentage points faster in casino counties during this time period than in the matched counties. This result is statistically significant. Driving this overall effect was the service sector which grew nearly 100 percentage points faster. This huge effect stems largely from casino development. Positive effects can be found elsewhere, including construction, retail trade, and dividends, interest, and rent. One can infer from this evidence that casinos are, indeed, a good way to grow an economy.

What happens to "economic development"? Economic development is a multifaceted concept that reflects numerous concerns not captured by conventional income statistics [34]. Per-capita income,

imperfect as it is, still provides one plausible measure of economic well-being. Per capita income grew nearly five percentage points faster in casino counties than in their non-casino county counterparts (see table 5.1). This result is statistically significant. Therefore, casinos not only grow the local economy, but on average residents gain as well.

Do casinos stimulate local government spending? During the pre-test phase, casino counties grew slower than their matches in most sectors. This was pronounced in the state and local government sector (see table 5.1). Post-test inferences must be tempered by this finding. No valid inferences could be made for the post-test if the growth continues to be negative, whereas positive post-test period growth provides a more conservative measurement of impacts [35].

State and local government spending does not expand as hypothesized during the period 1988-94. The casino counties' growth rates no longer lag behind their control group, but there is no rapid growth in this sector. This result may be a consequence of the relatively poor control group fit for this sector. Alternatively, it may imply that state and local government sector is not stimulated by new casinos. Yet, this latter conclusion is difficult to reconcile with the fact that communities often recruit casino development with the hopes of generating new public revenue. Moreover, one might expect that the casino industry would generate a need for additional local expenditures to build public infrastructure and ameliorate purported negative social effects. If additional public revenue were generated and spent, it should be reflected in the earnings of workers in the county state and local government sector and should be detectable there.

That it is not invites some speculation. One possible explanation is that casino revenue merely displaces revenue lost from competing gaming types such as lotteries and pari-mutuels or, that casino tax revenue is used to decrease tax burdens elsewhere. In this instance, no net revenue effects would accrue. If net revenue is affected, there is no guarantee that the expenditures will occur locally. Tax revenues may accrue to the state, and expenditures may be diffused throughout the state in a way that makes it difficult to detect changes at the host county level. Alternately, casinos may not generate a need for additional public expenditures under certain circumstances. The declining communities which recruit casinos may already have considerable excess capacity and may already have the resources to deal with

any resulting negative social effects of casino development. Or, the casinos themselves may provide the necessary security and other services to deal with problems resulting from the casinos. Finally, as the next sections seem to indicate, the casinos may actually generate few or no negative social effects, thereby making corrective action unnecessary.

Is there less need for public assistance? Based on the results here, one could infer that casinos lessen reliance on public assistance. This occurs in the aggregate (see table 5.1), particularly for income maintenance payments, as well as in the multi-casino cases of Atlantic County, Gilpin County, and Tunica County, (these results are not shown graphically because of the relatively small magnitude of the statistically significant impacts). Although income maintenance benefit payments make up only a small portion of personal income, they are indicators of vexing social maladies such as poverty and structural unemployment. Lessening reliance on such payments can be regarded as an achievement. The results suggest that casino earnings and employment opportunities do "trickle down" to the lower income residents to some extent.

Do casinos cause crime? The answer suggested by table 5.1 is "no." The average casino host county was no more likely to experience a crime wave than its non-casino match in 1993. The casino group had more than the expected number of rape and arson offenses *before* the casinos were built and not thereafter. Indeed, there were no statistically significant positive differences over the whole period during which casinos functioned (except automobile theft for one year). However, as figures 5.7 and 5.8 show, this general tendency does not hold true for every casino county. The multi-casino cases of Atlantic and Gilpin actually saw statistically significant crime impacts after the introduction of casinos (Tunica is not shown because of data unavailability). Most of this increase stems from a large rise in larcenies. In each county, total reported offenses in 1993 were over 50% more than would be expected based on the performance of the control groups.

These latter results, though indicative of social costs that must be accounted for when planning casinos, do not provide conclusive evidence that casinos are inherently pernicious. Crime increases may stem from increased tourist volumes rather than the casinos themselves, and any major recreational

attraction may have similar consequences [36]. This conclusion is not warranted, according to the results of an exploratory regression analysis reported in table 5.2. The dependent variable is the growth rate difference between casino and non-casino county matches for all reported offenses during the period 1988-93. The independent variables are various spatial and economic characteristics of these study counties, including: (1) RIVER (whether a county hosts a riverboat casino or not, 1=Yes and 0=No), (2) MULTI (whether a county hosts more than two casinos, 1=Yes and 0=No), (3) PCI87, per capita personal income in 1987, (4) PREC87, the percent of total personal income from amusements and recreation services earnings in 1987 (a measure of the effect of the size of the casino county tourism sector on county crime differences), (5) PDEN87, population density in 1987, (6) PTPP87, population potential in 1987 for counties within 60 miles, and (7) CITY250, distance to a city with 250,000 residents in 1980. The results indicate that the size of a county's tourism sector is not associated with higher crime effects, but the size and character (MULTI and RIVER) of the casino development are. Curiously, the positive coefficient for RIVER suggests that basing casinos on riverboats does not mitigate the effects of casinos on crime, often a reason for preferring riverboat casino development to land-based development. However, this variable may be, in part, reflect northern-southern differences in crime growth caused by Mississippi State counties in this group.

Do other industries benefit? Figure 5.3 shows that other sectors of the economy may benefit. Although the service employment effect is the most dramatic (statistically significant during 1990-94), the differences between the casino and non-casino counties are significant for some other industries as well. For example, statistically significant positive differences are noticeable in retail trade (1990-91), finance, insurance, and real estate (1989-94), and construction (1991-93) employment. Federal civilian and federal military employment also show significant effects during this period, but the magnitudes are relatively small and unlikely to be related to casino development. Furthermore, earnings effects in these sectors were often of greater magnitude and duration (see table 5.1), and there were no statistically significant declines in income or employment. Therefore, there is no evidence that casino development "cannibalizes" other sectors of the economy.

Who gets the jobs? Figure 5.2 shows that residential adjustment growth is negative and statistically significant in 1994. This indicates that a net outflow of income is stimulated by the casinos. This reflects casino jobs being awarded to people who reside outside of the county. Extreme examples of earnings drains are shown in figures 5.4-5.6 for multi-casino counties. In each instance, a substantial portion of the total impact is offset by the a net outflow of earnings. These results suggest that casinos look outside the host county for their labour needs. The fact that much of the casino generated income goes to "outsiders" is noteworthy.

What about increased competition? Atlantic County, New Jersey (see figure 5.4) provides a sobering look at the consequences of increased competition in the casino industry. The expansion in Atlantic City appears to have stalled in the early 1990s. This event occurs during a time when many other states enacted legislation to permit a greater variety of gaming activities. This result should be of concern to established gambling venues which are adding capacity.

