
Do New Generation Cooperatives Make A Difference?

*A Report Submitted to the
Wisconsin Center For Cooperatives*

Prepared by:

Curtis Stofferahn
Professor, Department of Sociology
Director, Center for Rural Studies
University of North Dakota
And
Linda Tinderholt, Research Associate
Social Science Research Institute
University of North Dakota

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Executive Summary

The Impact of New Generation Cooperatives:

In past years, many new generation cooperatives (NGC) have been established to achieve local ownership of enterprises, especially value-added agricultural processing facilities. In addition to increasing the returns to their farmer/investor members, other goals associated with this form of economic development include new income for rural residents, new jobs in rural areas, expanded markets and new and diversified agricultural products. Based on the industrial structure hypothesis from the sociology of industry literature as well as upon the organizational and philosophical basis of cooperatives, it is assumed that coops would result in different outcomes for individuals and communities than would investor-owned firms. It is generally assumed or hoped that value-added processing and NGCs would have positive impacts for employment and for communities. Among those impacts would be those that are employment related: Creating higher wage jobs, reducing unemployment, and providing new jobs in rural areas. Community related impacts would include: Reducing out-migration, improving quality of life, keeping profits in community, and adding to economic growth in the community

Methodology

The results of this study are based on financial, employment, educational and judicial data compiled for all counties in North Dakota for the years from 1990 to 2000. The twenty-eight counties in North Dakota that have been designated as farming dependent, together with Foster County, were included in this analysis. This analysis looked at the impact over time of the counties with NGCs compared to similar counties with no NGCs. The two counties with NGCs include Eddy County (North American Bison Cooperative) and Foster County (Dakota Pasta Growers Company). The North American Bison Cooperative and Dakota Pasta Growers Company were established during the 1990s.

Key Findings: Descriptive Analysis

Impact on Financial and Built Capital

Employment: The counties with NGCs – Eddy and Foster County – experienced the largest percentage increase in average annual employment and the smallest decrease in the labor force. These two counties also experienced the only increase in the number of persons employed and the percentage of persons unemployed decreased at a higher rate than the number unemployed in the comparison counties. The 2000 unemployment rate is higher in Eddy and Foster County, but these counties still had the largest percent decrease in the

unemployment rate. The lowest unemployment rate both in 1990 and 2000 was in the comparison counties, which decreased only slightly from 1990 to 2000. The number of firms dropped 5% in Eddy and Foster County and decreased 9% in the comparison counties.

Income, Wages, Taxable Revenue, Sales Tax Revenue: The average annual wage in the counties with new generation cooperatives increased at a rate double that of the comparison counties; however, the per capita income in the comparison counties increased 20% from 1990 to 2000 compared to 1% in Eddy and Foster County. The comparison counties had a larger percentage decrease in taxable revenue than did counties with NGCs, but still recorded a higher total taxable revenue value in 2000 than did Eddy and Foster County.

Building Permit Values: Building permit values in all counties increased dramatically, with increases of 225% in the comparison counties and 174% in Eddy and Foster County. Sales tax revenue fell in the comparison counties while increasing by 5% in Eddy and Foster County.

Poverty: Poverty rates decreased 32% in Eddy and Foster County and 31% in the comparison counties. The comparison counties, however, still have the highest poverty rate, 3.69 points higher than the counties with NGCs. All counties experienced decreases in the number of persons and households participating in the food stamp program. The largest percentage decreases in the number of persons and households occurred in Eddy and Foster County, which also had the largest percentage decrease in the value of the food stamps issued. The comparison counties experienced lower, but still significant, decreases.

Impact on Human Capital

Population: The comparison counties recorded a larger decrease in population, both in absolute number and in percentage of change, than did counties with new generation cooperatives, with the population in those counties decreasing by 11% compared to 5% in the NGC counties.

Public Schools: The counties with – Eddy and Foster County – experienced a smaller net decrease in public school enrollment, with the largest increase in the number of American Indian and Asian/Pacific Island students. These two counties also had the only increase in the number of high schools students continuing their education after high school. K through 12 school enrollments decreased 14% in all counties. Taxable valuation per pupil increased 45% in the comparison counties compared to 19% in Eddy and Foster County. Total general fund revenues were highest in counties with larger enrollments, and revenues increased by 25% in Eddy and Foster County and by 38% in the comparison counties. Cost per pupil increased substantially in the comparison counties (54%) compared to Eddy and Foster County, where the cost per pupil

increased only 18%. Student-teacher ratios increased at a higher rate in counties with NGCs, rising by 23%. The comparison counties have the lowest ratios at 14.0. Dropout rates are lowest in the comparison counties (1.04) and they are the only group of counties to experience a decrease in the dropout rate. The rate in these counties decreased 13%, compared to a 38% increase in Eddy and Foster County.

Impact on Social Capital

Property Crime: The changes in the incidence of property crime are mixed, with the number of burglaries decreasing by almost 40% in the comparison counties and increasing by a third in Eddy and Foster County. The number of larceny/thefts decreased 58% in Eddy and Foster County and 32% in the comparison counties. Motor vehicle thefts increased by a third in the comparison counties while dropping to zero in Eddy and Foster County (which had very small numbers of motor vehicle thefts in 1990). Total property crime fell 48% in Eddy and Foster County and 25% in the comparison counties.

Crime: Eddy and Foster County experienced a 94% increase in misdemeanors, while the other counties experienced an increase of 2%. Felonies, also, increased substantially in Eddy and Foster County, rising by 133% compared to 88% in the comparison counties.

Civil Court Cases: The number of small claims filed decreased only in the comparison counties, while increasing 26% in Eddy and Foster County. Eddy and Foster County also had the largest numbers of small claims and other civil cases filed in 2000. The number of other civil cases filed in all counties increased from 1990 to 2000. The number of cases filed increased 300% in Eddy and Foster County and 92% in the comparison counties.

Key Findings: Analysis of Mean Differences

Only five of the thirty five (14%) comparisons revealed that mean percentage change in indicators of financial/built, human and social capital in the counties with later new generation cooperatives were significantly different from the remaining farming dependent counties. Of these comparison none of the means for financial capital, the mean for the one measure of built capital, two of the means for measures of human capital, and two of the means for measures of social capital were significantly different between the two counties with later new generation cooperatives and the remaining agriculture dependent counties.

For Foster and Eddy counties, only one of the built capital measures (adjusted value of building permits), two human capital measures (adjusted cost per pupil, minority students except Native American), and two of the social capital measures (burglary and other civil court cases) were significantly different from the other farming dependent counties.

INTRODUCTION

In a response to declining farm prices in the 1980s, farmers in North Dakota organized a number of ventures to increase their share of the consumer food dollar through value added manufacturing through enterprises owned and operated by producers. The interest in these new generation cooperatives (NGCs) exploded such that in 1993 the then Commissioner of Agriculture, Sarah Vogel, called the phenomenon “coop fever”. In 1994, Lee Egerstrom identified 50 new or emerging cooperatives, 20 of them from North Dakota. Between 1993 and 1998, 67 new cooperatives had been created in North Dakota ranging in size from 15 to 2000 members with plant values ranging from several hundred thousand to \$261 million (Patrie, 1998).

By organizing as a cooperative, producer members could realize a market for their production, increased returns to their production not only through value added manufacturing but also through return of profits to the enterprise through dividends returned to the members. Secondary impacts of this form of enterprise organization would be the community impacts via job creation, an improved tax base, a growing population, increased sales at retail establishments, improvement and growth in housing stock, etc. The possibility of securing these secondary impacts enticed community development corporations to work closely with the organizers of new generation cooperatives by providing land, some capital, and infrastructure needed for the physical plants.

Community economic developers placed much hope on the possibility of realizing these secondary impacts of value-added manufacturing by new generation cooperatives. Egerstrom (2001) argued that community economic development is a by-product of cooperative development by NGCs. Whether the community economic development outcomes expected from these enterprises really occurred is still a researchable question. Although several case studies have tried to document the positive as well as negative impacts of individual new generation cooperatives, no systematic inquiry into these impacts has been attempted.

The paper begins with a review of the nature of new generation cooperatives. It continues with a brief history of both Dakota Growers Pasta Company and North American Bison Cooperative which are the focus on this research. A discussion of cooperative community development follows which sets out the general context for the discussion of the impacts of new generation cooperatives. A literature review includes relevant literature from industrial sociology, economic development and community change, and a review of case studies of new generation cooperatives. The methodology section includes definition and measurement of community capitals, a discussion of the unit of analysis, and a preview of the data analysis. The data analysis section is organized by the

results for financial and built capital, human capital and social capital. The last section includes a summary and conclusion.

NEW GENERATION COOPERATIVES

In addition to increasing the returns to their farmer/investor members, other goals associated with this form of economic development include new income for rural residents, new jobs in rural areas, expanded markets, and new & diversified agricultural products. These goals are achieved because of the ability of cooperatives to create economies of scale and raise equity to capitalize the business (Northern Great Plains Rural Development Commission Work Group on Value-Added Farming, 1997).

The most important characteristic of these NGCs that distinguishes them from traditional cooperatives is their focus on value-added rather than commodities. Members sell the commodities grown on their farms to their cooperative which then processes them into a finished product. Profits from the cooperative are redistributed back to the members in proportion to the commodities delivered. Value-added products are the focus of these coops because their return to producers-members is higher than is the return on raw commodities. In addition, NGCs often focus their attention on niche markets to receive additional value. Once they locate a niche market and determine the total demand for a year for that market, NGCs restrict membership so that supply does not exceed demand.

Dakota Growers Pasta Company¹

The idea of organizing a durum processing cooperative probably began when the state economic development commission had tried unsuccessfully to recruit a large pasta cooperative to the state. In mid-1990, interested parties from the state rural electric cooperative association, a regional rural electric cooperative, a regional planning council, two prominent farmers and members of the state legislature and a durum growers association met to discuss the formation of a cooperative. This group authorized a feasibility study and secured funds from a variety of private and public sources. Later they organized a steering committee comprised of all principle contributors to the feasibility study was organized, and this steering committee became the interim board of the cooperative. In 1992 after 33 equity drive meetings conducted by the chairperson of the board, the executive director of the cooperative, and other key personnel, 1200 durum farmers from North Dakota, western Minnesota, and eastern Montana had pledged \$12.5 million in equity towards a \$40 million durum mill and pasta plant. The remainder of the financing was secured through the St. Paul Bank of Cooperatives, the Bank of North Dakota, and rural electric cooperatives. In 1992 Carrington was selected as the site for the \$40 million, 3.2 million bushel plant capable of producing 120 million pounds of pasta. At full production by 1995, the cooperative doubled its capacity in 1996 and added another production line in

¹ Creating Co-op Fever: A Rural Developer's Guide to Forming Cooperatives, 1998.

1997. Even with that expansion, demand still exceeded capacity, so in 1998 the cooperative purchased Primo Piatto from Borden with included its two production plants in Minnesota. The cooperative had another stock offering to raise equity to purchase the company and to finance a doubling of the milling capacity to provide enough semolina for the two new plants. Although the first year (1994) had a negative .05 earnings per share, from 1995 through 2000, earnings per share were positive for six years, after which they became mixed.

North American Bison Cooperative²

In the late 1980s, bison ranchers began if their industry was to grow, they would need a central processing and marketing organization with strict quality control standards. They decided that a cooperative could be the vehicle to service markets on both the west and east coasts, urban centers, and in Europe, and it would also coordinate the supply of bison adequate to provide minimum amounts of high quality meats to consumers demanding minimum volumes of bison meat. In 1993, 147 bison producers formed the North American Bison Cooperative (NABC) and sold shares on a one share equal to the privilege of delivering one head of bison annually to the cooperative. Altogether, they sold 5000 shares and raised \$1 million in equity subscriptions to capitalize a slaughter facility designed and constructed to meet EU specifications. The cooperative built a \$1.6 million processing plant in New Rockford, North Dakota with capacity of eventually processing 10,000 head per year. By 1996, the cooperative slaughtered 4,500 bison bulls a year and had retail sales exceeding \$8 million. The cooperative now has 239 producer members from fourteen states and four provinces. It gradually expanded to full capacity of 10,000 head a year. The cooperative buys and processes the bison produced by members, and markets the fresh and specialty meats into Europe and upscale restaurant trade on the east coast. It is the only USDA and EU approved bison processing facility in the US.

COOPERATIVE DEVELOPMENT & COMMUNITY DEVELOPMENT

Flora et al. (2004: 350) define community development as “what people do to improve the overall quality of community”. Nadeau and Thompson (1996: 7-7) define cooperative development as “a group of people forming an organization to provide themselves with specific economic or social benefits”. The main difference between cooperative development and community development consists in that the purpose of community development is to improve the well-being of the community whereas the purpose of cooperative development is to organize a member-controlled organization designed to meet the needs of members.

² New Generation Cooperatives: Responding to Changes in Agriculture, 1997
Creating Co-op Fever: A Rural Developer’s Guide to Forming Cooperatives, 1998.
Commercial Bison Production in the Northern Plains, 1997

Nadeau and Wilson (2001: 65) combine these two terms into cooperative community development which they define as “a process in which member-controlled organizations develop and operate to achieve the goals of their members and the broader social and economic goals of the community”. The major difference between the terms is that community development includes a community impact analysis as an inherent part of the development process which would assess externalities, which may be either positive and negative, that might occur from the development and which affect the local community. The outcome of that process would be to maximize the positive externalities and minimize the negative externalities.

Nadeau and Wilson (2001: 65) suggest that during the process of cooperative community development, “cooperative organizations and projects are evaluated in terms of the extent to which they have a positive, sustainable impact on the environment, the economic and social well-being of those directly involved in the organization or project, and the community”. This assessment process is similar to the questions that Flora (1999: 21) suggests that leaders should ask themselves in determining whether community development projects have been successful. Included among those questions are the following: Have they have increased the skills, knowledge and ability of the residents; have they strengthened relationships and communication within the community; have they improved community initiative, responsibility and adaptability; have they promoted sustainable, healthy ecosystems with many community benefits; and have they promoted a diversified and healthy economy?

