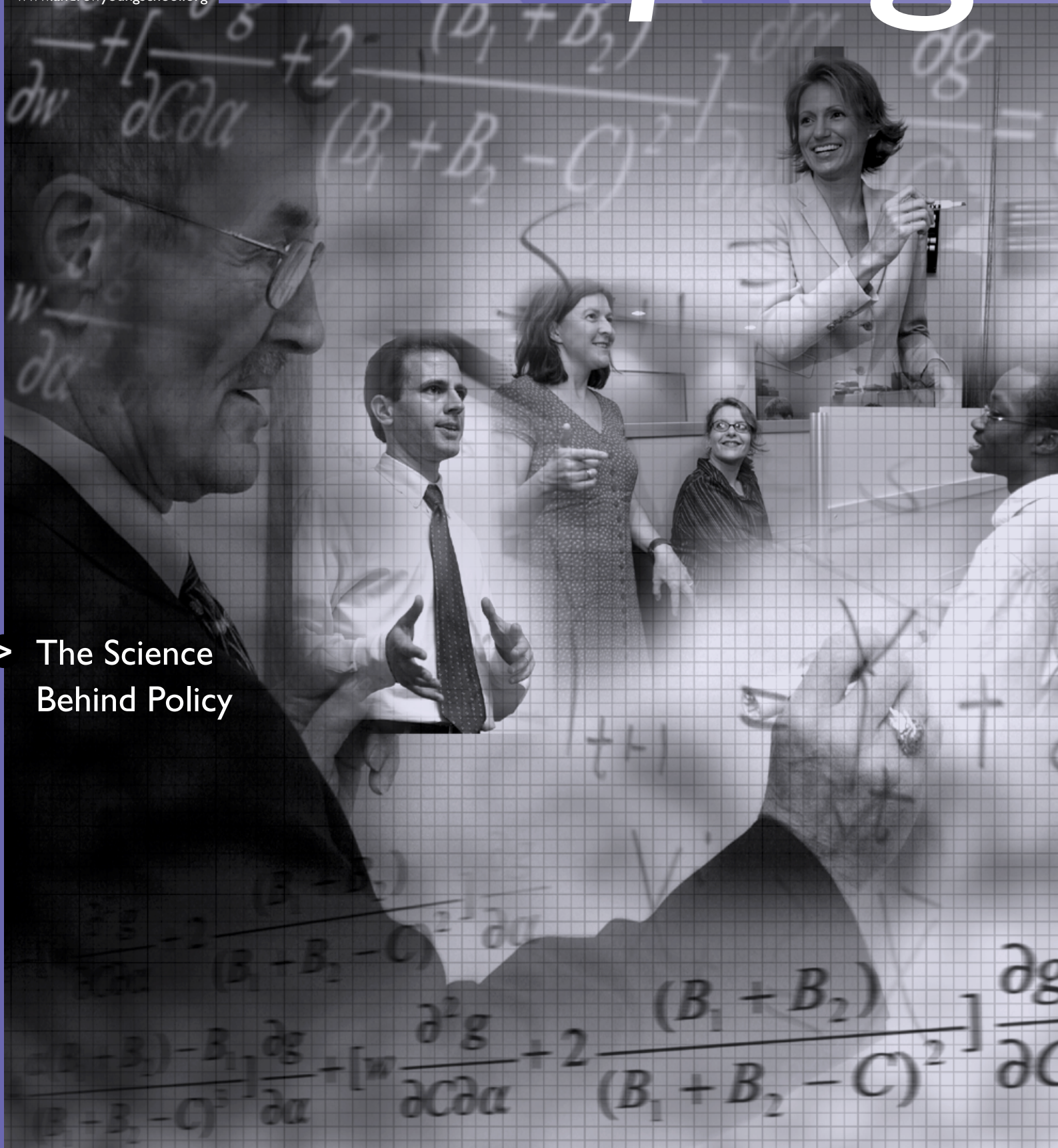


# The Briefing

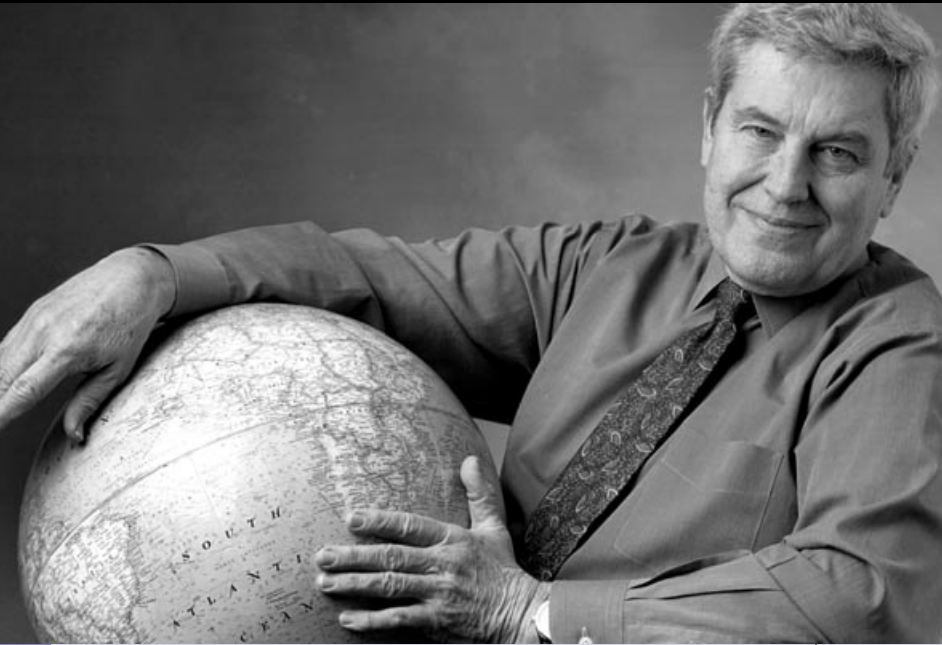
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> The Science Behind Policy