Are some casinos better than others? Riverboat casinos reputedly are less likely to stimulate employment than land-based casinos because of their relative isolation from host counties [20]. This hypothesis is not supported by the results of figure 5.9. Three categories of casino counties are examined here: (1) counties which contain at least one riverboat casino (RIVER), (2) counties which contain at least one Indian casino (INDIAN), and (3) counties that contain, at most, one casino of any type (SINGLE). As the figure shows, riverboat counties as a group have bigger total employment effects than others. They grew twenty-five percent faster than their control matches, while Indian casino counties grew 14 percentage points faster, and single casino counties grew about 12 percentage points faster. Other factors, such as scale of casino development and county locational characteristics, may be impinging on this relationship. Therefore, the next section describes the results of a multivariate regression analysis used to investigate this issue further.

Are some locations better than others? Based on the literature review, one should expect the expansionary employment effects of any given casino to vary based on county and casino characteristics

such as (1) proximity to larger urban areas, (2) quality of transportation infrastructure, (3) restrictiveness of state casino gaming regulations, (4) proximity to non casino-gaming state(s), (5) presence of other recreational attractions, climate, and amenities, (6) scale of casino development (as measured, say, by square footage of gambling area or number of casinos), and (7) quality, cost, and amount of other recreational industry inputs such as labour and public services. The expected relationships are as follows: (1) closer proximity to larger urban markets and better connectivity infrastructure (roads, rail, and airports) result in greater impacts, (2) looser casino gaming regulations and close proximity to restrictive states are associated with larger impacts, (3) a large and diverse recreational sector and good climate/amenities contribute to larger impacts, (4) more and bigger casinos create larger effects, and (5) higher quality labour resources and lower wages contribute to higher employment effects.

In order to explore these relationships, a regression analysis was performed using the total employment growth rate difference for the period 1988-94 obtained from the control group analysis as the dependent variable. The independent variables used here reflect only partially the factors described in the literature because of data limitations. These variables are mainly locational and industrial characteristics of the counties and were introduced earlier in the context of explaining crime rate growth. PTPP87, PDN87, and CITY250 reflect market potential and accessibility. PCI87 is a regional wage indicator. PREC87 measures the size of the recreational sector. Since it reflects the size of this sector before casino development, it may partially measure diversity as well as size. RIVER is a proxy variable used to measure casino accessibility, and MULTI measures the size of the casino district.

Table 5.2, column (2), presents the result of the regression analysis. Two variables are statistically significant using a two-tailed test with α=.10. Contrary to the results of the previous section, counties with riverboat casinos (RIVER) do not stimulate employment any more than other casino types, once confounding factors are accounted for. Consistent with the hypothesis that more casinos translate into bigger impacts, the coefficient for MULTI is both positive and statistically significant. However, the coefficient for CITY250 is also positive, indicating that greater isolation from large urban markets is associated with a larger impact. This result conflicts with expectations from tourism market analysis but casino gambling is no ordinary tourism industry. Indeed, more urban markets will often experience a preponderance of local substitutional rather than export effects [4]. Therefore, urban proximity may have

a depressing effect on the stimulative effect of new casinos.

These findings are tempered, however, by the limited explanatory model. Consequently, one may question how much of a hindrance casino and locational characteristics are at this stage in U.S. casino industry development. As some observers have noted, the casino gambling market may be quite undersupplied because of legal and institutional barriers [37]. It may be so far from saturation that normal competitive processes have not yet come into play in determining locational successes.

6.0 CONCLUSIONS

Casino gaming is a popular strategy for local economic development in the United States, and it continues to grow in popularity as states further loosen their restrictions on gaming activities. This study focuses on the economic questions surrounding this issue. It confirms much of the popular wisdom concerning casino gaming. It is an attractive development strategy for economically lagging counties. Casinos generally stimulate economic growth (as measured by earnings and employment) and development (as measured by per capita income). Moreover, the effects appear to be broadly expansive and to reach recipients of public assistance. Crime, while stimulated in some multi-casino counties, is not noticeably affected elsewhere. On the downside, for one reason or another, earnings in the states and local government sector are not measurably stimulated. Moreover, much of the income generated by casinos is dissipated through leakages to those who reside outside the county. Finally, not all counties are poised to benefit equally from casino development. Multi-casino and more spatially isolated counties fare better than other counties in accruing employment benefits from casino development.

These results suggests some cautionary advice for communities pursuing a casino economic development strategy. Since casino development may require additional infrastructure and public services, communities must be vigilant in assuring that they capture the benefits of the development in increased local revenues. Moreover, there should be mechanisms to ensure that local labour is equipped with the skills necessary to fill the new jobs. Training subsidies for local workers or the creation of educational programs in hospitality management might be helpful. Finally, communities should realize that the casino industry represents somewhat of an economic development gamble. Some places are likely to be better situated for the inevitable next round of competition than others, even if it is not painfully

obvious yet. As gaming activity expands and a uniform body of federal statutory law develops, casino communities will find themselves dangerously exposed to outside competition. Therefore, if a community wants to avoid a boom and bust of casino development, it should assess its prospects realistically. As part of this assessment, it should appraise the desirability of a casino within the framework of an overall long-term tourism development strategy.

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Table 3.1 Control Group Selection Variables

Industrial Structure
Farm earnings share of total personal income
Manufacturing earnings share of total personal income
Federal government earnings share (civilian and military) of total personal income

Population, demand, and spatial aspects
Logarithm of population (base ten)
Logarithm of population potential for counties within 60 miles
Logarithm of population potential for 60-500 mile radius from the counties
Residential adjustment income share
Transfer income share of total personal income
Per capita dividends, interest, and rent income
Per capita total personal income
Distance to city of population 25,000 or greater
Distance to city of population 100,000 or greater

Growth
Total personal income growth rate
Population growth rate

Data sources: [25; 26; 27]

Table 4.1. Casino Study Counties

Gilpen, Colorado
La Plata, Colorado
Montezuma, Colorado
Teller, Colorado
New London, Connecticut
Jo Daviess, Illinois
Kane, Illinois
Madison, Illinois
Massac, Illinois
Rock Island, Illinois
St. Clair, Illinois
Tazewell, Illinois
Will, Illinois
Clinton, Iowa
Dubuque, Iowa
Monona, Iowa
Scott, Iowa
Tama, Iowa
Woodbury, Iowa
Baraga, Michigan
Chippewa, Michigan
Gogebic, Michigan
Isabella, Michigan
Leelanau, Michigan
Mackinac, Michigan
Menominee, Michigan
Beltrami, Minnesota
Carlton, Minnesota
Cass, Minnesota
Cook, Minnesota
Goodhue, Minnesota
Lake of the Woods, Minnesota
Mahnomen, Minnesota
Mille Lacs, Minnesota
Pennington, Minnesota
Pine, Minnesota
Renville, Minnesota
St. Louis, Minnesota
Scott, Minnesota
Yellow Medicine, Minnesota
Adams, Mississippi
Hancock, Mississippi
Harrison, Mississippi
Tunica, Mississippi
Oneida, NY
Benson, North Dakota
Mountrail, North Dakota
Rolette, North Dakota
Charles Mix, South Dakota
Codington, South Dakota
Lawrence, South Dakota
Lyman, South Dakota
Snohomish, Washington
Whatcom, Washington
Ashland, Wisconsin
Barron, Wisconsin
Bayfield, Wisconsin
Brown, Wisconsin
Burnett, Wisconsin
Forest, Wisconsin
Jackson, Wisconsin
Milwaukee, Wisconsin
Sauk, Wisconsin
Sawyer, Wisconsin
Vilas, Wisconsin
Wood, Wisconsin

Warren, Mississippi

Table 5.1 Effects of casinos on personal income, employment, transfer payments, and crime.