These five areas refer to the assets or capital available to a community. Capital can be broadly conceived as the range of resources available to a community which, when invested, create new resources (Flora, 1999). An increase in the quantity or quality of a community’s capitals can be an outcome of community development. Green and Haines (2003: vii) define community development “as a planned effort to produce assets that increase the capacity of residents to improve their quality of life. These assets may include several forms of community capital: physical, human, social, financial, and environmental”.

LITERATURE REVIEW

Industrial Structure and Community Capital

Based in the sociology of industry literature, the industrial structure hypothesis maintains that different industrial structures result in different socioeconomic outcomes (Bartik and Eberts, 1999; Hodson, 1984). The sociology of industry literature distinguishes between core and peripheral sector industries. Core sector industries are characterized by capital insensitivity, unionization, large assets, high profit margins, product diversification, and market concentration. Peripheral sector industries are the exact opposite of core sector industries (Bluestone, et al., 1973). The hypothesis argues that the economies of

communities reliant on core sector are vibrant, growing, prosperous, and technologically advanced; whereas economies in communities reliant on periphery industries are erratic, moribund, dependent on unskilled labor, and impoverished. Typically, researchers place food processing within the peripheral sector (Beck et al., 1978, Bib and Form, 1977) although others place it in the core sector (Hodson, 1977). Related research suggests that local control of an economy encourages a greater commitment to equitable relationships and community well being (Gunderson et al., 1996). Locally owned businesses would include owner operated businesses. Presumably, member-owned, new generation cooperatives would fall within this category.

Economic Development and Community Capital³

While the communities in Foster and Eddy counties where the processing facilities associated with the new generation cooperatives can hardly be called “boomtowns”, the research conducted about the impacts of energy development on the quality of community life may be instructive in analyzing the impacts of cooperative development on community capitals. The predominant conclusion from the boomtown literature is that rapid population growth associated with energy and mineral development causes social disruptions, cultural conflicts, and pathological behaviors. The social pathologies associated with energy development include increases in depression, school drop-out rates, juvenile delinquency, criminal activity, welfare caseloads, drunkenness, suicide attempts, child abuse, and teenage rebellion. Some researchers blame these social pathologies on the failure of the community to absorb the increased demand for goods and services resulting in both organizational and personal strain.

Some researchers noted weaknesses in the boomtown research and argued for a more cautious analytic approach. They have pointed out the inadequacies of the data bases from which the research had been conducted and alleged that the research involved an implicit antigrowth bias from classical sociological theories. Methodological inadequacies in the boomtown research were noted by other researchers. Some noted that the relationship between growth and social pathologies disappeared when the effects of other explanatory variables were controlled. Others researchers warned about careless interpretations of boomtown statistics noting the huge increases due to small bases. A dramatic increase in a social pathology may result from an increase in a few cases. Some have noted that the social pathologies in boom towns may be affected by both the rate of growth and community size which should be considered separately. Other methodological problems include double counting of social pathologies resulting from different agencies reporting on crisis events rather than on the same individual. This occurs most frequently in reporting by local social service agencies or in official crime reports. Finally, some noted that much social support in communities was provided informally through family, kin and

³ This section draws heavily on Summers, Gene F. and Kristi Branch, Economic Development and Community Social Change. *Annual Review of Sociology* 1984 10: 141-166.

neighbors; but with increased population size this function shifted to more formally organized structures. When this occurs, agencies begin to collect statistics to justify their funding and to maintain public accountability. This makes it difficult to determine whether the increases in social pathologies noted are actual increases or are artifacts of the record keeping process.

New Generation Cooperatives and Community Capital

Nadaeu and Wilson (2001) reviewed three case studies of new generation cooperatives to determine their positive and negative community impacts. The three NGCs were the Coulee Region Organic Produce Pool (CROPP), ValAdCo, and Dakota Growers Pasta Company.

Located in the poor, southwest corner of Wisconsin, CROPP specializes in processing and marketing organic foods under the Organic Valley label. The majority of its revenue comes from dairy products but it also markets eggs, produce and meat. As of 1998/1999 it had 175 members, 80 employees, and sales of \$40 million. CROPP has been a blessing to the regional economy and is the largest employer in LaFarge, Wis. Its positive environmental, community, and economic impacts include support for organic farming, family farms, and small scale production facilities. The only minor negative impact has been some resentment and skepticism towards the coop expressed by neighboring conventional farmers..

Based in Renville, Minn., ValAdCo is a swine production cooperative that raises breeding stock and commercial hogs. As of 1998 it had 120 members, 65 employees, and \$23 million in sales. The members benefit by having a market for 500,000 bushels of corn and soybeans that they sell to the coop at greater than market prices. The area's low unemployment rate is explained by the employment available at ValAdCo whose wages and benefits are higher than those of area businesses. It and other regional NGCs have been credited with reducing youth migration by creating employment opportunities. Community businesses have also benefited from the added income to producer members and employees. Environmental pollution from the high concentration of pigs and the disposal of hog waste are the major negative community impacts. Neighbors have complained about the hog odor since the facilities opened. The facility is also the source of a serious health hazard that has resulted in ValAdCo being cited 46 times for exceeding the Minnesota hydrogen sulfide emission standard.

Dakota Growers Pasta Co. is credited for the economic and population turnaround in Carrington, North Dakota and the region. Population in Carrington has stabilized which has also stabilized the enrollment in the school system. Farmers' and employees' increased incomes have resulted in increased expenditures in the community. The presence of the coop has been an attraction for other businesses to locate in the area. The case study did not identify any negative impacts.

In their summary of the positive impacts, Nadeau and Wilson (2001) stressed the benefits that derive from local ownership and control including higher producer incomes, better paying jobs, increased sales by local retailers, secondary employment impacts, greater tax base, business expansions, and the establishment of new jobs in the community. The social benefits include a sense of leadership and confidence that carries over to other community activities, increased community pride, and increased satisfaction with their community and their lives. The negative impacts can include environmental degradation. Because these ventures can fail, negative impacts can include investment losses, loss of markets for producer members, and negative multiplier effects.

Summary of Impacts on Community Capital

From a review of the research from industrial sociology, economic development and community change, and impacts of new generation cooperatives, the following impacts of new generation cooperatives on financial, built, human, social, and natural capital may occur:

Financial: Communities with new generation cooperatives will experience generally positive impacts on financial capital including higher producer-member incomes, increased employment, better paying jobs, more technologically-advanced and skilled employment, increased sales for community businesses, new, an expanding tax base and relocated and expanding businesses.

Built: Communities with new generation cooperatives will experience direct and secondary positive impacts on built capital. These direct impacts will include cooperative's new physical plant. The secondary impacts will occur as a result of new construction, renovation and remodeling of new, expanding and relocating firms; and new home construction and home renovation for the new workforce; and construction for new and expanding public facilities.

Human: Communities with new generation cooperatives will experience positive and negative impacts on human capital. The positive impacts will include population growth or stabilization, increases in skill levels of the work force, reduced youth out-migration, and stabilization of school enrollments. The negative impacts will include pathological behaviors such as increases in depression, drunkenness, suicide attempts, child abuse; and increases in school drop out rates, welfare caseloads, and teenage rebellion.

Social: Communities with new generation cooperatives will experience positive and negative impacts on social capital. The negative impacts will include social disruptions, such as increases in juvenile delinquency and criminal activity. They may also include resentment and skepticism towards the new cooperative by non-members. The informal mechanisms of dealing with social problems may be replaced by more formal mechanisms. The positive impacts will include an

increased sense of leadership and confidence, increased community pride, and increased satisfaction with the community and their own lives,

Natural: The impacts on natural capital may include environmental degradation from disposal of wastes.

METHODOLOGY

Community Capitals: Definition and Measurement

Operationalizing the measures of community capital draws upon the work of Flora (1999) in her analysis of the impacts of corporate hog farming. The measures are based upon data collected at the county level from a variety of federal and state sources. Data on environmental capital was unavailable, so this analysis will be confined to human, social, and financial/built capital. A complete list of all the data collected, together with the source of the information, is included in Appendix A. Financial data was standardized to constant dollars. For all measures, a change score was calculated to indicate the extent to which the measure had changed between 1990 and 2000.

Any attempt to use existing, secondary data to measure the community capitals concepts resulted in problems of data collection, data accessibility, and data completeness. Finding databases that provided county-level data for each of the ten years of the study was difficult. Some agencies do not collect data annually. City police and county sheriff departments either did not report their Uniform Crime Report data to their on a regular basis or had no data to report. Job Service of North Dakota groups data differently within a county within a particular year, and it groups data differently across counties in the same year in order to avoid divulging information that would uniquely identify the only industry within an industrial category at the county level. Because of the confidentiality of the data, Job Services would not release the ungrouped data for purposes of analysis. Unfortunately, the inaccessibility of the county level data on covered employment, wages, and firms by industry resulted in a loss of data that would have been very helpful to the analysis. School districts do not report data at the county level, however, researchers at the Department of Public Instruction were able to disaggregate and reassemble the district level data into county level data.

Human capital refers to the characteristics of “individuals that contribute towards their ability to earn a living, strengthen community, and contribute to community organizations, to their families, and to self improvement” (Flora et al, 2004: 80). It is composed of the characteristics and potentials of individuals that are determined by genetics (nature) and those determined by interactions with other people and the environment (nurture). The components of human capital include the health status, strength and stamina of the labor force; the interpersonal skills, values, and leadership capacity of individuals; and the skills, education, experience and knowledge of the population.

One indicator of human capital is population size; the greater the population base the greater the pool of human capital. Population diversity is another aspect of human capital; the greater the diversity of the population, the greater the potential for diverse perspectives and ideas in human capital. In this analysis, change in population size, change in total school enrollment, and change in school population diversity are used as measures of the size and diversity of human capital.

Education – both primary and secondary -- is one major way in which a community invests in human capital. The greater the extent to which a community invests in human capital development, the greater the skills, knowledge and experience available to that community. In regard to education as a component of human capital, both inputs and outputs are important. In regard to outputs, one can examine the change in the number of high school graduates, the change in the number of high school dropouts, change in the student teacher ratio. Other output measures would be actual changes in basic skills and knowledge, but that data was not easily obtainable. Input measures indicate the extent to which a community invests in human capital. Indicators of these input measures include changes in adjusted taxable valuation per pupil, adjusted total school revenue, and adjusted cost per pupil.

Social capital can be characterized as a property of the community and is usually defined in terms of norms of reciprocity and mutual trust (Coleman, 1988). Putnam (1933: 35-36) further defines it as “features of social organizations, such as networks, norms and trust, that facilitate coordination and cooperation for mutual benefit. Social capital enhances the benefits of investment in physical and human capital.” Because social capital is a property of the community that resides in relationships, it is difficult to measure directly. However, indirect but objective measures of individual security related to crime and the degree of acrimony in the community are possible. These are indicators of mutual trust, reciprocity, shared norms and identity (Flora, 1999). An increase in civil court cases (small claims cases, other civil cases) would reflect an increased level of acrimony in the community and demonstrate a lack of trust and decreased communication. An increase in property crime reflects a decline in traditional measures of social control relative to individual security. An increase in civil court cases and in property crime involve disagreements among citizens regarding such issues as property conflicts and personal injury. They are not criminal acts but are disputes that are eligible for resolution through the formal legal system.

Financial capital consists of money that is used for investment rather than consumption, and it represents resources that are translated into monetary instruments that makes them highly liquid, i.e. able to be converted into other assets (Flora et al, 2004: 165). Investment means using a purchase or a financial instrument to create additional value (Flora et al, 2004: 9). Financial capital includes debt capital, investment capital, tax revenue, savings, tax

abatements, tax credits, and grants (National Rural Funders Collaborative, 2005).

Financial capital is often privileged because it is easily measured, and it is often the means by which other capitals are accessed. Financial capital can be invested in built capital (i.e., physical infrastructure), human capital (i.e. education and training), natural capital (i.e. land), cultural capital (i.e. recuperation of traditional designs), social capital (i.e. meetings and electronic connectivity access), and political capital (i.e. campaign contributions, travel to meetings with key officials) (National Rural Funders Collaborative, 2005). In this analysis, financial capital is measured by changes in employment (changes in average annual employment, number unemployed, unemployment rate, and size of the labor force), changes in income (BEA adjusted income, adjusted per capita income), changes in poverty (changes in poverty rate, households with food stamps, persons on food stamps, adjusted issuance of food stamps), and changes in revenue from firms (adjusted taxable revenue).

Built capital provides a supporting foundation that facilitates human activity. It is the permanent physical installations and facilities supporting productive activities in a community (Flora, et al., 2004). It is also used as tools for production of other capitals. It includes transportation networks, communication systems, utilities, protective services, educational and health facilities, and public and commercial buildings. Built capital occurs when financial capital is transformed into physical infrastructure which contribute towards building other capitals. Physical infrastructure refers to “permanent physical installations and facilities supporting productive activities in a community”, and it refers “to the equipment needed to support a series of networks that enable people to travel, communicate with each other, and gain access to services and markets” (Flora et al, 2004: 191). Built capital was measured by change in adjusted value of building permits and in change in the number of business establishments.

