

# **ECONOMIC IMPACT OF NORTH CAROLINA'S ELECTRIC COOPERATIVES**



**A Report Prepared for**

**The North Carolina Association of Electric Cooperatives**

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## Executive Summary

In North Carolina today, there are 27 electric distribution cooperatives that provide electric service to approximately 910,748 households and businesses. This study undertaken for the North Carolina Association of Electric Cooperatives explores the economic impact of North Carolina's 27 electric distribution cooperatives on the economy of the state.

North Carolina's electric cooperatives affect the North Carolina economy in four main ways: 1) operational expenditures of the cooperatives (including wages) increase the demand for the products of other industries and the earnings of worker households, 2) investment spending for new capital equipment raises the demand for products produced in various capital goods industries, 3) capital credits paid to customer households and businesses stimulate the spending of co-op members, and 4) grants and loans for economic development projects raise the spending of various community groups and institutions.

The direct effects of co-op operations in 2005 and 2006 are as follows:

	<u>2005</u>	<u>2006</u>
Operating Expenditures	\$1,203,895,671	\$1,284,905,364
Investment Expenditures	\$275,378,565	\$366,699,005
Capital Credits	\$43,993,474	\$26,072,962
<u>Econ. Dev. Funding</u>	<u>\$3,154,831</u>	<u>\$6,888,612</u>
Total	\$1,526,422,541	\$1,684,565,943

These expenditures, which stem *directly* from co-op operations, affect the North Carolina economy through multiplier effects on state output, income, and employment. Each dollar spent generates additional dollars of output and income through successive rounds of re-spending within the state economy. The effects of this re-spending are termed multiplier effects.

In 2005, because of the direct, indirect, and induced effects of co-op operations, total output was higher by \$2.03 billion. Value added (or state gross domestic product) was larger by \$1.36 billion. Personal income was higher by \$1.08 billion, and labor income larger by \$329 million. A total of 8,994 jobs were created at an average wage of \$36,535.

As a result of funds expended directly by the cooperatives in 2006, the total output of goods and services by all industries in the state was higher by \$2.24 billion. The state's value added was larger by \$1.50 billion. Personal income was higher by \$1.16 billion, and labor income was greater by \$362 million. Total employment in the state was higher by 9,511 jobs, and the average wage of the new jobs created was \$38,112, or 1.8 percent above the state average.

Cooperatives are exempt from corporate income tax at the state and federal levels because of their non-profit status. However, they are subject to sales, property, and other taxes. In addition, the multiplier effects that arise from co-op operations generate state and local tax revenue along with increased income and employment. In total, co-op operations fostered \$224.5 million in additional state and local tax revenues. Of this, \$90.0 million was from sales taxes, \$78.4 million from property taxes, \$19.5 million from income taxes, and \$36.6 million from other state and local taxes. State and local taxes represented 10.0 percent of the total output (business receipts) generated by electric cooperatives in 2006.

## Introduction

Electric cooperatives are private, independent electric utilities, owned by the members they serve. Electric cooperatives began with the establishment of the Rural Electrification Administration (REA) in 1935. The state's first electric cooperative was Edgecombe-Martin EMC established in 1936.

Today, in North Carolina, there are 27 electric distribution cooperatives that provide electric service to approximately 910,748 household and business customers (Table 1).