INCOME AND EARNINGS

	PRE	1988	1989	1990	1991	1992	1993	1994
Total personal income	-18.5	-0.9	1.0	2.8*	3.5*	5.0*	6.0*	9.4*
Population	-6.1*	0.7*	0.8*	1.2*	1.4*	1.9*	2.5*	3.0*
Per capita personal income	0.0	-1.5	0.1	1.4	1.7*	2.3*	2.4*	4.8*
Earnings by place of work	-26.3*	-0.2	2.5*	6.0*	9.0*	24.9*	32.4*	45.9*
Adjustment for residence	1.4	-1.2	-1.6	-0.9	-3.9	-8.3	-9.5*	-10.1*
Dividends, interest, and rent	-33.8	-1.2	-0.1	-0.2	2.4	3.4*	6.7*	7.1*
Transfer payments	-15.2	-1.3*	-1.6*	-3.2*	-5.3*	-7.6*	-8.1*	-9.5*
Wages and salaries	-34.2*	0.5	2.2*	5.5*	10.6*	32.4*	45.2*	60.0*
Farm earnings	14.8	4.8	-5.4	-20.7	-36.0	-40.2	-89.5*	-52.3
Private earnings	-33.1*	0.3	3.4*	6.0*	11.4*	34.4*	49.0*	67.2*
Agricultural services, forestry, fishing, and other	22.3	-6.7*	-8.3	0.3	-1.8	6.2	-2.3	2.5
Mining	-56.5	16.9	16.3	55.4	27.0	95*	83.4*	83.7
Construction	-59.9*	0.5	-2.2	1.6	18.6*	27.6*	29.0*	1.8
Manufacturing	125.2	3.0	7.4	2.9	1.1	12	1.7	-9.1
Transportation and public utilities	-35.4	8.2	28.1	35.3	43.4	57.5	62.5	65.8
Wholesale trade	-114.4	1.6	8.2*	7.1	10.7	5.1	10.3	8.8
Retail trade	-33.2*	0.5	2.8*	5.8*	8.5*	7.0*	6.9*	7.4*
Finance, insurance, and real estate	-33.9	2.5	1.9	8.8	11.8*	17.3*	22.9*	27.0*
Services	-3.1	0.3	4.5*	6.9*	20.0*	100.1*	152.6*	226.2*
Federal, civilian	-7.7	2.9*	3.1	4.7*	3.5	5.9*	5.1	8.9*
Military	0.1	-0.4	-0.8	2.3*	2.3*	2.7	5.0*	6.2*
State and local	-43.6	-0.3	0.1	0.4	0.2	0.7	0.9	0.5

EMPLOYMENT

	PRE	1988	1989	1990	1991	1992	1993	1994
Total full-& part-time employment	-6.9	0.6	1.6*	3.6*	6.6*	16.6*	21.6*	27.6*
Wage and salary employment	-6.1	0.6	1.5*	3.9*	7.5*	21.9*	28.8*	36.8*
Farm employment	0.5	0.6	-0.5	-0.1	0.4	-1.0	-0.9	-0.5
Private employment	-5.7	0.8	2.3*	4.4*	8.2*	21.8*	29.5*	38.9*
Agricultural services, forestry, fishing, and other	17.1	-6.5*	-5.1	-2.8	-15.3*	-15.2*	0.7	-1.2
Mining	-66.2	-2.2	-1.1	10.0*	-12.9	-8.8	-3.4	-13.3
Construction	-17.0	0.2	2.3	6.8	9.9*	14.8*	15*	8.9
Manufacturing	42.6	1.3	1.9	1.3	-1.8	2.3	0.1	-1.8
Transportation and public utilities	-0.6	-0.7	2.0	4.7	7.2*	7.2*	7.5	9.7*
Wholesale trade	-34.2	-2.8	-3.6	-3.2	-1.3	-1	4.3	3.5
Retail trade	-7.2	-0.2	1.1	3.0*	5.0*	3.3	2.7	1.3
Finance, insurance, and real estate	-10.7	1.7	4.3*	8.1*	9.4*	10.6*	11.7*	11.7*
Services	2.7	1.5	2.3	6.1*	13.9*	49.8*	70.3*	99.0*
Government and government enterprises	-10.1	-0.1	-0.2	0.9	0.9	1.4	1.6	1.2
Federal, civilian	1.1	2.5	1.5	4.4*	2.9	4.2*	3.9	6.8*
Military	-1.8	0.5	0.3	3.2*	2.9*	3.0*	4.2*	4.2*
State and local	-15.6*	-0.3	-0.6	0.2	-0.9	-0.8	-0.8	-1.6

Asterisk indicates statistical significance at $\alpha = .10$. PRE indicates growth rates based on pre-test period, 1972-87.

Table 5.1 Effects of casinos on personal income, employment, transfer payments, and crime (continued).

TRANSFER PAYMENTS

	PRE	1988	1989	1990	1991	1992	1993	1994
Total transfer payments	-15.2	-1.3*	-1.6*	-3.2*	-5.3*	-7.6*	-8.1*	-9.5*
Retirement & disability insurance benefit payments	-18.3	-0.3	-0.4	-0.1	-0.2	-1.0	-0.4	0.0
Medical payments	-62.5	-2.7*	-2.3	-7.7*	-15.6*	-18.9*	-20.7*	-27.8*
Income maintenance benefit payments	47.8	-3.7*	-9.5*	-16.5*	-24.2*	-38.2*	-43.9*	-49.8*
Unemployment insurance benefit payments	-77.0*	3.0	-5.1	-14.8*	-25.7*	-47.9*	-34.8*	-12.8
Veterans benefit payments	-18.2*	0.0	0.8	0.5	0.0	-1.5	-2.9	-2.5
Federal educational & training assistance	287.6	-3.3*	-7.7	-7.4	-9.2*	-11.8*	-11.4*	-11.4*

CRIME

	PRE	1988	1989	1990	1991	1992	1993
Total	34.1	-5.1	-0.1	1.5	0.4	5.9	2.4
Murder	2.6	20.9	42.8	19.8	23.1	36.6	4.9
Rape	113.0*	-52.8	-29.9	-28.6	-82.8	-0.7	0.2
Robbery	-8.5	-8.3	-18.5	-3.5	-15.4	-15.0	-46.4
Assault	13.0	-7.6	-12.9	8.6	-7.4	-50.6	-58.5
Burglary	22.6	-7.8	-8.4	-0.5	-8.7	-6.4	-2.6
Larceny	38.7	-3.5	1.4	0.9	3.7	11.3	5.5
AutoTheft	-27.4	-3.2	10.2	18.7*	12.0	18.2	11.2
Arson	45.6*	-43.8	-171.5	-249.4	-358.1	-302.2	-210.4

Asterisk indicates one tailed statistical significance at α =.10.

PRE indicates growth rates based on pre-test period 1972-87 for income and earnings, employment, and transfer payments.
PRE indicates growth rates based on pre-test period 1980-87 for crime.