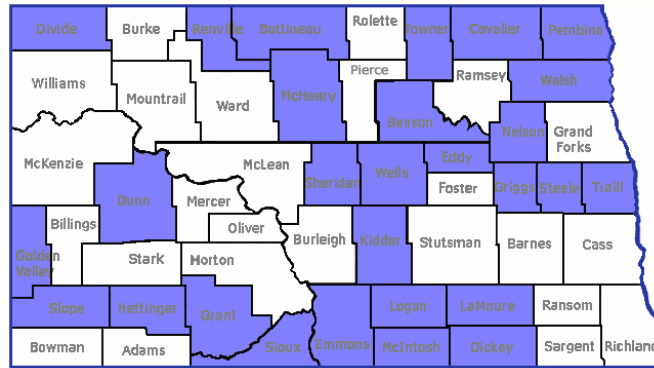
The data for this research was compiled from financial, employment, educational and judicial data compiled for all counties in North Dakota from a variety of secondary sources for the years from 1990 through 2000 (sales tax revenue for the years 1991 through 1999). A complete list of all the data collected, together with the source of the information, is included in Appendix A. Means were calculated for all variables for 1990 and 2000 (1991 and 1999 for sales tax revenue), and differences in means and percentage changes were calculated. The dollar variables for each year for each county (total wages, average wages, per capita income, tax revenue, sales tax revenue, building permit value, income, food stamp issuance, taxable valuation per pupil, total revenue and cost per pupil) were adjusted into constant dollars to allow for inflation.

Unit of Analysis

Twenty-eight counties of the fifty-three counties in North Dakota are designated by the US Department of Agriculture (ERS, 1989) as farming dependent counties, shown in blue in Figure 1.

Counties Included in the Analysis

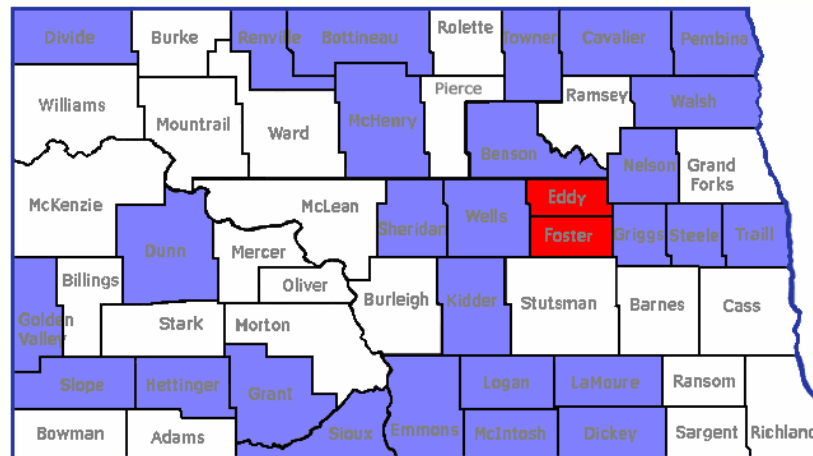
Figure 1. Farming Dependent Counties in North Dakota



These farming dependent counties include: Benson, Bottineau, Cavalier, Dickey, Divide, Dunn, Eddy, Emmons, Golden Valley, Grant, Griggs, Hettinger, Kidder, LaMoure, Logan, McHenry, McIntosh, Nelson, Pembina, Renville, Sheridan, Sioux, Slope, Steele, Towner, Traill, Walsh and Wells. Only one of the two more recently established NGCs is located in a farming dependent county, the North Dakota Bison Cooperative in Eddy County, established in 1994. One non-farming dependent county will be part of this analysis: Foster County, Foster County is the home county of the Dakota Pasta Growers Company, established in 1993.

The two NGC counties are Eddy County (North American Bison Cooperative at New Rockford) and Foster County (Dakota Growers Pasta Company at Carrington) Eddy is also designated as farming dependent counties, but Foster County is not.

Figure 2. Comparison Counties/NGC Counties



Research Design

In order to examine the impact of new generation cooperatives on community capital, a retrospective quasi-experimental design was used. Some common characteristics of quasi-experimental designs include the following: Experimental groups are matched to comparison groups; they use time series data; and the unit of analysis is often other than people. The most commonly used quasi-experimental design is the non-equivalent design. It requires a pre-test and a post-test for a treatment and comparison group. In these designs, statistical control is substituted for the absence of physical control of the experimental situation. The use of a retrospective, quasi-experimental design, however, means that the measured changes cannot all be attributed to the treatment. There may be unmeasured characteristics of the counties being examined that may account for some or all of the differences in outcomes between the counties with new generation cooperatives and counties without new generation cooperatives.

In order to determine whether changes in the counties with new generation cooperatives were due to their presence, considerations of time order, co-variation, and elimination of alternative causal factors are required. Concerning time order, the presence of the new generation cooperatives must occur before the impacts analyzed. Regarding co-variation, the change in conditions must be measured from before and after the location of new generation cooperatives in their respective counties. Finally, other causal factors which might explain the changes in conditions in the new generation counties must be considered. However, it is not possible to eliminate rival causal factors as there are an infinite number of other events that could account for the observed changes.

The first section of this analysis compares means, differences in means and percentage change in means for counties with new generation cooperatives and for the remaining farming dependent counties in North Dakota. The second section involves a comparison of the means for the measures of community capitals between the new generation cooperative counties and the agriculture dependent counties to determine whether the observed differences in means in the two groups were significantly different.

SECTION I – DESCRIPTIVE ANALYSIS

Particular attention was paid to the differences in the rate of change over time and whether it was positive or negative, and how the percent change in a measure of community capital in the counties with new generation cooperatives compared to the percent changes in the other farming dependent counties. A conclusion section summarizes the major differences found over time between the counties with new generation cooperatives (Eddy and Foster County) and the comparison counties.

Changes over time within and between counties with new generation cooperatives are compared in this section of the analysis. This study compares means from the two counties containing recently established new generation cooperatives (North American Bison Cooperative in Eddy County and Dakota Growers Pasta Company in Foster County) to means from the remaining farming dependent counties.

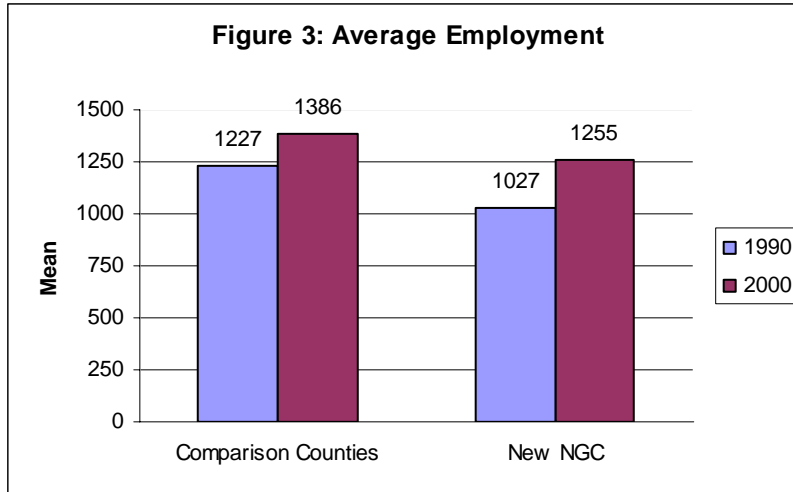
The analysis compared changes in the NGC counties over time (1990 and 2000) and also compared these counties to counties with similar economic bases. The measures selected covered three types of capital – financial, human and social.

Impact on Financial Capital

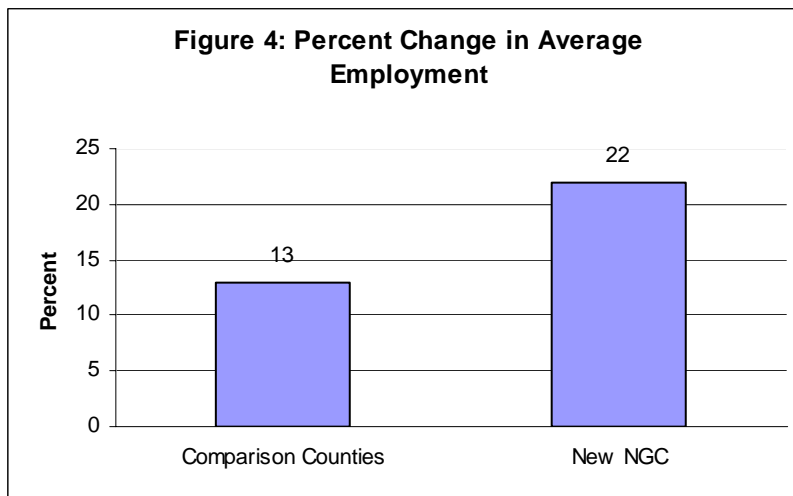
Means, difference in means and percentage of change were calculated for the years 1990 and 2000 (1991 and 1999 for sales tax revenue) for each group of counties for the following indicators of financial capital: employment, income, taxable revenue, building permit value, sales tax revenue and poverty.

Employment

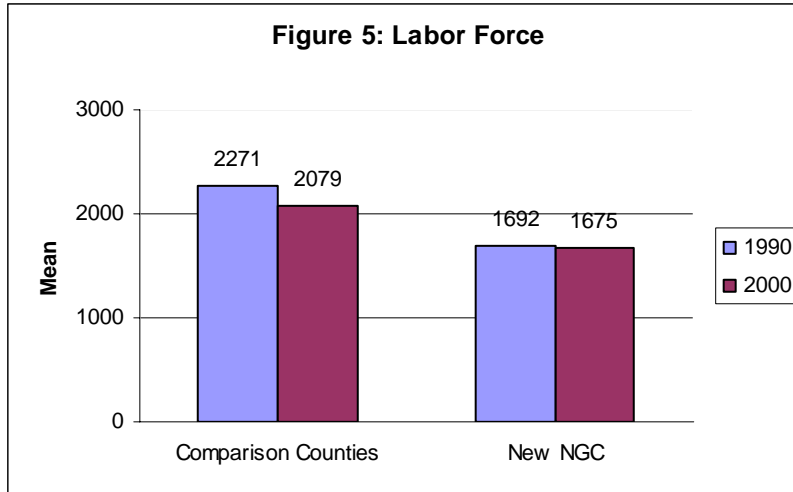
Jobs. The average annual employment for counties with new generation cooperatives did increase from 1990 to 2000, as did the average employment in the comparison counties (Figure 3).



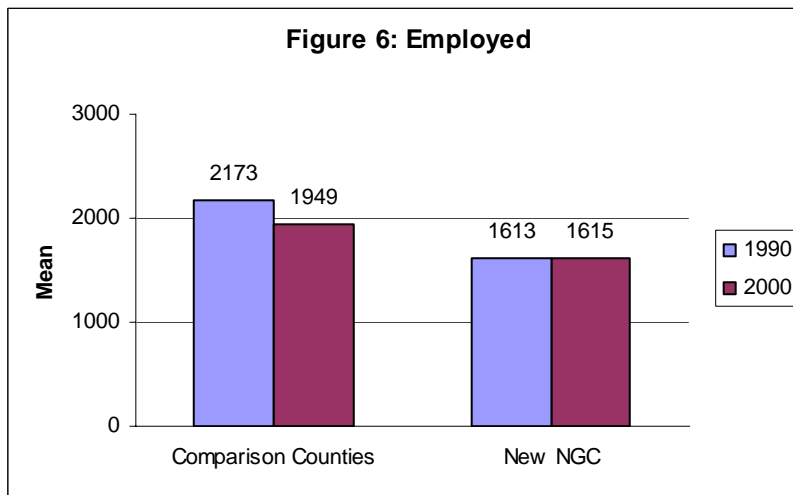
Employment increased by 228 in Eddy and Foster County, an increase of 22%, while the average employment increased by 159 (13%) in the comparison counties. Overall, average employment in the NGC counties increased by 18%. The percentage increases for each group of county is shown in Figure 4.

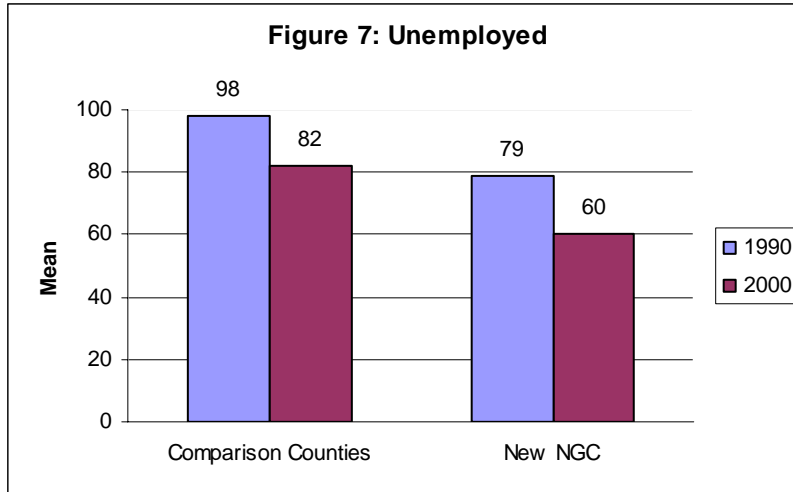


Labor Force. The comparison counties also experienced a larger decrease in the labor force, falling 8% in these counties compared to 1% in the counties with NGCs (Figure 5).

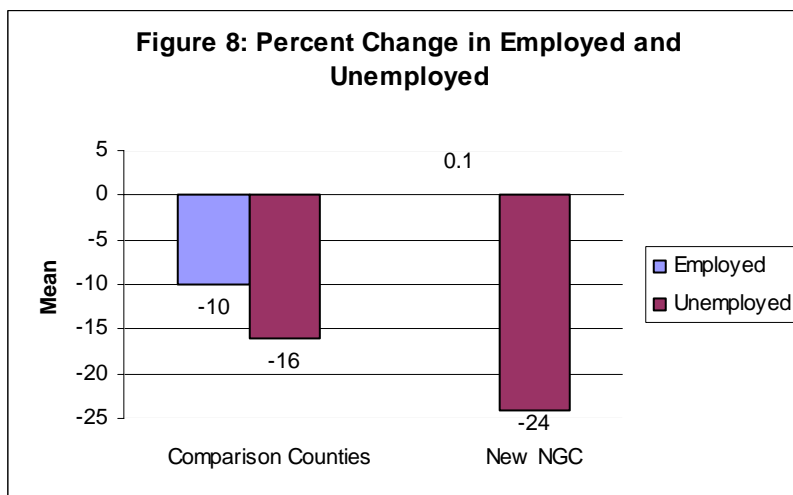


Employed, Unemployed. The number of persons employed increased slightly in Eddy and Foster County (0.1%) and decreased by 10% in the comparison counties (Figure 6). The number of persons unemployed in the comparison counties decreased by 16% and decreased by 24% in the counties with NGCs (Figure 7).