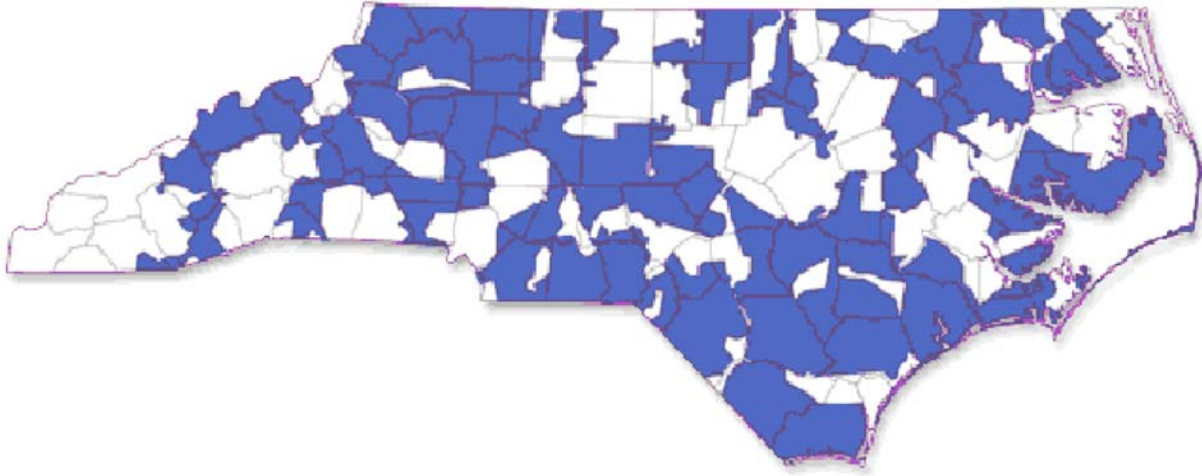
**Table 1: North Carolina's Electric Distribution Cooperatives**

	<b>North Carolina Electric Cooperative:</b>	<b>Number of Meters</b>	<b>Number of Employees</b>	<b>Miles of Line</b>
1	Albemarle Electric Membership Corporation	11,665	35	1,272
2	Blue Ridge Electric Membership Corporation	69,407	175	7,578
3	Brunswick Electric Membership Corporation	71,335	147	5,884
4	Cape Hatteras Electric Cooperative	7,123	26	327
5	Carteret-Craven Electric Cooperative	36,000	84	2,086
6	Central Electric Membership Corporation	18,376	62	2,025
7	Edgecombe-Martin Cnty. Elec. Membership Corp.	11,596	47	1,712
8	Energy United	113,906	177	11,598
9	Four County Electric Membership Corporation	31,120	100	4,836
10	French Broad Electric Membership Corpotation	35,570	118	4,268
11	Halifax Electric Membership Corporation	11,458	47	1,649
12	Harkers Island Electric Cooperative	1,316	8	59
13	Haywood Electric Membership Corporation	24,443	66	2,721
14	Jones Onslow Electric Membership Corporation	54,389	157	2,053
15	Lumbee River Electric Membership Corp.	47,092	113	5,006
16	Pee Dee Electric Membership Corporation	20,239	75	3,200
17	Piedmont Electric Membership Corp.	30,498	112	2,221
18	Pitt & Greene Electric Membership Corporation	8,582	28	1,042
19	Randolph Electric Membership Corporation	31,106	87	4,031
20	Roanoke Electric Cooperative	14,776	77	2,163
21	Rutherford Electric Membership Corporation	63,650	187	7,335
22	South River Electric Membership Corporation	38,972	112	5,144
23	Surry-Yadkin Electric Membership Corporation	26,335	55	1,198
24	Tideland Electric Membership Corporation	21,714	80	2,385
25	Tri-County Electric Membership Corporation	22,340	48	2,517
26	Union Power Cooperative	58,240	115	5,665
27	Wake Electric Membership Corporation	29,500	82	2,600
	<b>Total</b>	<b>910,748</b>	<b>2,420</b>	<b>92,575</b>

Source: NC Association of Electric Cooperatives, Directory of North Carolina's Electric Cooperatives (Raleigh, NC: NC Association of Electric Cooperatives, 2005-2006).

North Carolina's electric co-ops provide services in 93 of the state's 100 counties (Figure 1). Their service area extends to well over half of the area of the state, with some 92,575 miles of transmission lines.