Table 5.2 Regression Analysis of Percentage Growth Rate Differences

	(1) Crime	t-value	(2) Employment	t-value
Intercept	-157.8237*	-3.084	1.11127	0.015
RIVER	37.3872*	2.204	-7.3777	-0.310
MULTI	54.6696*	2.322	155.4357*	4.284
PCI87[a]	10.6000*	2.564	-1.1428	-0.193
PREC87	-2.1969	-0.054	36.158	0.599
PDN87	0.0165	0.822	-0.0062184	-0.189
PTPP87[b]	0.1377	-1.941	0.00585023	0.053
CITY250[c]	5.6900	0.984	20.69*	2.141
Number of observations	54		68	
R^2	.30		.37	
Mean difference	2.4		27.6	

Asterisk indicates statistically significant from zero at α=.10 level.

[a] measured in thousands of U.S. dollars.
[b] measured in thousands of residents.
[c] measured in hundreds of miles.

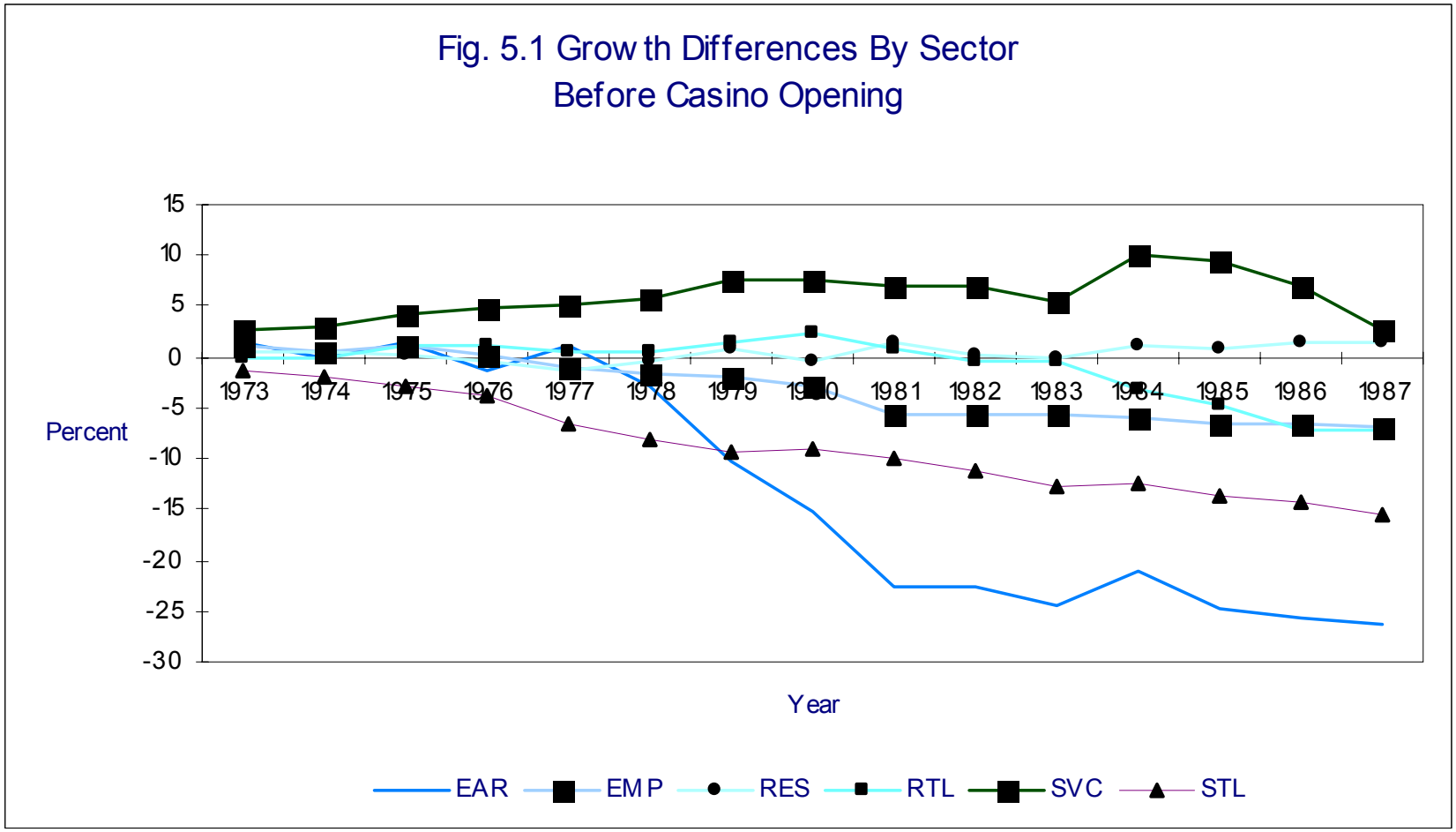
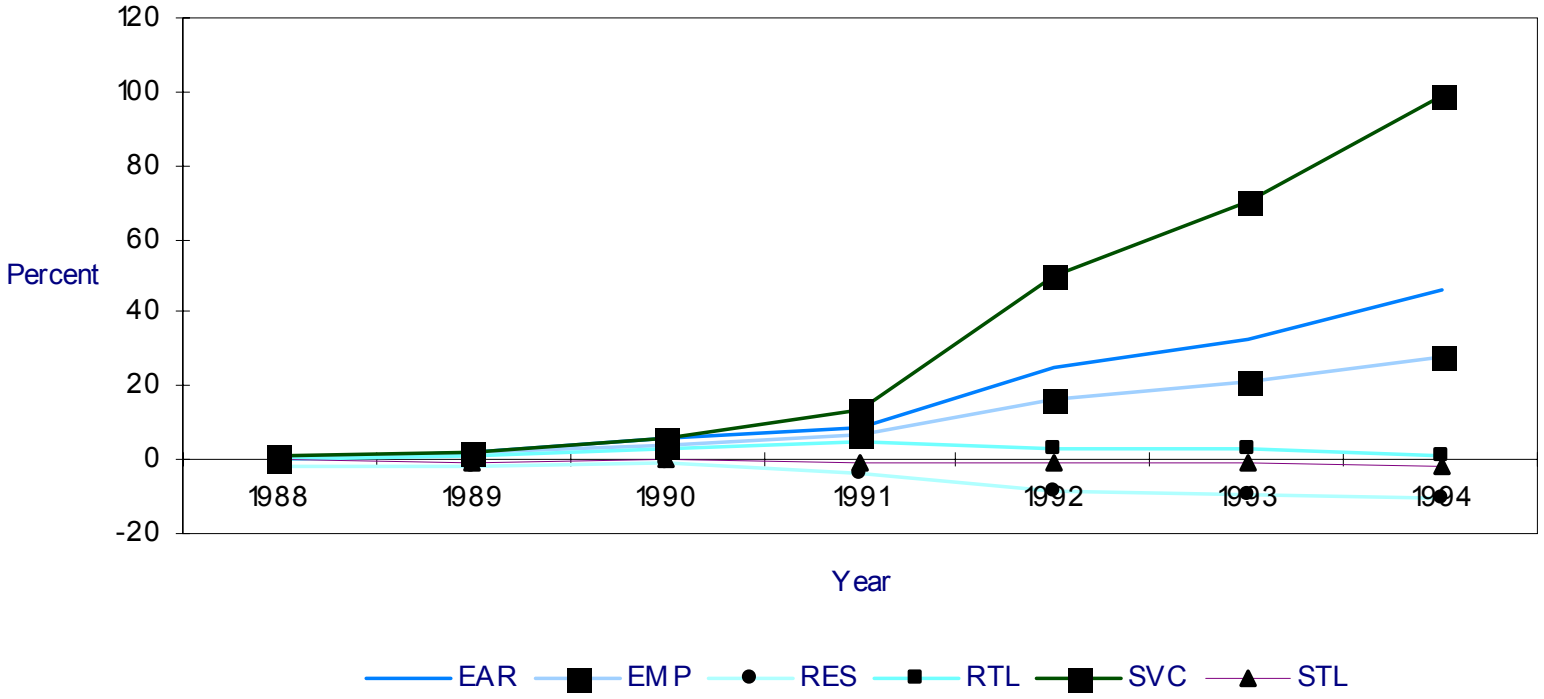