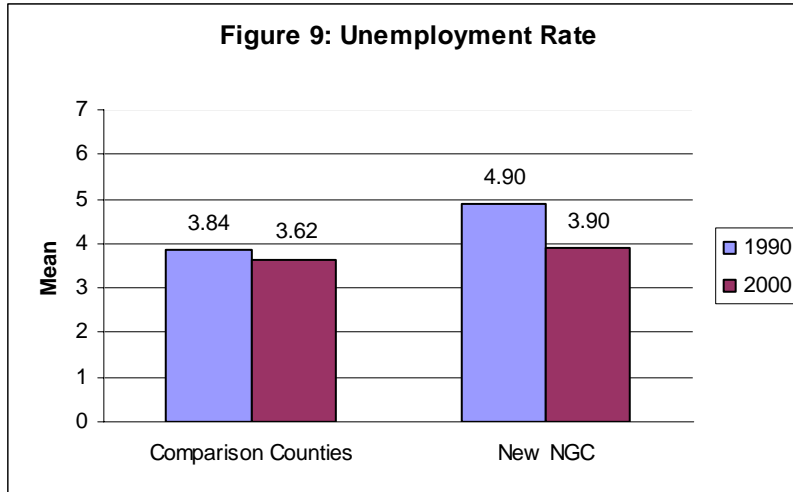




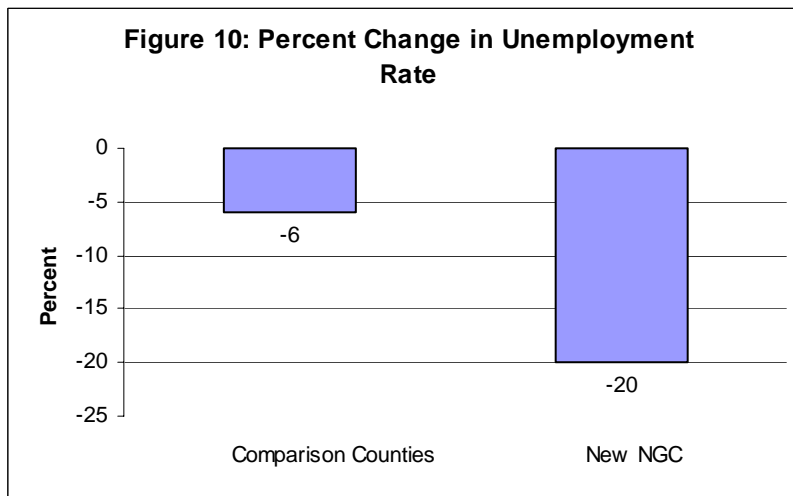
The percentage change in the counties with NGCs and those without in the number of persons employed and unemployed is shown in Figure 8.



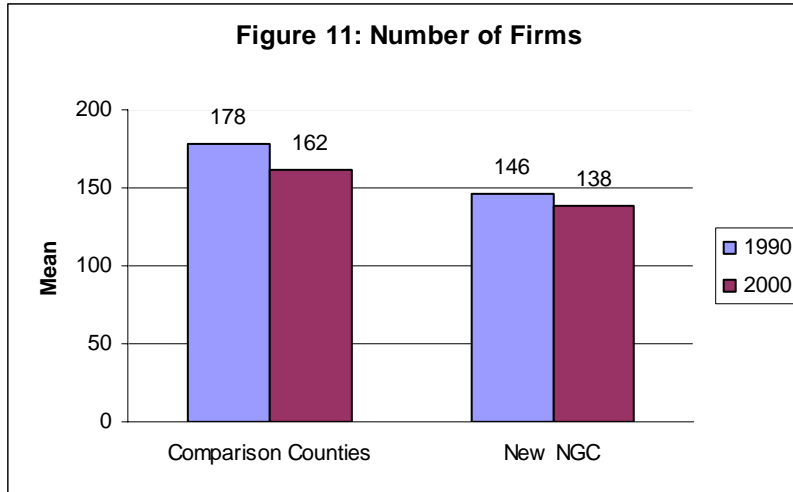
Unemployment Rate. The unemployment rate in Eddy and Foster County fell by 20%, from 4.90 to 3.90, while the unemployment rate in the comparison counties fell by 6%, decreasing from 3.84 to 3.62 (Figure 9). This rate for the comparison counties, however, is still lower than the unemployment rate in Eddy and Foster County.



The percentage decreases in the employment rate are shown in Figure 10.

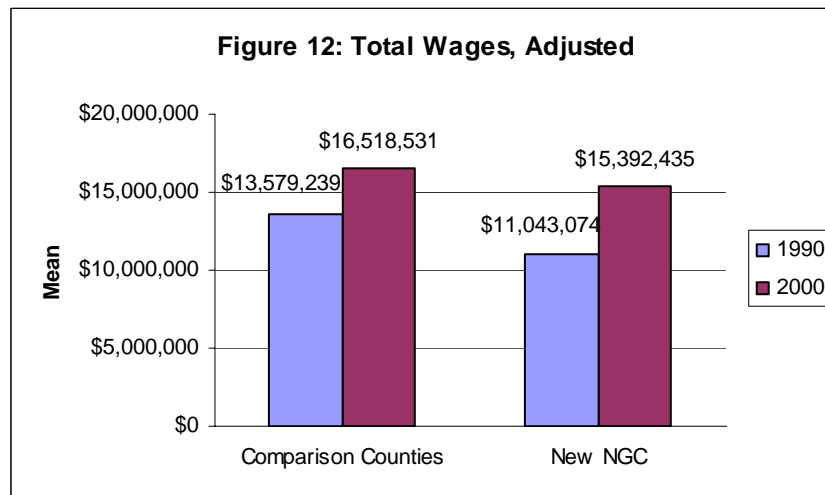


Number of Firms. The number of firms in Eddy and Foster County fell from 146 in 1990 to 138 in 2000, a decrease of 5% (Figure 11). The number of firms in the comparison counties fell from 178 in 1990 to 162 in 2000, a decrease of 9%.

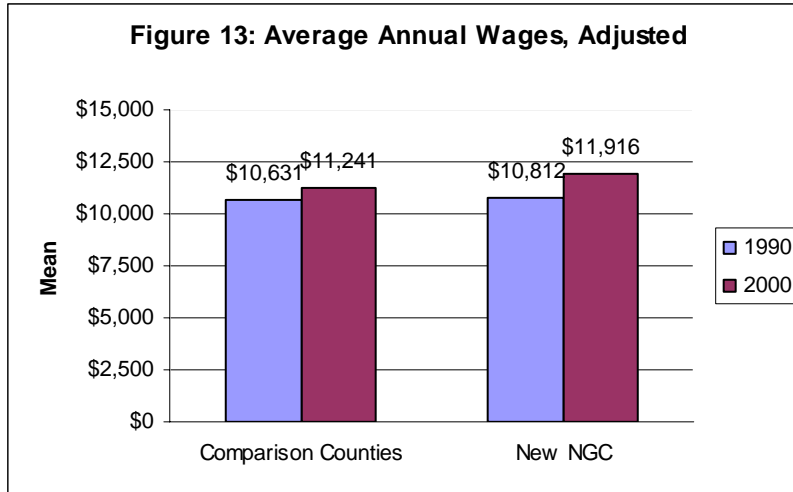


Income

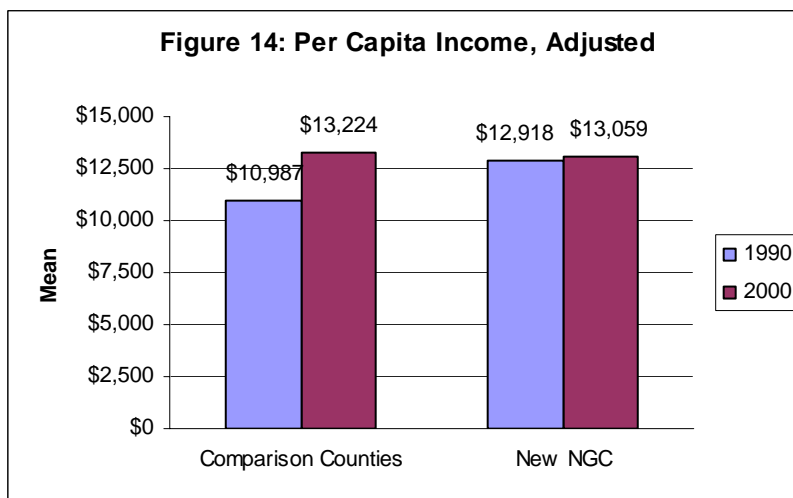
Total Wages, Average Annual Wages. Total wages, adjusted to constant collars, increased almost 40% in Eddy and Foster County and by 22% in the comparison counties (Figure 12).



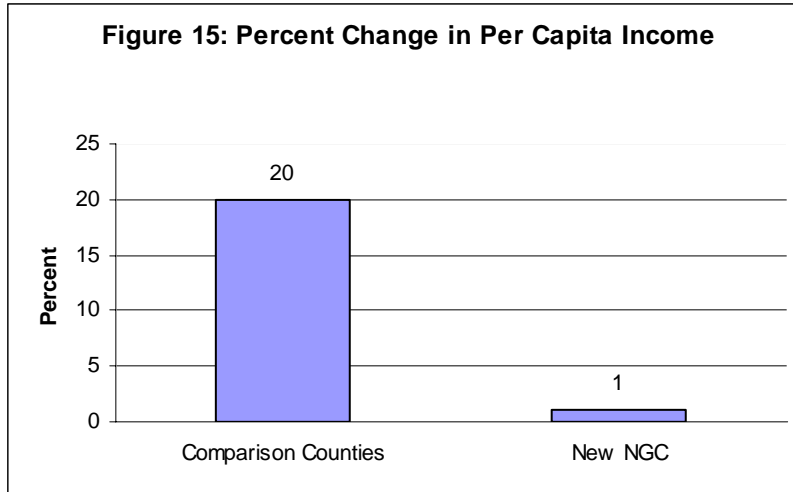
Average annual wages, in constant dollars, increased 5% in the comparison counties and increased 1022% in the counties with new generation cooperatives (Figure 13). The average annual wage in Eddy and Foster County in 2000 was \$11,916, and the average annual wage in the comparison counties in 2000 was \$11,241.



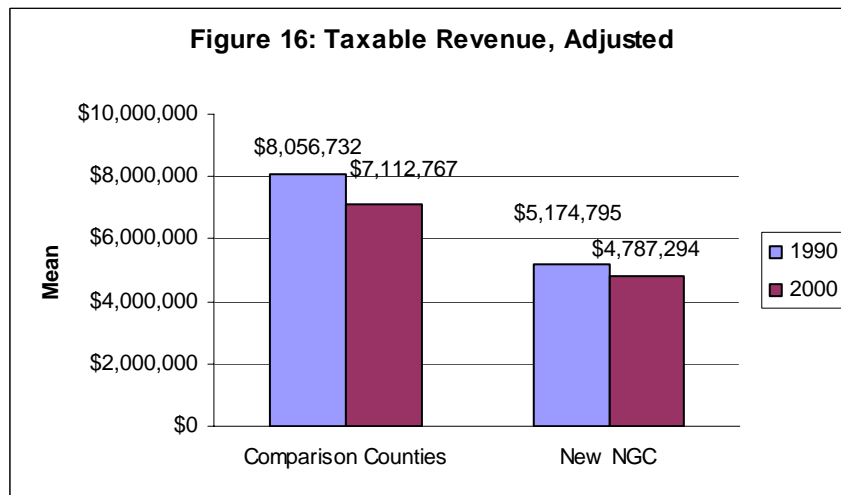
Per Capita Income. Per capita income, in constant dollars, increased by the largest percentage in the comparison counties, rising 20%, from \$10,987 in 1990 to \$13,224 in 2000 (Figure 14).



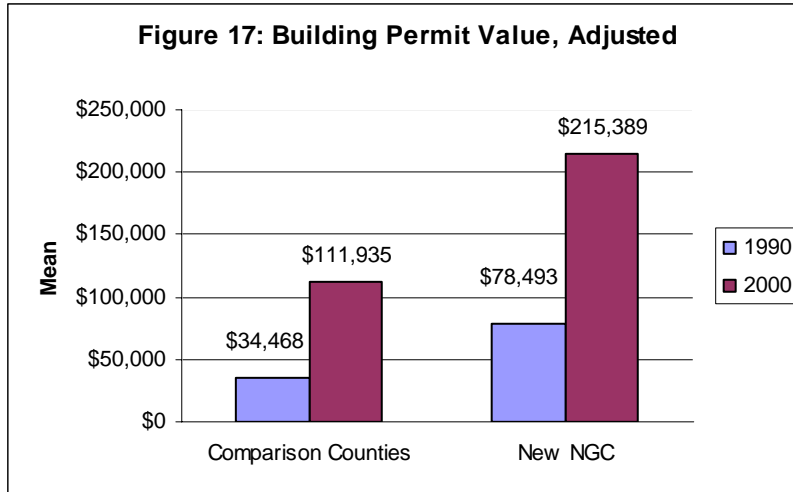
Per capita income in Eddy and Foster County increased only slightly, rising from \$12,918 to \$13,059, a 1% increase. Figure 15 details the percentage increases from 1990 to 2000 for each group of counties.