**Figure 1: North Carolina Electric Co-ops Service Area**



This study undertaken for the North Carolina Association of Electric Cooperatives explores the economic impact of North Carolina's 27 electric distribution cooperatives on the economy of the state. The first section examines the operations of the cooperatives. The second section defines the measures used to assess economic impact and sets out the methodology used to estimate the impact. The final section presents the economic impact measures.

## Operations of North Carolina Electric Cooperatives

The staff of the North Carolina Association of Electric Cooperatives surveyed the 27 member cooperatives in the fall of 2007, requesting operating information from each of the cooperatives. Table 2 summarizes the results of the survey.

In 2006, total revenues of the 27 cooperatives totaled \$1.59 billion. Revenues include all customer charges for electric service as well as earnings from other non-electric enterprises. They have grown at a compound average annual rate of 7.4 percent since 2002.

Total expenses in 2006 were \$1.55 billion, rising at a 8.0 percent annual rate since 2002. The cooperatives paid \$87.8 million in wages, employing 2,383 persons full time. The average wage of those employed full-time was \$36,831, which was slightly below the state average of \$37,440.

Other operating expenses were \$1.20 billion, which included the purchase of electric power from power producers both in and out of the state.<sup>1</sup> Most of the cooperatives purchase their power from the North Carolina Electric Membership Corporation (NCEMC). NCEMC acquires the power it sells to the distribution cooperatives in a number of ways, including 1) ownership of a 56.25% share of the Catawba Nuclear Station #1 in York County, South Carolina, 2) peaking generators in Anson and Richmond counties and on the Outer Banks (Buxton and Ocracoke), and 3) purchases from investor-owned utilities.

Total taxes paid by the cooperatives in 2006 amounted to \$57.6 million, or 3.7 percent of their total expenses. Although cooperatives are exempt from corporate income tax at the state and federal levels because of their non-profit status, they are subject to sales, property, and other taxes.

Margin, or the difference between revenues and expenses, for the 27 cooperatives amounted to \$42.0 million, or 2.6 percent of total revenues, in 2006. These funds are either reinvested back into the cooperatives or paid out to the members (the customers) in the form of capital credits. In 2006, capital credits amounted to \$26.1 million, or 1.6 percent of total revenues. Capital credits lower the net cost of power to the customers of the cooperatives.

The value of the total plant and equipment owned by the cooperatives in 2006 amounted to \$3.6 billion, and it has been expanding at an average annual rate of 6.9 percent since 2002. Gross capital investment was \$366.7 million in 2006. It represents expenditures necessary to maintain and grow the capital stock of the cooperatives. It is calculated as the change in total plant and equipment plus depreciation.

While the primary mission of electric cooperatives is to provide reliable, affordable electricity, cooperatives also contribute to their communities through grant and revolving loan programs designed to foster longer-term community welfare. These programs provide funding for economic development initiatives, industrial parks, healthcare facilities, and other projects. Many of these projects are financed with rural economic development loan and grant funds (USDA LEDLG), which include zero-interest loans financed by the Rural Utilities Service, an agency of the United States Department of Agriculture, created to promote sustainable rural economic development and job creation as part of the Rural Electrification Act of 1936. Funds from these programs amounted to \$6.9 million in 2006.

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<sup>1</sup> In the case of Blue Ridge Electric Membership Corporation, for example, the purchase of electric power represented 66 percent of its operating expenses in 2006.