Fig. 5.1 Growth Differences By Sector
Before Casino Opening
15
10
5
0
-5
-10
-15
-20
-25
-30
Percent
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
Year
EAR
EMP
RES
RTL
SVC
STL

Fig. 5.2 Growth Differences By Sector
After Casino Opening



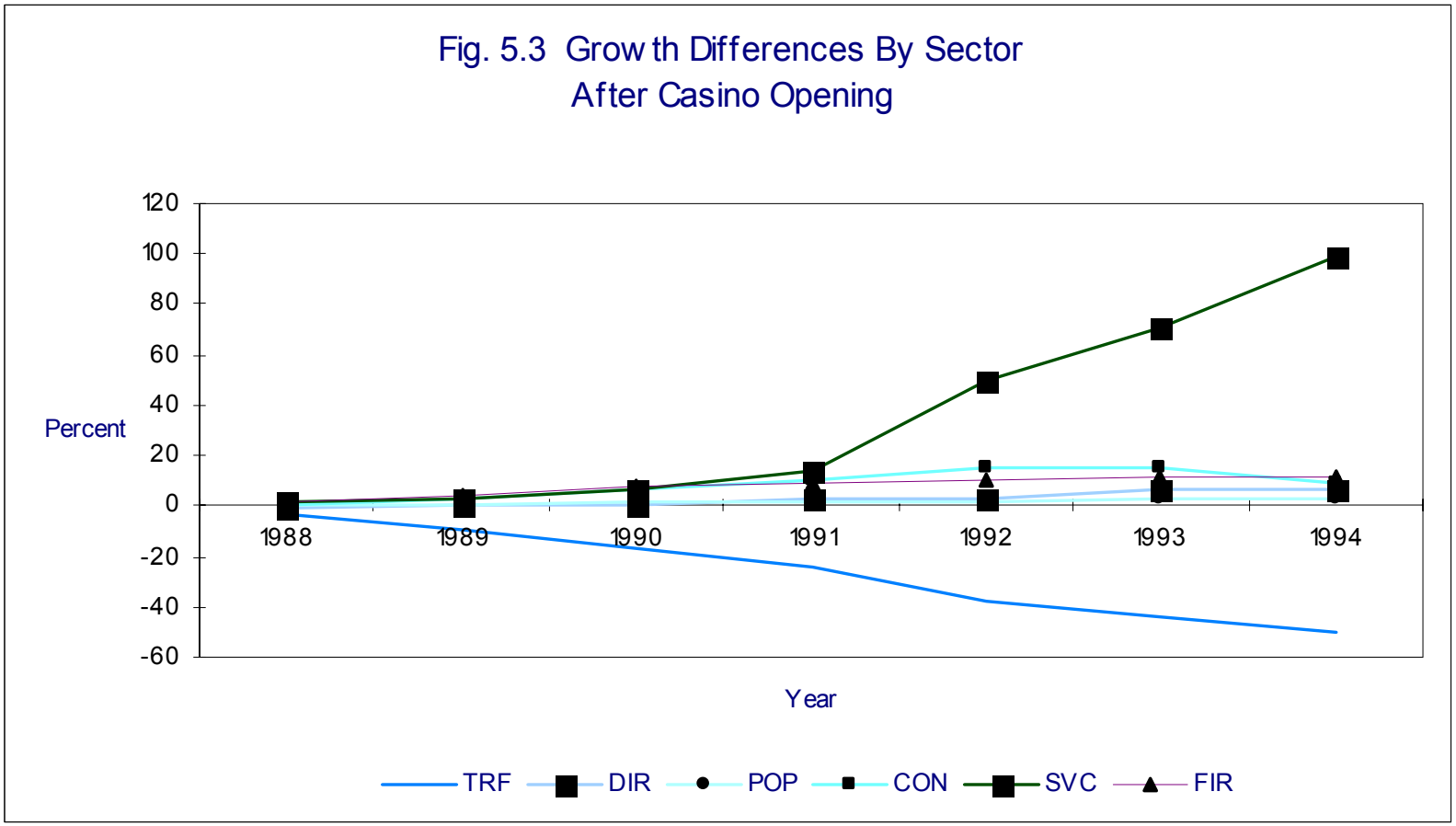


Fig. 5.3 Growth Differences By Sector
After Casino Opening
120
100
80
60
40
20
0
-20
-40
-60
Percent
1988
1989
1990
1991
1992
1993
1994
Year
TRF
DIR
POP
CON
SVC
FIR