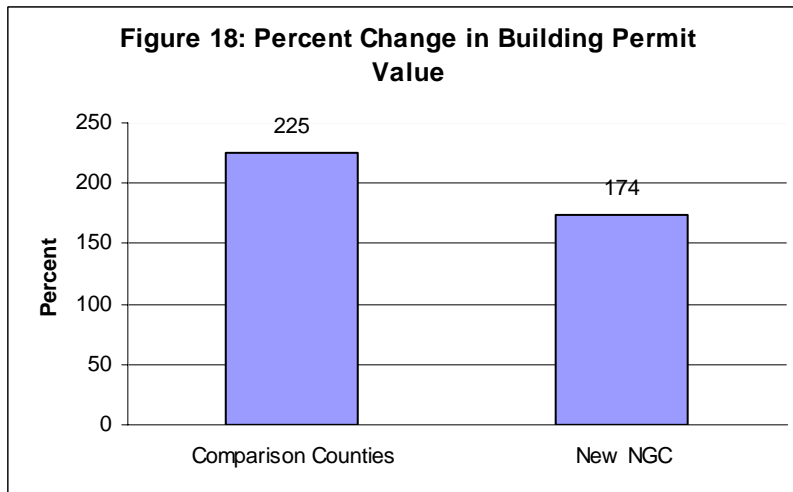
Taxable Revenue/Building Permit Values. Figure 16 compares the adjusted constant dollar value of taxable revenue for each group of counties. The comparison counties had the highest taxable revenue, both in 1990 and 2000. All counties experienced decreases in taxable revenue, with these revenues falling by 7% in counties with NGCs and 12% in the comparison counties.



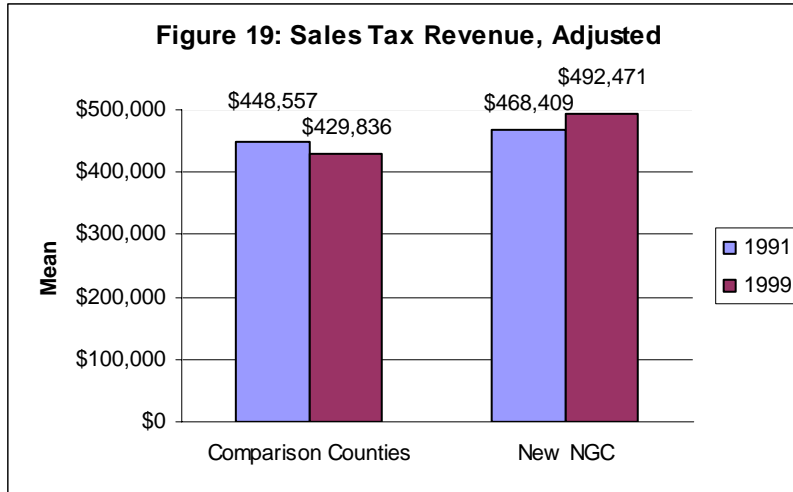
All counties experienced large increases in building permit values, adjusted to constant dollars, with the largest dollar increase in Eddy and Foster County (\$136,896), followed by the comparison counties (\$77,467).



The largest percentage increase in building permit value took place in the comparison counties (225%). Building permit value in Eddy and Foster County increased by 174% (Figure 18).

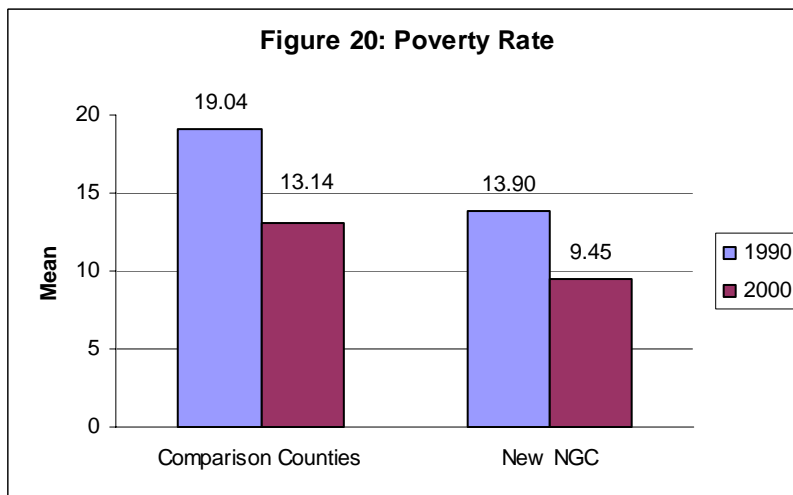


The comparison counties were the only group of counties to experience a decrease in adjusted sales tax revenue, falling 4% from \$448,557 to \$429,836 (Figure 19). Sales tax revenue in Eddy and Foster County increased by 5%, from \$468,409 to \$492,471.

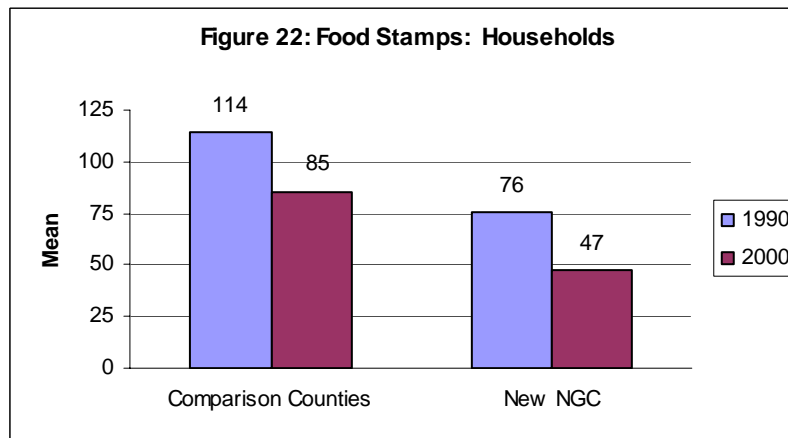
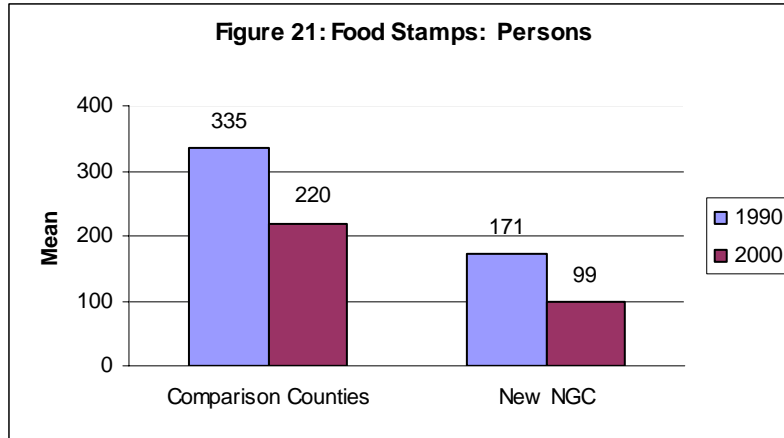


Poverty

Poverty Rate. The poverty rate in all counties decreased from 1990 to 2000, falling 32% in Eddy and Foster County and 31% in the comparison counties (Figure 20). The comparison counties have the highest poverty rate (13.14% in 2000), followed by Eddy and Foster County (9.45%).

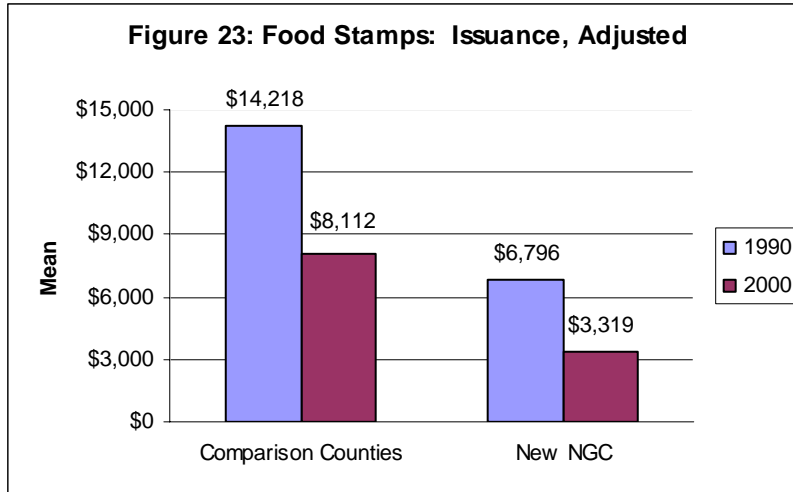


Food Stamp Participation. In addition to the poverty rate, another indicator of poverty is the number of individuals and households participating in the food stamp program and the value of the food stamps issued. From 1990 to 2000 the number of persons and households receiving food stamps decreased in all counties (Figure 21 and 22).



The largest percentage decrease occurred in Eddy and Foster County, with the number of persons decreasing by 42% and the number of households by 38%. In the comparison counties, the number of persons decreased by 34% and the number of households by 25%.

Larger decreases appeared in the adjusted value in constant dollars of the food stamps issued (Figure 23). This value fell 51% from 1990 to 2000 in Eddy and Foster County and 43% in the comparison counties. The highest value of food stamps issued in 2000 was in the comparison counties (\$8,112), compared to \$3,319 in Eddy and Foster County.

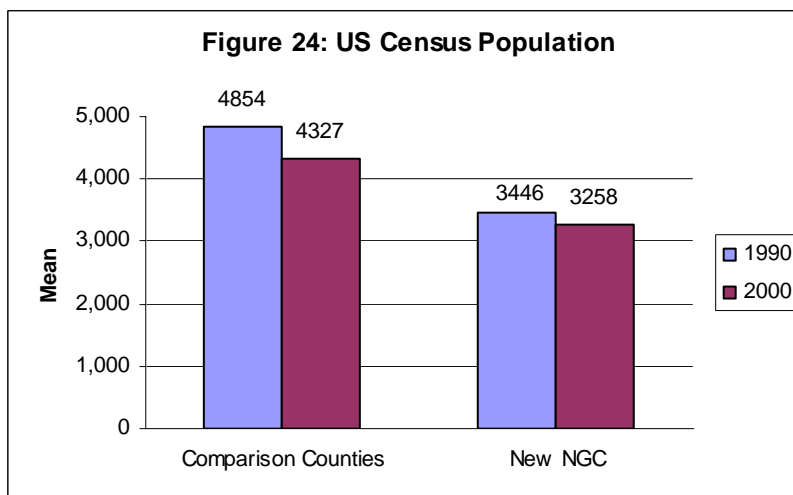


Impact on Human Capital

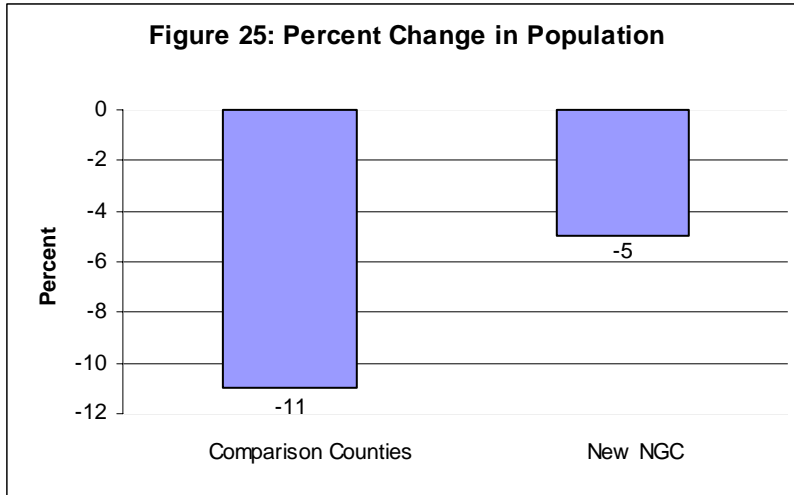
Means, net change in means and percentage change in means from 1990 to 2000 were calculated for the following measures of human capital: population, population diversity in the schools, K-12 enrollment, taxable valuation per pupil, total general fund revenue, cost per pupil and the number of high school graduates continuing their education after high school.

Population

Population. One indicator of human capital is population size. According to the US Census (Figure 24), the population of Eddy and Foster County fell by 5% from 1990 to 2000, falling from 3,446 to 3,258.



Over this same period, the population of the comparison counties decreased by 11%, from 4,854 in 1990 to 4,327 in 2000. These percentage decreases are shown in Figure 25.



Public Schools

Population Diversity. Another indicator of human capital is population diversity. One measure of diversity is the ethnic distribution in the public school. Table 1 presents the net change in the number of students enrolled by ethnic group from 1990 to 2000 for each group of counties.

Table 1. Change in Number of Students by Ethnic Group

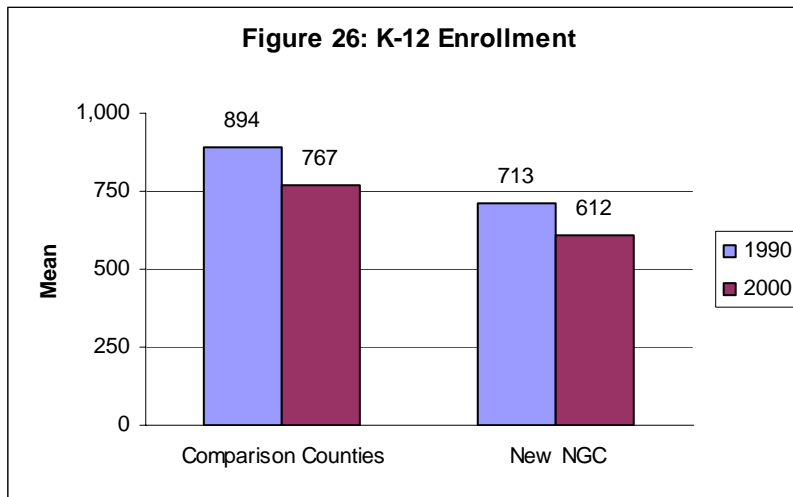
Students	Comparison Counties	New NGC	Total
Hispanic	12	7	19
Asian/Pacific Island	0	5	5
Black	1	2	3
American Indian	7	29	36
White	-150	-90	-240
Total	-130	-47	-177

Eddy and Foster County experienced a net gain in the number of Hispanic, Asian/Pacific Island, Black and American Indian students and lost fewer White students. The comparison counties gained Hispanic, Black and American Indian students while losing a larger number of White students.