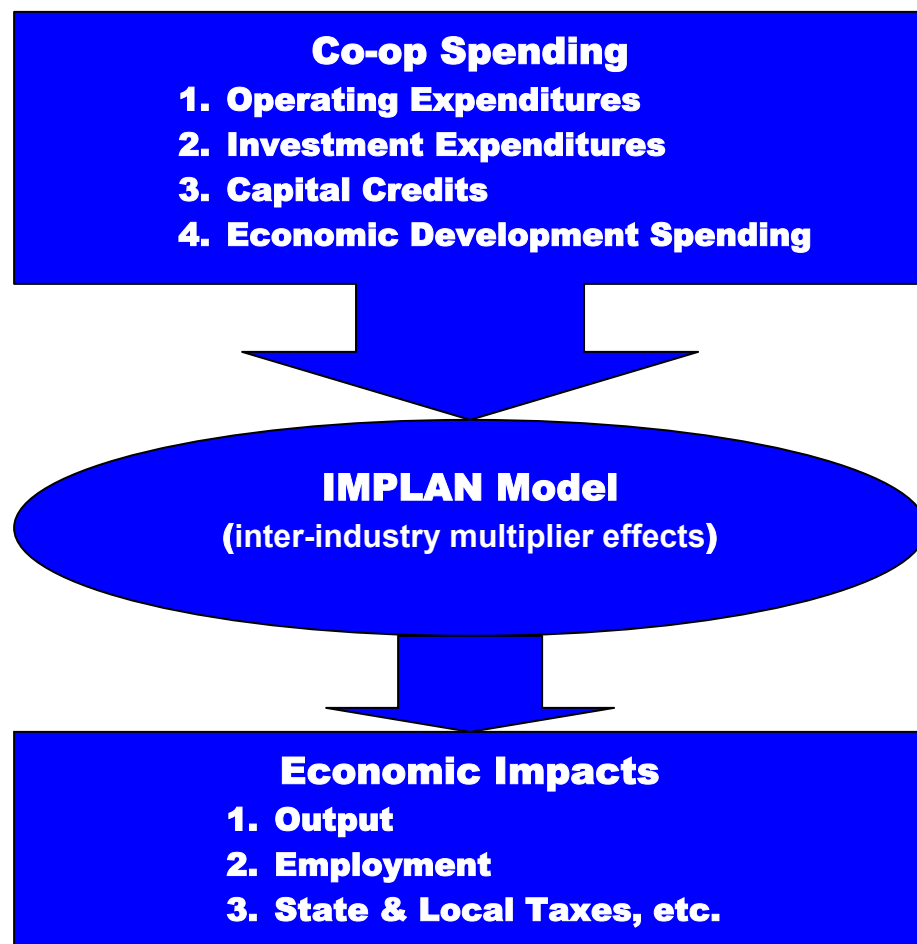
**Table 2: Operations of North Carolina's 24 Electric Distribution Cooperatives**

	2006	2005	2004	2003	2002	Ave. Ann. % Chg. 2006-02
<b>Revenues</b>	\$1,590,383,039	\$1,480,581,248	\$1,356,124,908	\$1,207,651,513	\$1,193,949,099	7.4%
<b>Expenses:</b>	\$1,548,375,158	\$1,435,064,223	\$1,320,110,705	\$1,162,281,211	\$1,137,878,050	8.0%
<b>Wages</b>	\$87,768,249	\$85,096,436	\$81,263,147	\$78,420,535	\$74,722,454	4.1%
<b>Other Operating Expenses</b>	\$1,197,137,115	\$1,118,799,236	\$1,020,191,008	\$880,409,445	\$862,264,073	8.5%
<b>Depreciation</b>	\$115,979,381	\$99,998,853	\$95,838,812	\$88,254,438	\$84,846,037	8.1%
<b>Interest</b>	\$89,896,342	\$78,065,726	\$67,320,486	\$63,753,374	\$64,614,916	8.6%
<b>Taxes</b>	\$57,594,071	\$53,103,973	\$55,497,252	\$51,443,419	\$51,430,570	2.9%
<b>Margin (Revenues less Expenses)</b>	\$42,007,881	\$45,517,025	\$36,014,204	\$45,370,303	\$56,071,049	-7.0%
<b>Capital Credits</b>	\$26,072,962	\$43,993,474	\$22,541,816	\$23,196,005	\$21,084,582	5.5%
<b>Total Plant and Equipment</b>	\$3,630,263,268	\$3,379,543,644	\$3,204,163,932	\$2,934,748,580	\$2,781,767,366	6.9%
<b>Gross Investment</b>	\$366,699,005	\$275,378,565	\$365,254,164	\$241,235,652	n.a.	15.0%
<b>Full-Time Employees</b>	2,383	2,392	2,372	2,309	2,321	0.7%
<b>Average Wage</b>	\$36,831	\$35,583	\$34,259	\$33,963	\$32,194	3.4%
<b>Eco. Dev. Funding</b>	\$6,888,612	\$3,154,831	\$4,571,349	\$4,531,258	\$7,023,185	-0.5%