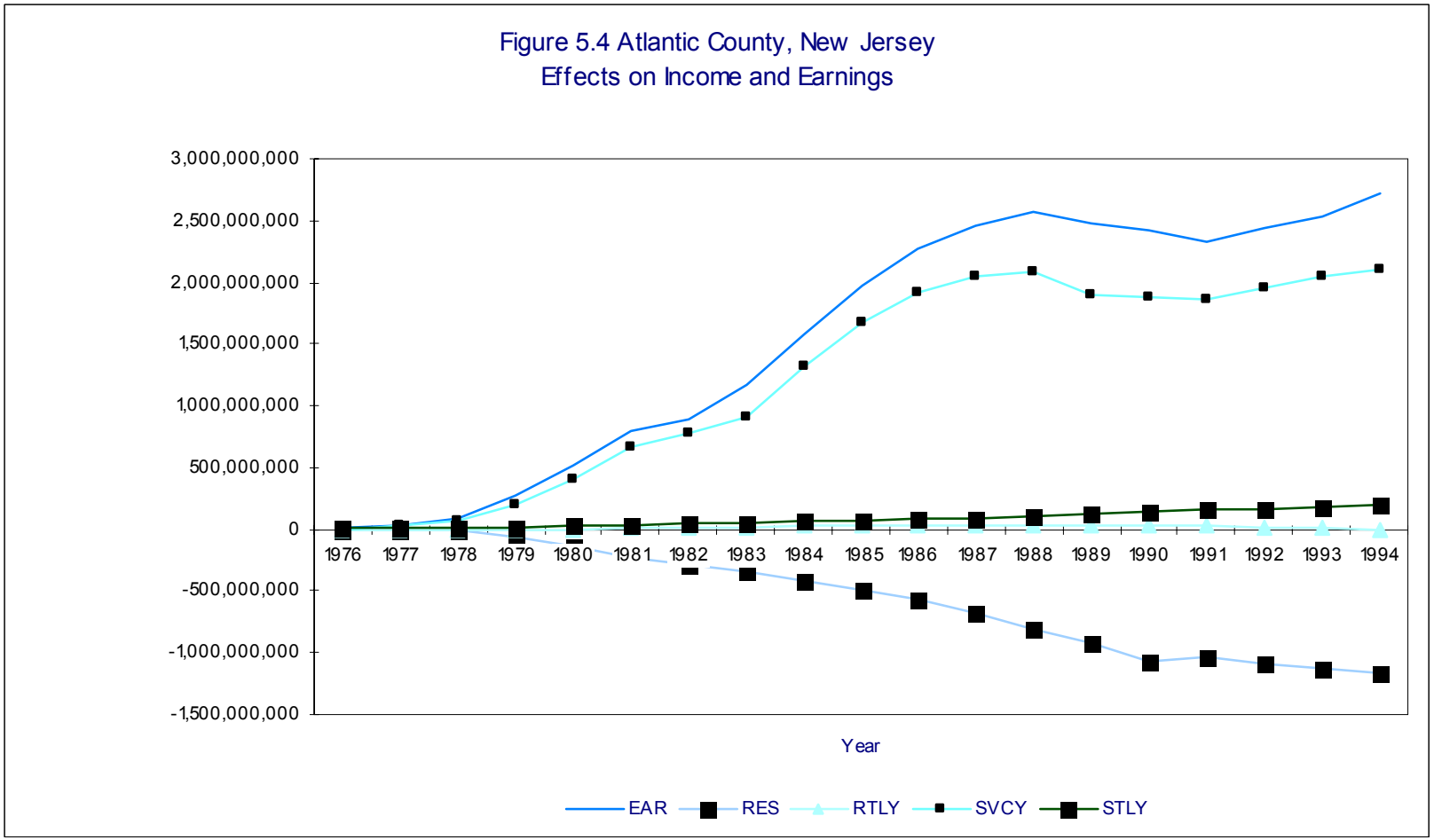


Figure 5.4 Atlantic County, New Jersey
Effects on Income and Earnings
3,000,000,000
2,500,000,000
2,000,000,000
1,500,000,000
1,000,000,000
500,000,000
0
-500,000,000
-1,000,000,000
-1,500,000,000
1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994
Year
EAR
RES
RTLY
SVCY
STLY

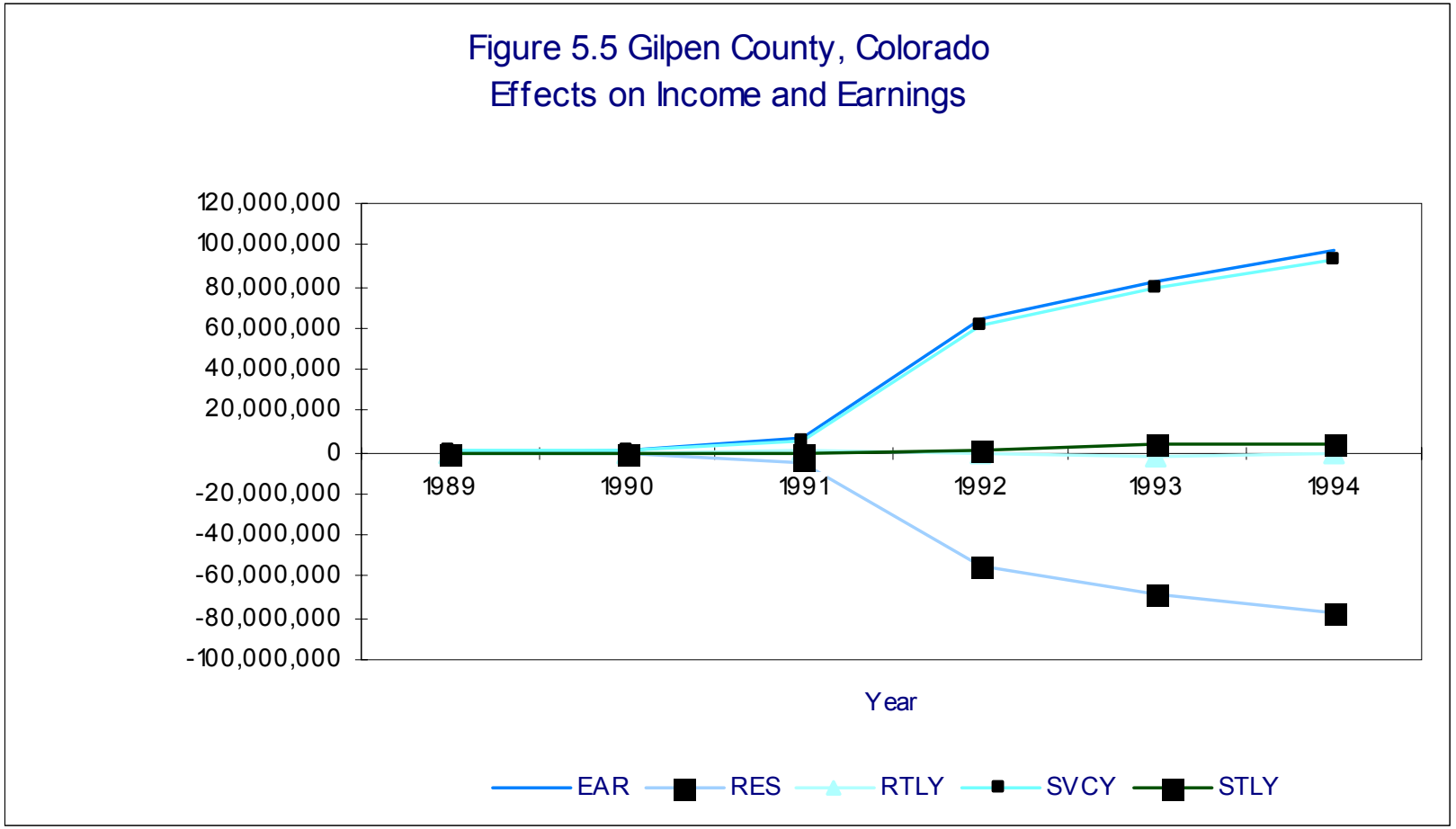


Figure 5.5 Gilpen County, Colorado
Effects on Income and Earnings
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
-20,000,000
-40,000,000
-60,000,000
-80,000,000
-100,000,000
1989
1990
1991
1992
1993
1994
Year
EAR
RES
RTLY
SVCY
STLY