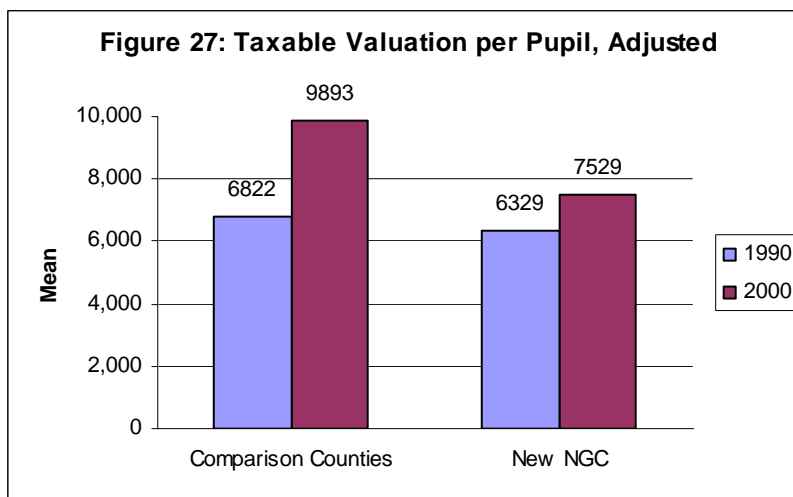
The largest increase in the number of Hispanic students was in the comparison counties (12) and the largest increase in Asian/Pacific Island students was in Eddy and Foster County (5). The largest increase in American Indian students

was in Eddy and Foster County (29). Overall, the number of students decreased by 177, with the only overall loss being in the number of White students (240).

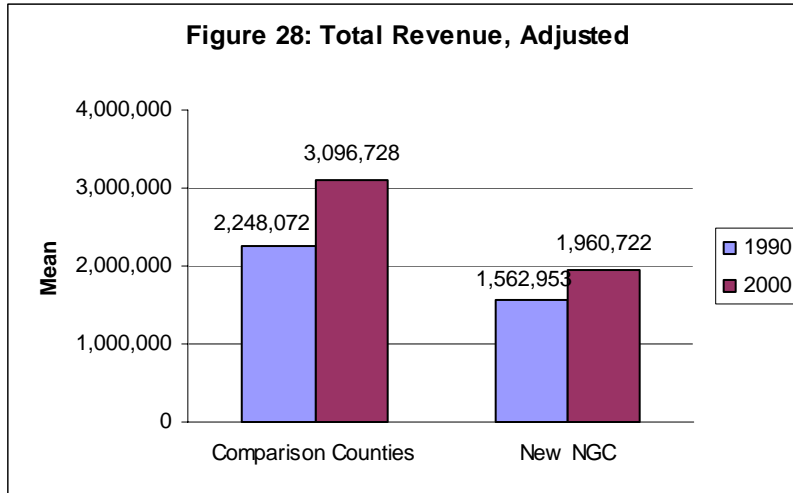
K-12 Enrollment. The number of students dropped in all counties, with the largest decrease in the comparison counties (127), followed by Eddy and Foster County (101) (Figure 26). The percentages of decrease were similar, with total enrollment decreasing 14% in the both groups of counties.



Taxable Valuation per Pupil. All counties experienced increases in taxable valuation per pupil, ranging from 45% in the comparison counties to 19% in Eddy and Foster County (Figure 27). The comparison counties have the highest taxable valuation per pupil in 2000 (\$9,893), while the average taxable valuation per pupil in Eddy and Foster County is \$7,529.



Total Revenue. Total general fund revenue is lower in Eddy and Foster County, which have the lowest average school enrollment (Figure 28).



General fund revenues increased in all counties, increasing by 25% in Eddy and Foster County, compared to 38% in the comparison counties.

Cost per Pupil. The highest costs per pupil in 2000 are found in the comparison counties (\$3,320), followed by Eddy and Foster County (\$2,381) (Figure 29).

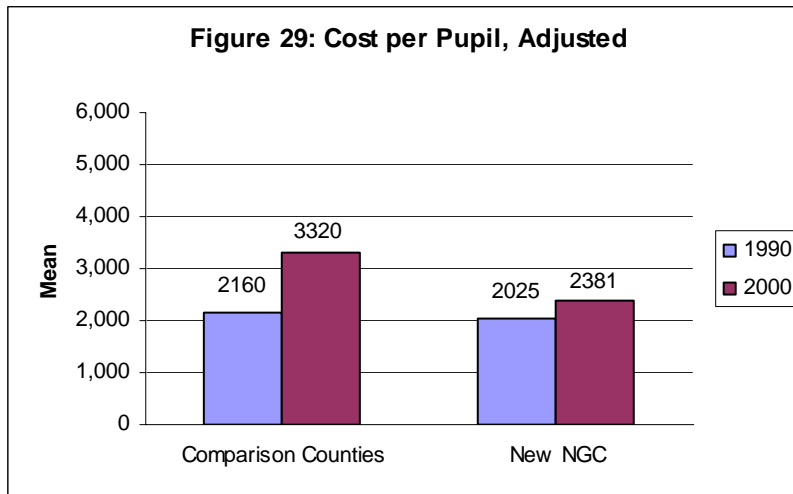
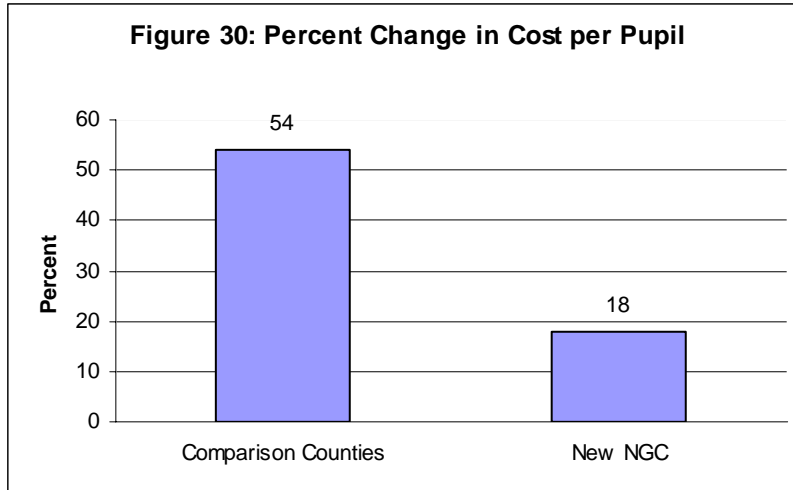
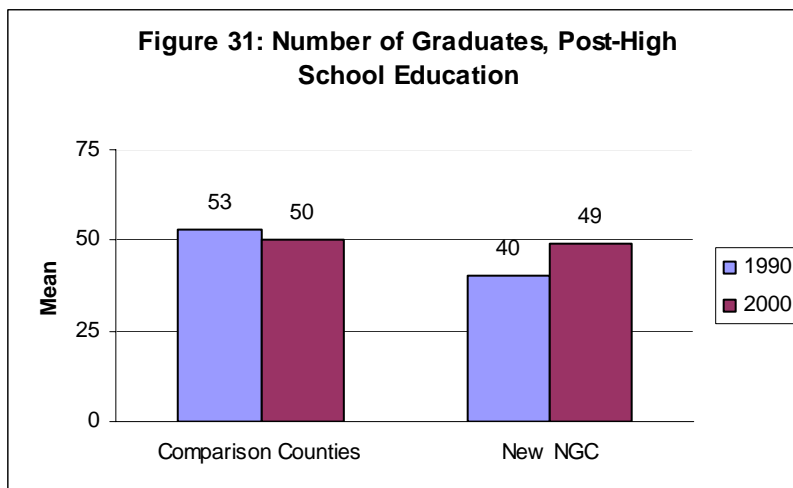


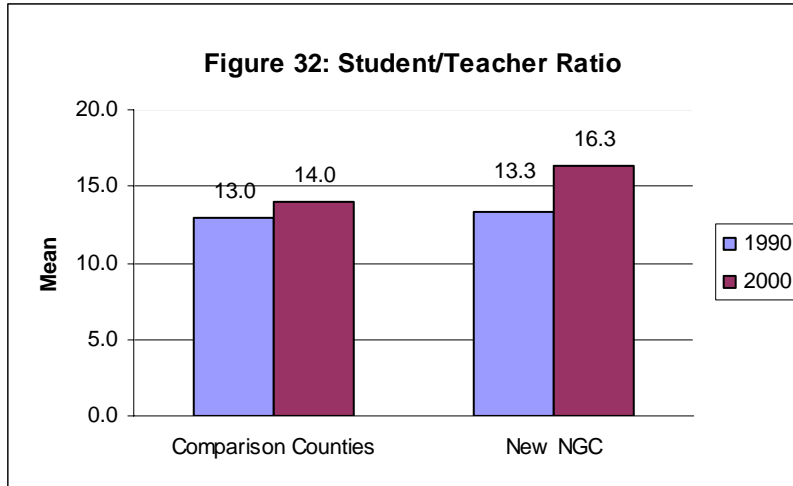
Figure 30 presents the percentage change in cost per pupil in both county groups. The largest percentage increase took place in the comparison counties (54%). The cost per pupil in Eddy and Foster County increased at a much smaller rate, increasing only 18% from 1990 to 2000.



Educational Opportunities. Another indicator of human capital is educational opportunity, measured by the number of high school graduates continuing their education at a college or university. Figure 31 presents these numbers by county group. Eddy and Foster County experienced the only increase in the number of graduates continuing their education, increasing 23% from 40 to 49. The number of students continuing their education fell by 6% (3 students) in the comparison counties.

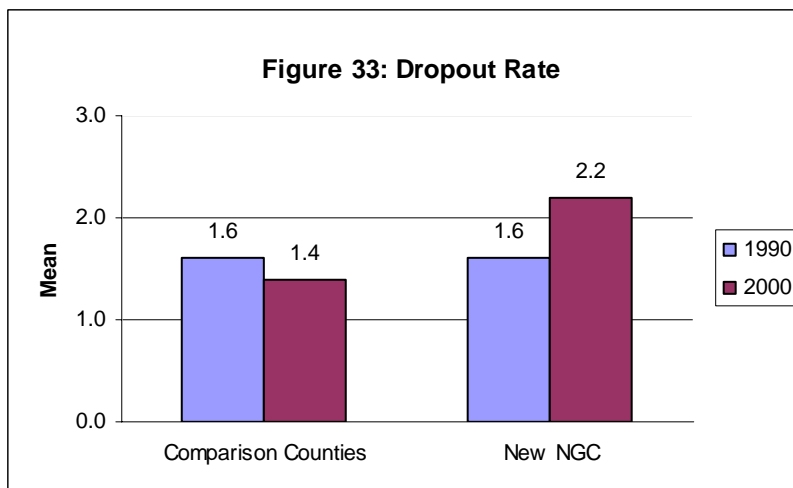


Student-Teacher Ratio. In 1990 the lowest student-teacher ratios were found in the comparison counties (13.0), followed by the counties with new generation cooperatives (13.3) (Figure 32). The comparison counties continue to have the lowest student-teacher ratios in 2000 (14.0), compared to 16.3 for Eddy and Foster County.



The largest percentage increase in student-teacher ratios took place in the counties with NGCs (Eddy and Foster County), with ratios increasing by 23% in these counties compared to 8% in the comparison counties.

Dropout Rate. The student dropout rate fell from 1990 to 2000 in the comparison counties, falling from 1.6% to 1.4% (Figure 33). Dropout rates increased in counties with NGCs, rising from 1.6% to 2.2% in Eddy and Foster County. Counties with new NGCs have the highest dropout rates.

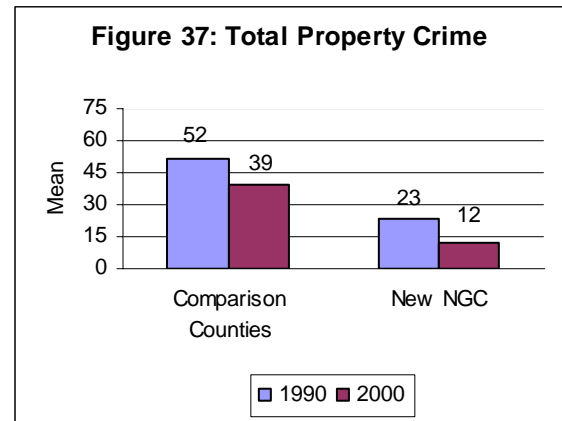
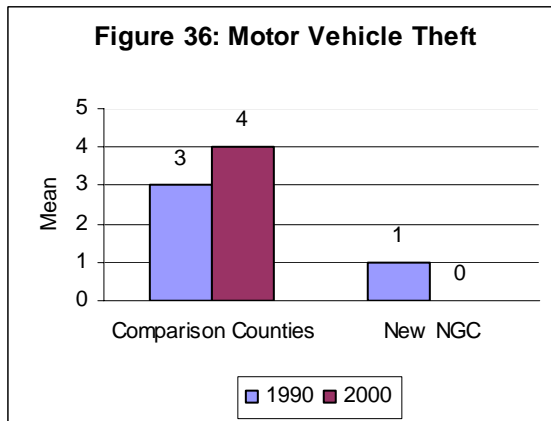
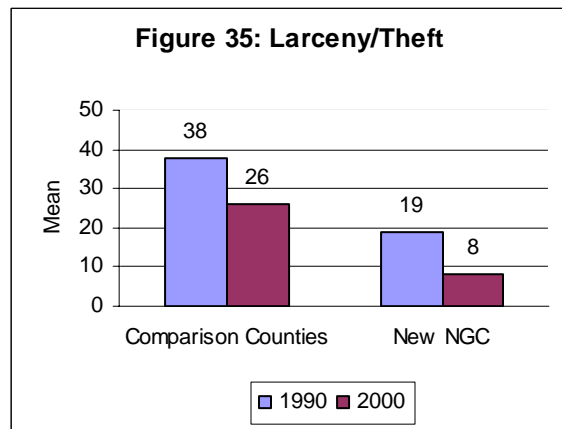
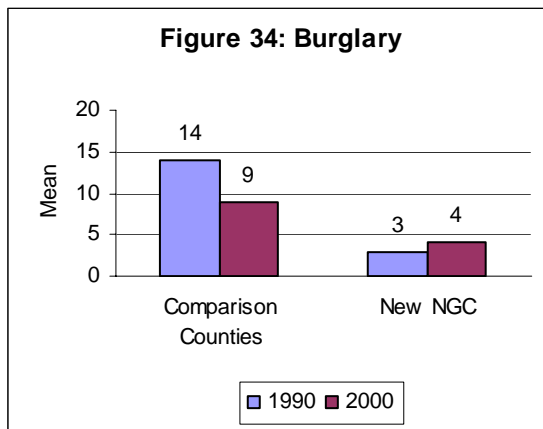


Impact on Social Capital

Means, net change in means and percentage change in means from 1990 to 2000 were calculated for the following indicators of social capital: property crime, crime and civil court cases.