## Methodology

Figure 1 depicts the basic conceptual framework for assessing the economic impact of electrical co-ops on the economy of North Carolina. North Carolina's electric cooperatives affect the North Carolina economy in four main ways: 1) operational expenditures of the cooperatives (including wages) increase the demand for the products of other industries and the earnings of worker households, 2) investment spending for new capital equipment raises the demand for products produced in various capital goods industries, 3) capital credits paid to customer households and businesses stimulate the spending of co-op members, and 4) grants and loans for economic development projects raise the spending of various community groups and institutions.

**Figure 1: Conceptual Framework of Assessing the Economic Impact of Electrical Cooperatives in North Carolina**



The analysis of economic impact is conducted using the IMPLAN® (Impact Analysis for PLANing) input-output model that divides the economy into sectors, defined by the good or service produced, where the outputs of one sector are inputs of another. IMPLAN analyzes a computer model that contains 509 sectors of the local economy and reflects the existing structure of the economy using data from the U.S. Department of Labor, Bureau of the Census, and the Bureau of Economic Analysis. IMPLAN was originally developed by the U.S. Forest Service and the University of Minnesota and is now marketed by

Minnesota IMPLAN Group, Incorporated. Active users of the IMPLAN model include: NC Dept of Commerce and the NC Department of Parks, Recreation, & Tourism Management.

Economic impact is measured in terms of 1) the total output (business receipts) of all industries in the state, 2) total number of new jobs created, 3) total value added (the sum of all final goods and services produced), 4) total amount of additional personal income (the income of all persons from all sources, including wages, profits, dividends, interest, rents, and transfer payments), 5) the total amount of additional labor income, and 6) total state and local tax revenue.

The basic input into the IMPLAN model is the level of spending by electric co-ops. Drawing from Table 2, co-op spending (direct effects) in 2005 and 2006 can be categorized as follows:

	2005	2006
Operating Expenditures	1,203,895,671	1,284,905,364
Investment Expenditures	275,378,565	366,699,005
Capital Credits	43,993,474	26,072,962
Eco. Dev. Funding	3,154,831	6,888,612
Total	1,526,422,541	1,684,565,943

These expenditures stemming directly from co-op operations affect the North Carolina economy through multiplier effects on state output, income, and employment. Each dollar spent generates additional dollars of output and income through successive rounds of re-spending within the state economy. The effects of this re-spending are termed multiplier effects.

The IMPLAN model separates the multiplier effects into 1) indirect effects and 2) induced effects. Indirect effects arise as the direct spending leads to additional rounds of spending in supplier industries. The indirect purchases (or indirect effects) continue until leakages (imports) from the state economy stop the re-spending cycle. The re-spending by various supplier industries induces higher income and spending in the household sector as employment and payroll in the supplier industries increase. The induced effects reflect the changes in spending by households as household income increases as a result of the increased production of supplier industries.

## Economic Impact of Electric Co-op Operations

The estimated impacts of the operations of the 27 electric distribution co-ops on the economy of North Carolina are shown in Table 3. In 2006, the direct effects of co-op operations totaled \$1.68 billion. As discussed above, this reflects the operating expenditures of the cooperatives, their investment expenditures, the capital credits paid to their members, and their expenditures in support of economic development programs.