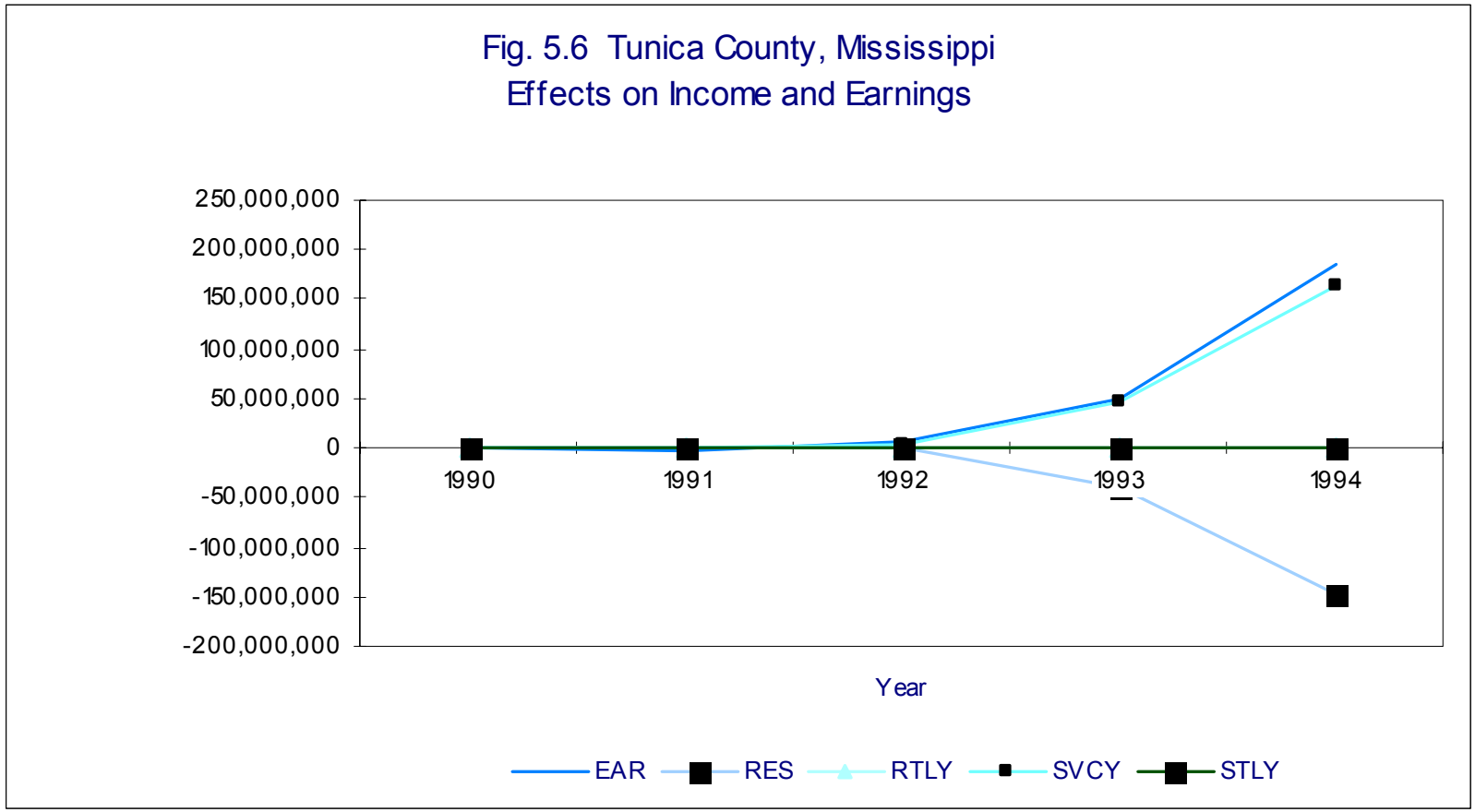


Fig. 5.6 Tunica County, Mississippi
Effects on Income and Earnings
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
-50,000,000
-100,000,000
-150,000,000
-200,000,000
1990
1991
1992
1993
1994
Year
EAR
RES
RTLY
SVCY
STLY

Figure 5.7 Atlantic County, NJ
Effects on Crime, 1978-93

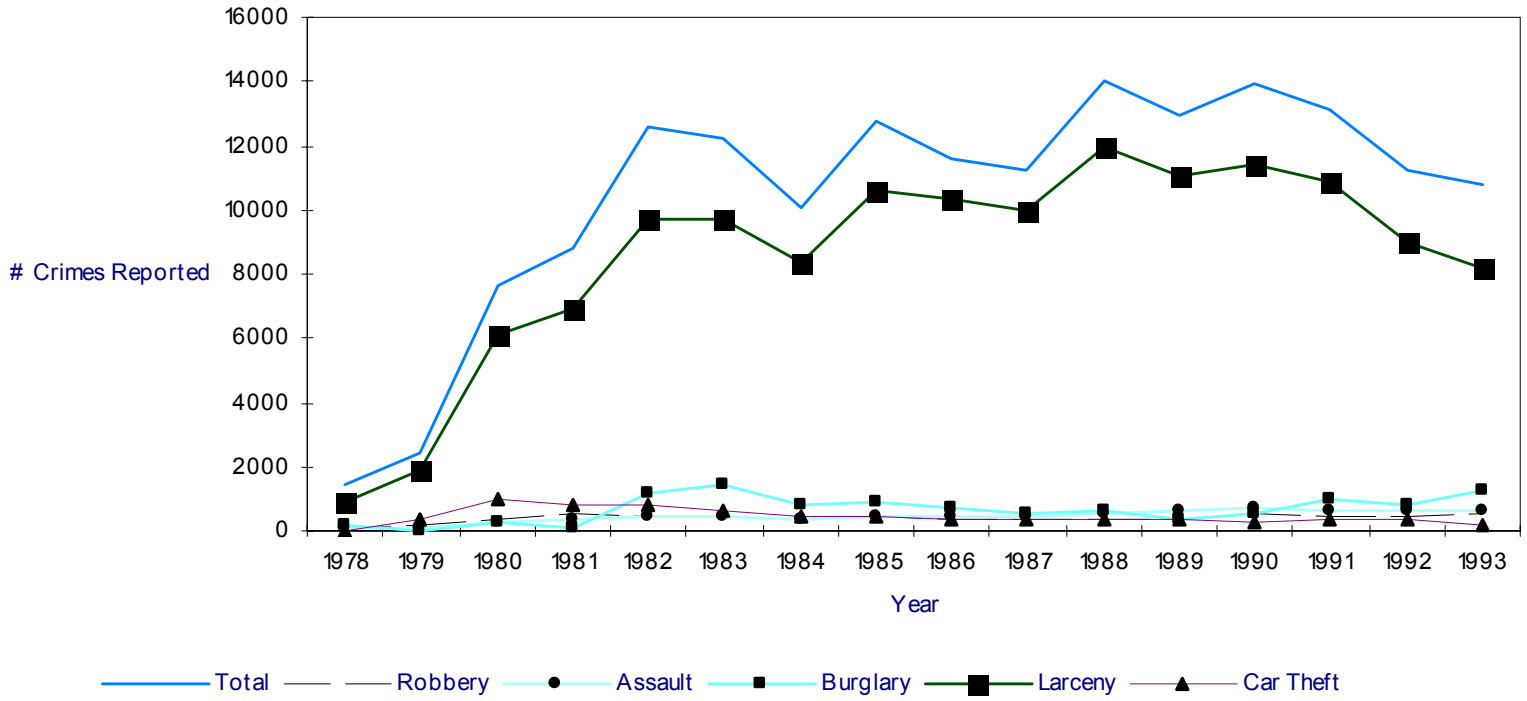
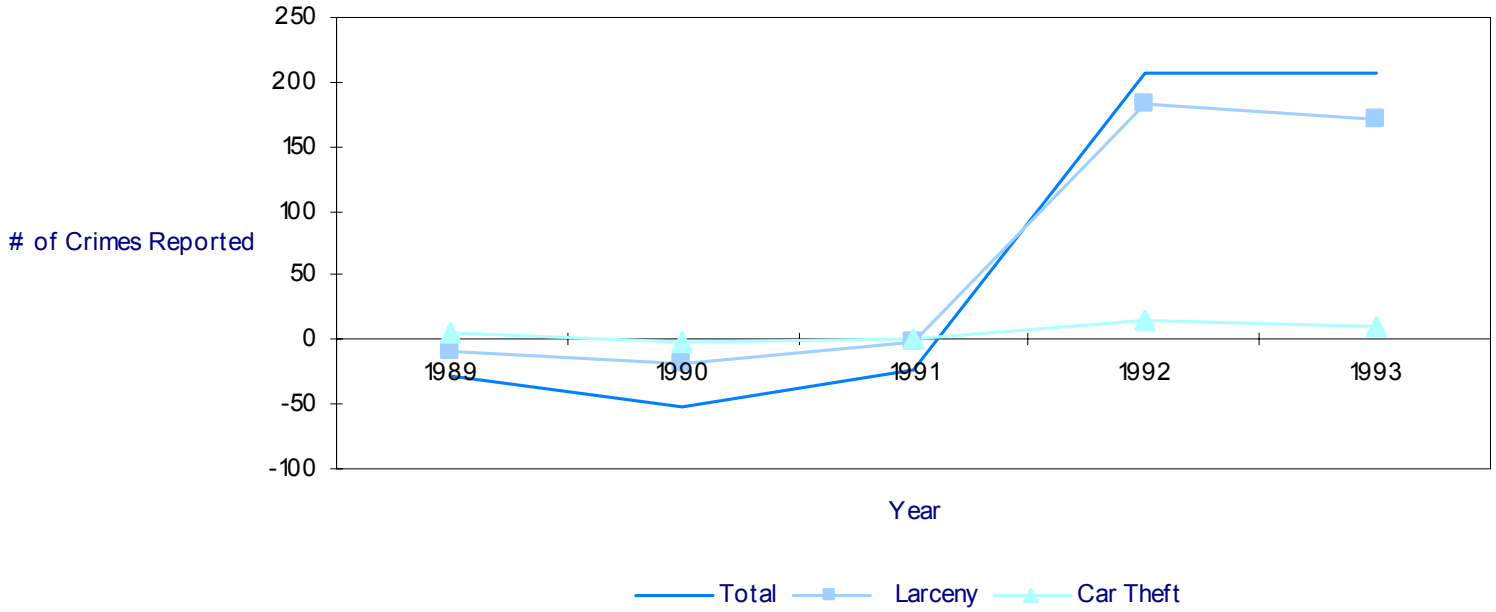