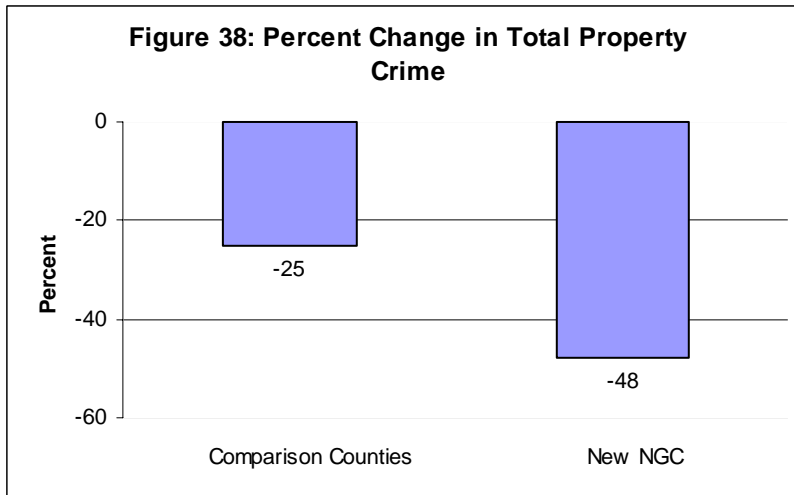
Property Crime

One indicator of social capital is the change in the number of property crimes. Figures 36, 37, 38 and 39 present the changes in the number of cases of burglary, larceny/theft, motor vehicle theft and total property crime filed for the period from 1990 to 2000.

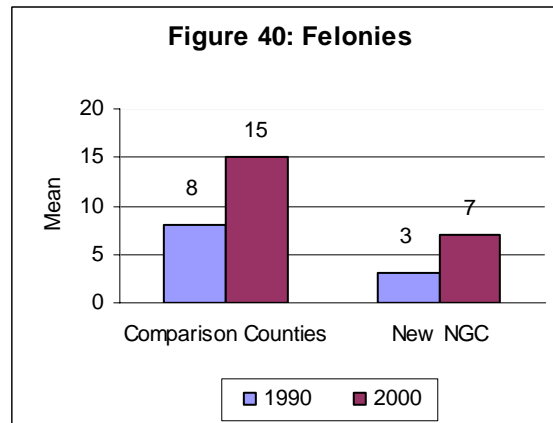
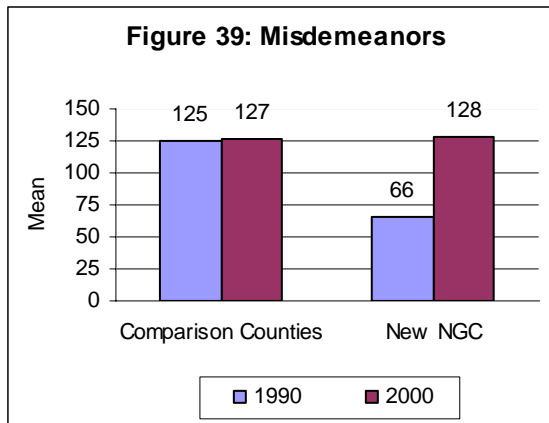


Eddy and Foster County experienced an increase in the number of cases of burglary (from 3 to 4), with decreases in the cases of larceny/theft (from 19 to 8) and motor vehicle theft (from an average of 1 to zero). In the comparison counties, cases of burglary decreased from 14 to 9, cases of larceny/theft decreased from 38 to 26 and cases of motor vehicle theft increased from 3 to 4.

Overall, total property crime decreased 48% in Eddy and Foster County, falling from 23 to 12, and decreased 25% in the comparison counties, falling from 52 to 39 (Figure 38).

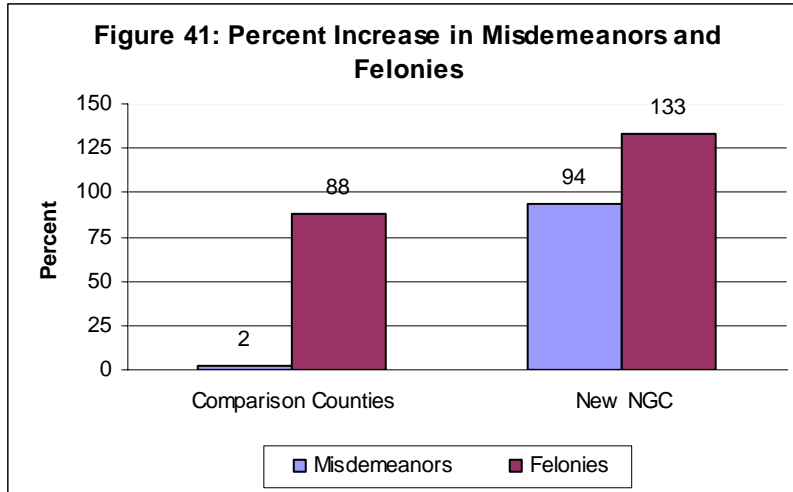


Crime. The number of cases of misdemeanors and felonies in Eddy and Foster County increased dramatically from 1990 to 2000, with misdemeanors increasing 94% from 66 to 128 and felonies increasing 133% from 3 to 7 (Figure 39 and 40).



During this same period, the comparison counties had a 2% increase in misdemeanors (from 125 to 127) and a 88% increase in the number of felonies (8 to 15).

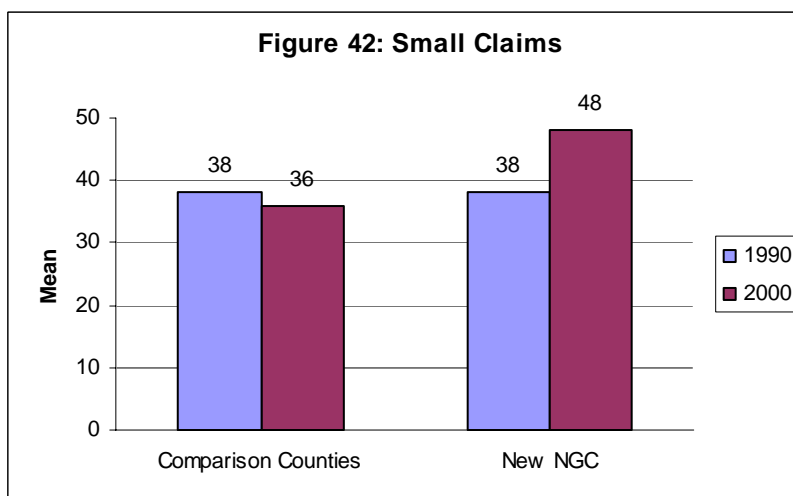
Figure 41 presents the percentage change in the number of misdemeanors and felonies for each group of counties.



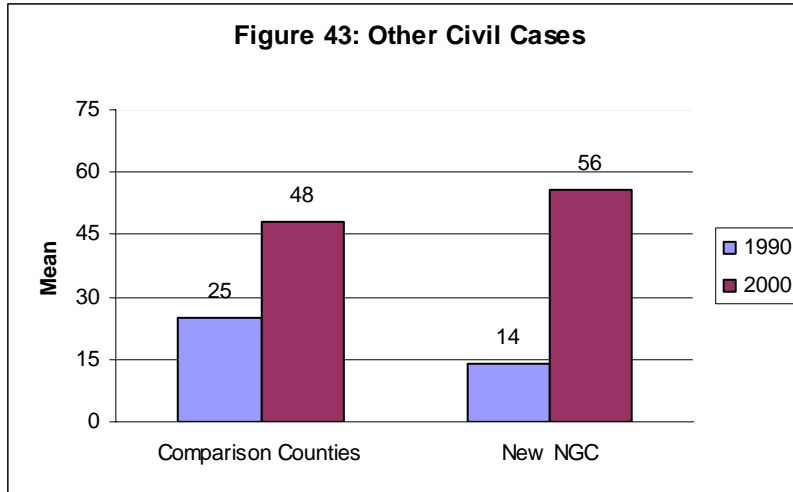
Civil Court Cases

Civil court cases involve disagreements among citizens regarding such issues as property conflicts and personal injury and is one indicator of the cohesiveness of the community and the ability of citizens to work together to solve disagreements.

Small Claims. Figure 42 presents the change in the number of small claims from 1990 to 2000. The number of small claims in Eddy and Foster County increased from 38 to 48, a 26% increase. Over this same time period, the number of small claims filed in the comparison counties decreased 5%, from 38 to 36.

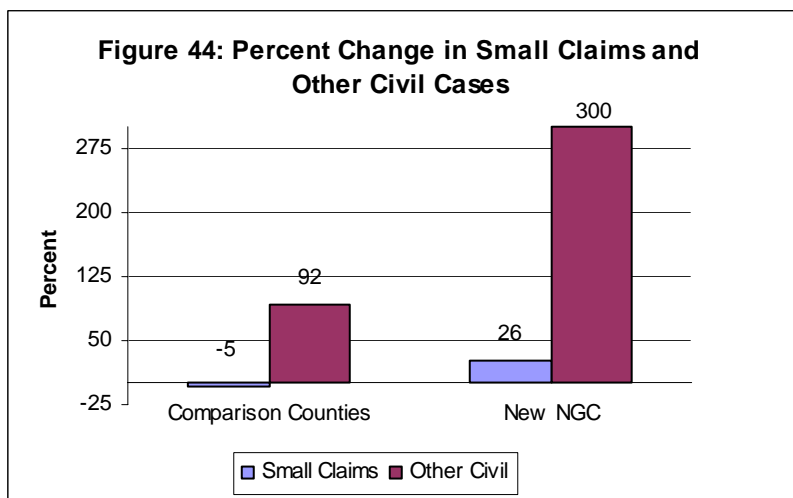


Other Civil Cases. The change in the number of other civil cases filed in each group of counties from 1990 to 2000 is shown in Figure 43.



The number of other civil cases filed in all counties increased from 1990 to 2000, with increases ranging from 92% to 300%. The largest percentage increase was in the counties with more recently established new generation cooperatives, Eddy and Foster County. The number of civil cases in these counties increased 300%, rising from 14 in 1990 to 56 in 2000. The number of other civil cases filed in the comparison counties increased 92%, from 25 to 48.

The percentage changes from 1990 to 2000 for small claims and other civil cases for each group of counties are summarized in Figure 44.



For the counties with new generation cooperatives, the number of small claims filed increased by 26%, compared to a decrease of 5% for the comparison counties, and the number of other civil cases filed increased by 300%, compared to an increase of 92% in the comparison counties.

CONCLUSIONS

Impact on Financial Capital

Employment: The counties with the NGCs – Eddy and Foster County – experienced the largest percentage increase in average annual employment and the smallest decrease in the labor force. These two counties also experienced the only increase in the number of persons employed and the percentage of persons unemployed decreased at a higher rate than the number unemployed in the comparison counties. The 2000 unemployment rate is higher in Eddy and Foster County, but these counties still had the largest percent decrease in the unemployment rate. The lowest unemployment rate both in 1990 and 2000 was in the comparison counties, which decreased only slightly from 1990 to 2000. The number of firms dropped 5% in Eddy and Foster County and decreased 9% in the comparison counties.

Income, Wages, Taxable Revenue, Sales Tax Revenue: The average annual wage in the counties with new generation cooperatives increased at a rate double that of the comparison counties; however, the per capita income in the comparison counties increased 20% from 1990 to 2000 compared to 1% in Eddy and Foster County. The comparison counties had a larger percentage decrease in taxable revenue than did counties with NGCs, but still recorded a higher total taxable revenue value in 2000 than did Eddy and Foster County. Building permit values in all counties increased dramatically, with increases of 225% in the comparison counties and 174% in Eddy and Foster County. Sales tax revenue fell in the comparison counties while increasing by 5% in Eddy and Foster County.

Poverty: Poverty rates decreased 32% in Eddy and Foster County and 31% in the comparison counties. The comparison counties, however, still have the highest poverty rate, 3.69 points higher than the counties with NGCs. All counties experienced decreases in the number of persons and households participating in the food stamp program. The largest percentage decreases in the number of persons and households occurred in Eddy and Foster County, which also had the largest percentage decrease in the value of the food stamps issued. The comparison counties experienced lower, but still significant, decreases.

Impact on Human Capital

Population: The comparison counties recorded a larger decrease in population, both in absolute number and in percentage of change, than did counties with new generation cooperatives, with the population in those counties decreasing by 11% compared to 5% in the NGC counties.