**Table 3: Economic Impact of Electrical Co-ops, 2005-06**

2005				
Economic Impact	Direct	Indirect	Induced	Total
Output	\$1,526,422,541	\$217,377,919	\$287,390,678	\$2,031,191,138
Value Added	\$1,066,971,987	\$114,899,835	\$175,639,783	\$1,357,511,605
Personal Income	\$739,160,970	\$139,556,250	\$206,008,169	\$1,084,725,389
Labor Income	\$160,045,798	\$74,163,028	\$94,376,851	\$328,585,677
Employment	3,833	1,978	3,183	8,994
Average Wage	\$41,759	\$37,494	\$29,650	\$36,535
2006				
Economic Impact	Direct	Indirect	Induced	Total
Output	\$1,684,565,943	\$239,282,289	\$317,052,071	\$2,240,900,303
Value Added	\$1,177,514,497	\$126,417,623	\$193,767,446	\$1,497,699,566
Personal Income	\$815,740,965	\$139,556,250	\$206,008,169	\$1,161,305,384
Labor Income	\$176,627,175	\$81,736,877	\$104,117,419	\$362,481,471
Employment	3,819	2,180	3,512	9,511
Average Wage	\$46,250	\$37,494	\$29,646	\$38,112

In 2005, the funds expended directly by electrical cooperatives generated multiplier effects throughout the state economy. Because of the direct, indirect, and induced effects of co-op operations, total output (or total business receipts) was higher by \$2.03 billion. Value added (equivalent to state gross domestic product) was larger by \$1.36 billion. Personal income was higher by \$1.08 billion, and labor income larger by \$329 million. A total of 8,994 jobs were created at an average wage of \$36,535.

In 2006, the total output of all goods and services sold by all industries in the state was higher by \$2.24 billion. The state's value added was larger by \$1.50 billion. State personal income was higher by \$1.16 billion, and labor income was larger by \$362 million. Total employment in the state was higher by 9,511 jobs. The average annual wage of the new jobs created was \$38,112, or 1.8 above the state average in 2006.

State gross domestic product (GDP) in 2006 was \$374.5 billion, which represents the sum total of all final goods and services produced in the state (or the total value added by the state economy).<sup>2</sup> Comparing this number to the total value added by electric co-ops (Table 3) suggests that co-ops contribute 0.40 percent of state GDP. The 9,511 jobs resulting from co-op operations in 2006 represent 0.24 percent of the state's total employment of 3,956,664.

The total impact of co-op operations has been expanding because of the growing size of co-op operations. The direct expenditures of co-ops increased from \$1.53 billion in 2005 to \$1.68 billion in 2006, a gain of

<sup>2</sup> Bureau of Economic Analysis (see, <http://www.bea.gov/region/regional/gsp.htm>).

9.8 percent (Table 3). As a result, the total impact on the output of all industries in the state jumped 10.3 percent between 2005 and 2006.

Table 4 shows the ten industrial sectors (excluding the utilities sector) where output is most strongly impacted by the direct, indirect, and induced effects of co-op operations. The industrial classifications are 2-digit NAICS (North American Industry Classification System). Table 4 shows the total direct, indirect, and induced effects on industry output in 2006. Manufacturing, government, and healthcare are the three sectors most strongly impacted.

**Table 4: Output Effects by Industrial Sector, 2006**

Rank	NAICS Sector (2-digit)	Output Effects
1	31-33 Manufacturing	\$58,166,876
2	92 Government	\$51,807,244
3	62 Health & Social Services	\$46,737,692
4	48-49 Transportation & Warehousing	\$46,556,516
5	44-45 Retail Trade	\$43,750,472
6	52 Finance & Insurance	\$42,709,392
7	21 Mining	\$33,633,788
8	53 Real Estate & Rental	\$32,914,862
9	54 Professional, Scientific & Technical	\$32,398,228
10	23 Construction	\$29,376,502

Table 5 shows the industrial sectors (excluding the utilities sector) where employment levels are most strongly affected by the direct, indirect, and induced effects of co-op operations. Table 5 shows the total direct, indirect, and induced effects on industry employment in 2006. Retail trade, accommodations and food service, and healthcare are the three sectors where co-op operations have the largest employment impact.