Figure 5.8 Gilpen County, CO
Effects on Crime, 1989-93



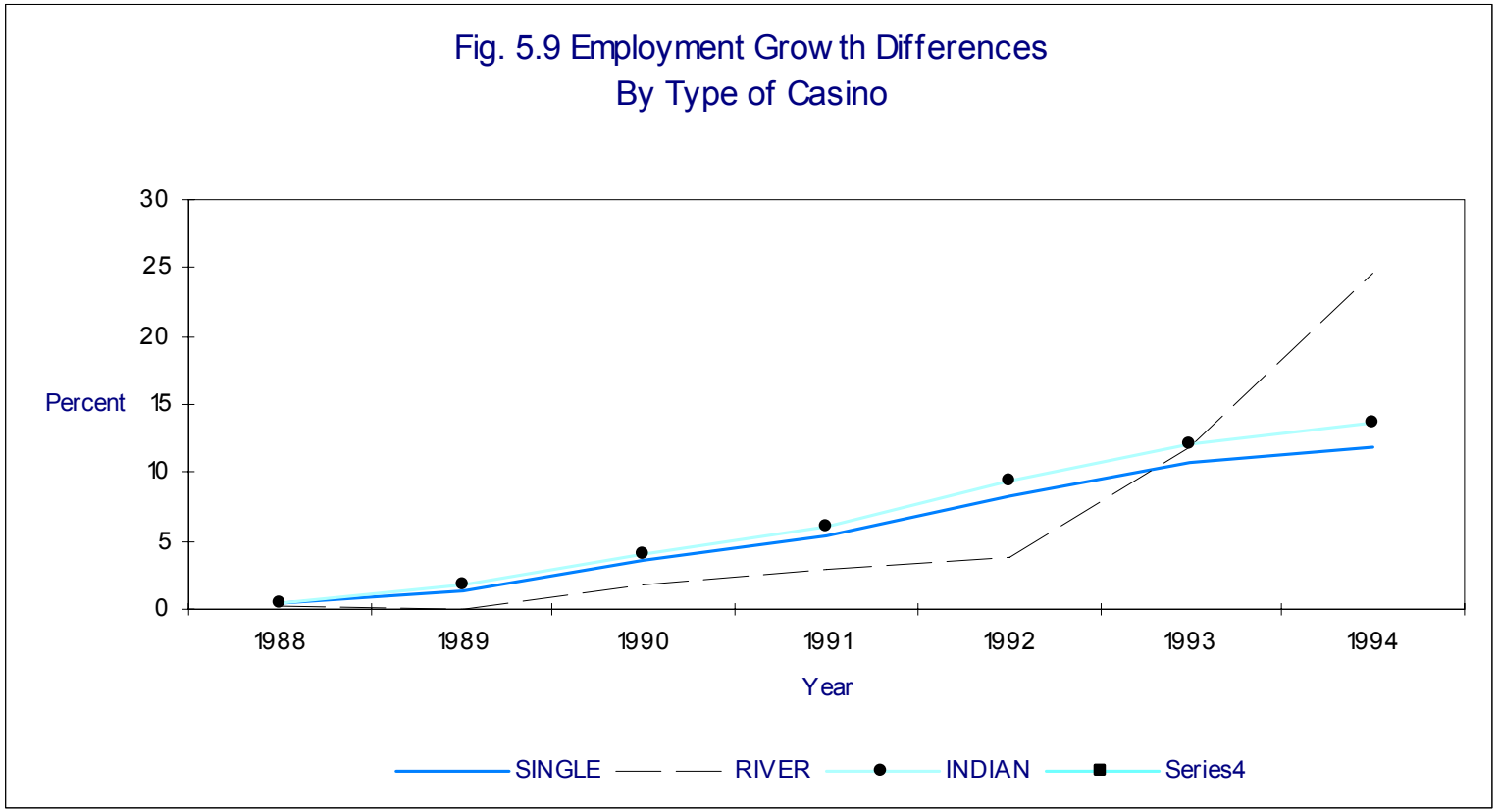


Fig. 5.9 Employment Growth Differences
By Type of Casino
30
25
20
15
10
5
0
Percent
1988
1989
1990
1991
1992
1993
1994
Year
SINGLE
RIVER
INDIAN
Series4