Public Schools: The counties with NGCs – Eddy and Foster County – experienced a smaller net decrease in public school enrollment, with the largest increase in the number of American Indian and Asian/Pacific Island students. These two counties also had the only increase in the number of high schools students continuing their education after high school. K through 12 school enrollments decreased 14% in all counties. Taxable valuation per pupil increased 45% in the comparison counties compared to 19% in Eddy and Foster County. Total general fund revenues were highest in counties with larger enrollments, and revenues increased by 25% in Eddy and Foster County and by 38% in the comparison counties. Cost per pupil increased substantially in the comparison counties (54%) compared to Eddy and Foster County, where the cost per pupil increased only 18%. Student-teacher ratios increased at a higher rate in counties with NGCs, rising by 23%. The comparison counties have the lowest ratios at 14.0. Dropout rates are lowest in the comparison counties (1.04) and they are the only group of counties to experience a decrease in the dropout rate. The rate in these counties decreased 13%, compared to a 38% increase in Eddy and Foster County.

Impact on Social Capital

Property Crime: The changes in the incidence of property crime are mixed, with the number of burglaries decreasing by almost 40% in the comparison counties and increasing by a third in Eddy and Foster County. The number of larceny/thefts decreased 58% in Eddy and Foster County and 32% in the comparison counties. Motor vehicle thefts increased by a third in the comparison counties while dropping to zero in Eddy and Foster County (which had very small numbers of motor vehicle thefts in 1990). Total property crime fell 48% in Eddy and Foster County and 25% in the comparison counties.

Crime: Eddy and Foster County experienced a 94% increase in misdemeanors, while the other counties experienced an increase of 2%. Felonies, also, increased substantially in Eddy and Foster County, rising by 133% compared to 88% in the comparison counties.

Civil Court Cases: The number of small claims filed decreased only in the comparison counties, while increasing 26% in Eddy and Foster County. Eddy and Foster County also had the largest numbers of small claims and other civil cases filed in 2000. The number of other civil cases filed in all counties increased from 1990 to 2000. The number of cases filed increased 300% in Eddy and Foster County and 92% in the comparison counties.

SECTION II: ANALYSIS OF MEAN DIFFERENCES

METHODOLOGY

A difference of means test was used which looks at both the absolute difference in the mean value of the rate of change from 1990 to 2000 between the counties with new generation coops and the other farming dependent counties. If the difference in the means, using a confidence interval of .10, was found to be significant, then one could conclude that the presence of the new generation cooperative may account for the difference. Lack of significance may be the consequence of two factors: The absolute difference was too small to be due to more than chance variation; or the degree of variation in the means of the other farming-dependent counties was so great that one or more of them could have the same degree of change as the counties with new generation cooperatives. A comparison of means and tests of significance are provided in Tables 2, 3 and 4. Where ever missing data in The comparison of means used data with missing values replaced by their predicted values.

This analysis compares means for counties with the most recent new generation cooperatives and for the remaining farming dependent counties in North Dakota. The comparison includes comparisons of the two counties with the most recently established new generation cooperatives (Eddy County and Foster County) to the remaining farming dependent counties with the exception of Pembina County and Traill County. These counties were excluded because of the presence of facilities of earlier new generation cooperatives which might have confounded the analysis. A conclusion summarizes the major differences found over time for this comparison.

ANALYSIS

Impact on Financial and Built Capital

Percent changes (1990-2000) were calculated for all the counties' agriculture dependent counties and the New Generation Cooperative counties for the following indicators of financial capital: number of firms, average employment, adjusted total wages, adjusted average wages, labor force, employed and unemployed, unemployment rate, adjusted income, adjusted taxable income, adjusted sales tax revenue, BEA income, adjusted taxable revenue, adjusted sales tax revenue, households and person on Food Stamps, and adjusted issuance of Food Stamps. Of these sixteen comparisons of financial capital, only the comparison of means of adjusted building permit values was significantly different between New Generation Cooperative counties and the other agriculture dependent counties.

Table 2. Mean Differences in Financial & Built Capital

Variables	Agric. Dep. Cos.	New Gen. Coop. Cos.	Sig.
Number of firms	-10.53	-5.60	.366
Average employment	12.14	17.21	.714
Adj. total wages	18.82	31.16	.489
Adj. average wages	5.53	10.42	.338
Labor force	-10.17	-3.02	.306
Employed	-16.24	-2.06	.581
Unemployed	-2.55	-22.06	.446
Unemployment rate	9.61	-20.32	.339
BEA adj. income	23.78	.96	.267
Adj. taxable revenue	-10.93	-9.60	.846
Adj. sales tax rev.	-7.01	-5.80	.953
Adj. bldg. permit value (replaced)	100.74	595.34	.011
Poverty rate (replaced0	-29.21	-26.03	.754
Household/Food Stamps	-27.00	-37.68	.501
Persons/Food Stamps	-38.16	-41.51	.834
Adj. issuance/Food Stamps	-48.30	-51.07	.858

Foster and Eddy counties had an almost six-fold increase (595.34%) in the adjusted building permit value compared to 101 percent in the remaining agriculture dependent counties. No doubt the five fold increase in building permit values in this time period is explained by the new construction associated with the Dakota Growers Pasta Company in Foster Co. and the North American Bison Cooperative in Eddy Co.

Impact on Human Capital

Percent changes (1990-2000) were calculated for all the counties agriculture dependent counties and the New Generation Cooperative counties for the following indicators of human capital: Student-teacher ratio, drop-out rate, number of high school graduates, K-12 enrollment, adjustable taxable revenue per pupil, adjusted total school revenue, adjusted cost per pupil, census population, BEA population, minority students except Native American, and minority students including Native American. Of the eleven comparisons, only the comparisons of percent change in adjusted cost per pupil and minority students excluding Native American students were significantly different between the agricultural dependent counties and the New Generation Cooperative counties.

Table 3. Mean Differences in Human Capital

Variable	Agric. Dep. Cos.	New Gen. Coop. Cos.	Sig.
Student-teacher ratio	7.35	21.04	.240
Dropout rate (replaced)	42.54	67.76	.926
Number of graduates	-3.17	22.79	.304
K-12 enrollment	-15.99	-13.73	.774
Adj. taxable revenue per pupil	48.02	19.60	.120
Adj. total school revenue	38.46	29.21	.450
Adj. cost per pupil (replaced)	53.38	17.65	.007
Census population	-12.23	-5.51	.183
BEA population	-12.62	-5.99	.203
Minority students except Nat. Am.	125.06	700.00	.000
Minority students including Nat. Am.	113.98	196.47	.409

For Eddy and Foster Cos. the adjusted cost per pupil increased by only 17.65% over the decade, whereas in the other agriculture dependent counties it increased by 53.38%. This may be explained by the fact that the school population, adjusted taxable valuation, and adjusted total revenue were lower on the average in Foster and Eddy counties than in the other agriculture dependent counties.

The only other significantly different comparison of means for Eddy and Foster Cos. and the rest of the agriculture dependent counties was that of minority students excluding Native Americans. Foster and Eddy counties experienced a 700 percent increase in the minority student population, whereas the remaining agriculture dependent counties experienced a 125 percent increase. The increase in minority students in these counties can be attributed to the immigration of minority employees to the two production facilities, but the increase should be considered in context of increases in small numbers. The mean number of minority students in Eddy and Foster Cos. increased from two to sixteen over the ten year period.

Impact on Social Capital

Means, net change in means and percentage change in means from 1990 to 2000 were calculated for the following indicators of social capital: Burglary, larceny, motor vehicle theft, total property crime, misdemeanors, felonies, small claims cases, and other civil court cases. Of the eight comparisons, only the comparisons of means of burglary and other civil court cases were significantly different between the new generation cooperative counties and the other agriculture dependent counties.

Table 4: Mean Differences in Social Capital

Variables	Agric. Dep. Cos.	New Gen. Coop. Cos.	Sig.
Burglary (replaced)	8.01	256.79	.001
Larceny (replaced)	99.32	9.12	.801
Motor vehicle theft (replaced)	81.36	100.06	.921
Total property crime (replaced)	142.25	33.92	.817
Misdemeanor (replaced)	42.26	162.15	.147
Felony (replaced)	181.65	183.33	.995
Small claims (replaced)	58.89	29.16	.793
Other civil court cases	123.25	289.77	.044

Burglaries increased by 256 percent in Eddy and Foster Counties whereas they increased by only eight percent in the other agriculture dependent counties. Other civil court cases increased by 289 percent in Eddy and Foster Cos., but they increased by 123 percent in the other agriculture dependent counties. These two significant comparisons indicate that the presence of the new generation cooperative facilities have strained the social capital in Foster and Eddy counties. However, the large percent increases in these two measures have to be understood in context of increases in small numbers: The average number of burglaries increased from three to nine in Foster and Eddy Cos., whereas the average number of civil court cases files increased from 27 to 112.

SUMMARY AND CONCLUSIONS

Summary

Only five of the thirty five (14%) comparisons revealed that mean percentage change in indicators of financial/built, human and social capital in the counties with later new generation cooperatives were significantly different from the remaining farming dependent counties. Of these comparison none of the means for financial capital, the mean for the one measure of built capital, two of the means for measures of human capital, and two of the means for measures of social capital were significantly different between the two counties with later new generation cooperatives and the remaining agriculture dependent counties.

For Foster and Eddy counties, only one of the built capital measures (adjusted value of building permits), two human capital measures (adjusted cost per pupil, minority students except Native American), and two of the social capital measures (burglary and other civil court cases) were significantly different from the other farming dependent counties.

For measures of built capital, the difference in means was as expected with the construction of the new generation cooperative facilities itself as well as other new construction in Carrington and New Rockford, especially new home construction, explaining the increase.

Of the measures of changes in human capital, only the comparisons of adjusted cost per pupil and minority students except Native American were significant. Foster and Eddy counties had lower adjusted costs per pupil but more minority student enrollment. The former is anomalous as it was expected that with new construction, taxable valuation would increase as would school spending. Throughout the decade, however, the average taxable revenue and total school revenue in Eddy and Foster counties remained lower than that of the comparison counties. Only for minority student enrollment did the significant difference in rates of increase confirm our expectations that with increased employment opportunities in these two counties, minority populations would increase also.

Of the measures of changes in social capital, only the difference in means for burglary and other civil court cases were significant. Both Eddy and Foster counties had higher rates of increase in burglary and other civil court case filings indicating that the presence of the new generation cooperative strained the social capital in the communities. As the industrial development literature indicates, this is not unexpected.

Conclusions

Based upon the industrial structure hypothesis, the literature on economic development and community change, and a review of the impacts of new generation cooperatives, it was hypothesized that new generation cooperatives would have mixed impacts on community capitals. Overall, for Foster and Eddy counties, only 14 percent (5 of 38) of the comparisons indicated that the presence of the new generation cooperatives may have contributed to the mean differences between these counties and the rest of the farming dependent counties. Thus, the presence of prior or contemporary new generation cooperatives had limited effects on measures of community capital. The contemporary new generation cooperatives did appear to have a limited effect on human capital by improving the population diversity and attenuating the rise in adjusted cost per pupil, and they had a limited effect on built capital through adjusted value of building permits as a result of new construction. The presence of new generation cooperatives had no effect on measures of financial capital. In regard to social capital, they affected only burglary rates and other civil court cases.

The results indicate mixed support for the thesis from cooperative community development that value-added, new generation cooperatives would have positive impacts on their communities. Over time within counties with new generation cooperatives, the impacts are readily apparent, but whether those impacts can be attributed solely to the presence of the cooperative was only minimally supported. The difference of means tests indicated that the changes in only 14 percent of the measures of community capital could be attributed to the presence of new generation cooperatives.

The shortcomings of this research are several. First, the impacts of new generation cooperatives are experienced at several levels: The individual, community and the region. Using the county as the unit of analysis may confound the interpretation of results. It is at the community level where the greatest impacts in some community measures of financial and human capital may be experienced. However, the trade region or commuting zone may be the better unit of analysis to determine the impact of individual measures of financial and human capital. In addition, the measures of social capital may be experienced more at the community level than at the county or regional level.

Secondly, using a quasi-experimental design that compares changes over time of the study group (counties with new generation cooperatives) with a control group (all other farming dependent counties) only indirectly measures the changes within the county. Ideally, a longitudinal design that utilizes before and after measures of community capital measured at the community level would better capture these changes. Although our measures begin in 1990 before the establishment of the contemporary new generation cooperatives, the impacts are measured at the county rather than the community level.

These shortcomings aside, the results of the quasi-experimental design indicate that the observed impacts in community capitals in the counties with new generation cooperatives cannot be attributed to the presence of new generation cooperatives alone. They also indicate that the assumed benefits that are extracted from anecdotal data and case studies may be attributed to other factors than to the presence of new generation cooperatives.

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Appendix A: Data and Data Sources

Number of firms, average employment, total wages, average wages, labor force, employed, unemployed, unemployment rate, per capita income, taxable revenue, sales tax revenue, building permit value, Food stamp participation, number of households, number of persons, issuance

North Dakota Data Warehouse, Job Service of North Dakota
<http://www.state.nd.us/jsnd/warehouse.htm>

Poverty rate

US Department of Agriculture

<http://www.ers.usda.gov/Data/PovertyRates/PovListpct.asp?ST=ND&views=>

Percent

Number of graduates, post high school education, number of students by ethnic background, K-12 enrollment, taxable valuation by pupil, total revenue, cost per pupil, student-teacher ratio, dropout rates

Department of Public Instruction

Burglary, larceny/theft, motor vehicle theft total property crime

Uniform Crime Reports, Office of the Attorney General

Bureau of Criminal Investigation, Information Service Manager

Misdemeanors, felonies, small claims, other civil cases

North Dakota Judicial System Annual Reports

Office of the Attorney General

Population

US Census Bureau