**Table 5: Employment Effects by Industrial Sector, 2006**

Rank	NAICS Sector (2-digit)	Employment Effects
1	44-45 Retail Trade	852
2	72 Accommodation & Food Services	694
3	62 Health & Social Services	671
4	81 Other Services	497
5	54 Professional, Scientific & Technical	393
6	23 Construction	381
7	48-49 Transportation & Warehousing	348
8	56 Administrative & Waste Services	301
9	52 Finance & Insurance	237
10	31-33 Manufacturing	236

Cooperatives are exempt from corporate income tax at the state and federal levels because of their non-profit status. However, they are subject to sales, property, and other taxes. In addition, the indirect and induced effects that arise from co-op operations generate additional state and local tax revenue. Table 6 shows the total state and local taxes in 2006 that resulted from the direct, indirect, and induced effects of co-op operations. Co-op operations fostered \$224.5 million in additional state and local tax revenues. Of

this, \$90.0 million were from sales taxes, \$78.4 million from property taxes, \$19.5 million from income taxes, and \$36.6 million from other state and local taxes. State and local taxes represent 10.2 percent of the total output (business receipts) generated by electric cooperatives in 2006.

**Table 6: Total State and Local Taxes Generated by Co-op Operations, 2006**

<b>State &amp; Local Taxes:</b>	<b>Tax Effects</b>
Sales Taxes	\$89,997,386
Local Property Taxes	\$78,381,571
State Income Tax	\$19,540,262
Other State & Local Taxes	\$36,568,462
<b>Total</b>	<b>\$224,487,681</b>

## Background of the Principal Investigator

G. Donald Jud is Professor Emeritus of Finance in the Bryan School of Business and Economics at the University of North Carolina at Greensboro and principal of JUD & ASSOCIATES. He has taught courses in economics, finance, and real estate. Dr. Jud received his Ph.D. from the University of Iowa and MBA and BA degrees from the University of Texas. He is author of over 80 academic articles and three books.

Dr. Jud serves on the editorial boards of the *Journal of Real Estate Finance and Economics* and the *Journal of Real Estate Literature* and is a member of the *Appraisal Journal's* academic review panel. He is a past editor of the *Journal of Real Estate Research* and continues to serve as a member of its editorial board.

Dr. Jud is a past president of the American Real Estate Society (ARES) and former ARES Director of Publications. He is a National Association of Industrial and Office Properties (NAIOP) Distinguished Fellow and a Research Fellow of the Homer Hoyt Advanced Studies Institute, where he is an emeritus member of the Weimer School Faculty and the Board of Directors of the Institute. Dr. Jud's research has appeared in numerous academic and professional journals including the *Appraisal Journal*, *American Real Estate and Urban Economics Association Journal*, *Journal of Real Estate Finance and Economics*, *Journal of Real Estate Research*, *Journal of Housing Economics*, *Journal of Financial Education*, *Journal of Real Estate Portfolio Management*, *Journal of Real Estate Practice and Education*, *Real Estate Issues*, *Journal of Property Research*, *Journal of Financial Economics*, *Land Economics*, and *Urban Studies*.

Dr. Jud has been a research consultant to Wachovia Bank, NC Department of Commerce, the Piedmont-Triad Partnership, the National Association of Realtors®, the NC Association of Realtors®, the Greensboro Chamber of Commerce, Downtown Greensboro, Inc., the Greensboro Regional Realtors® Association, the City of High Point, NC, the Town of Boone, NC, the North Carolina Association of Electrical Cooperatives, CME Merchant Energy, Home Builders Assn. of Burlington-Alamance County, Triad Real Estate and Building Industry Coalition (TREBIC), the Brown Investment Properties, the Reynolds Companies, Woods Partners, the Starmount Company, the Carroll Companies, Cone Denim, and RMIC Corporation.