## MASTERING THE

## Science of Policy Analysis



*The mission of the Andrew Young School of Policy Studies is to promote excellence in the design, implementation and evaluation of policy through research, teaching and outreach.*

primary fields, public finance and budgeting, and urban policy, we rank among the top ten schools in the nation. In this issue you will see that our research and programs have expanded into related fields. Right now, we are hot.

Rigorous policy studies are based in theory and empirical analysis. In our college, we regularly use the major empirical tools of the social sciences – statistics and econometrics, survey research and experimental methods – to break new ground in answering some of the toughest policy questions.

How do we pay for this research? Our strategy is to focus on our areas of special expertise, to give policy makers the kind of research that they value and to be aggressive about raising necessary resources. The results are more than astounding. We are currently raising about \$1.7 million in external funds for every \$1 million in budget provided to our college. According to the National Science Foundation, our economics department alone ranks in the top ten nationally for its success in attracting external funding.

Can you imagine working in the midst of this scholarship, having important political leaders testing and using this work on a regular basis, and dealing every day with government officials and students from all over the world? I hope you will read these features that describe some of the policy science underway in the Andrew Young School. Maybe you will get the same feeling I have when I get to work every morning: this is one of the most exciting academic settings imaginable.

Roy Bahl  
Dean

**T**he science of policy analysis, still developing, is incredibly exciting. This emerging research field brings to the same table social science researchers, management specialists and those in government and the private sector who must implement policy.

The Andrew Young School sees its role in this process as providing rigorous and relevant analytic work to help guide the design and implementation of policy. As you will read here, our faculty and research associates have become national leaders in the policy sciences by taking this research to new levels.

From that day in 1996 when we became a college, we have emphasized scholarly rigor in research. Scholarship is the base upon which we have built this school. We set two standards for success: acceptance by the academic community, and the use of this work by those who must form and manage policy. “Ask good questions and study them deeply.”

Our faculty and staff now publish about 250 scholarly papers and books each year and present this work in academic forums around the world. Their research is finding its way into real world applications, in Georgia, around the United States and in other countries. We are seeing the benefits of this effort. Applicants for our doctoral study programs this year were ten times greater than the number of spaces we had. *U.S. News & World Report* has reported that in two

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The Andrew Young School's policy research is easy to access; it is published in numerous academic and professional journals and cited in any number of related studies. It is used to teach in classrooms around the world. This issue of *The Briefing* is merely an introduction to the breadth and depth of the research conducted by our faculty and staff. You are invited to go to [www.andrewyoungschool.org](http://www.andrewyoungschool.org) to find full research citations in the AYSPS annual reports.



# experimental economics

## SHAPES ENVIRONMENTAL POLICY

"How much is a river worth?" "What would happen if it could no longer be used for irrigation or for navigation?" Although such questions may seem impossible to address, a growing body of hard research is being used to measure the economics of environmental policy. The Andrew Young School is in the forefront in developing and applying experimental economics, this new approach.

AYSPS economists use the Experimental Economics Lab, a state-of-the-art research facility, to study the relationship between rules, incentives under those rules, and outcomes. A highly regarded tool used in select universities around the world, the experimental lab at AYSPPS is the most advanced in the Southeast and ranks as the second or third best in the nation. Ron Cummings, director of the Environmental Policy Program, said it helps improve and strengthen the school's policy consulting to government and the private sector. "We frequently conduct lab experiments to formulate policies that best encourage desired actions or compliance."

The school's experimental economics lab consists of 24 network computer stations and a mobile lab with 30 notebook computers with links to the Internet. It tests subject behavior towards proposed policies under conditions where the experimenter knows the values (or costs) of all conditions, imposes rules, and then observes subject behavior under those rules. "So long as the design of the experiment adequately parallels the real world situation it is intended to mimic," said Cummings, "the data obtained from the experiment can provide decision makers with unique information as to how people will actually behave under the policy rules in question."

### Will that policy work?

Cummings and Susan Laury, the lab's associate director, used experimental economics to search for rules that would best serve the water auctions the state must hold to meet compliance of the Flint River

Drought Protection Act of 2000. The Georgia Environmental Protection Division was looking for a way to provide farmers with the economic incentive necessary to submit offers closer to the income they thought they would lose if they did not irrigate in a drought year.

After experiments with different auction rules, Cummings and Laury designed a "repetitive bidding" auction process and demonstrated that it would provide the incentives the EPD sought. The EPD conducted these auctions in March, 2001 at eight sites in southwest Georgia, where 208 water use permits accounting for 33,101 irrigated acres were purchased by the EPD for \$4.5 million. Flint River flows were increased 165 cubic feet per second during critical summer months.

The lab was used again to revise the auction process for 2002. Additional experiments led Cummings and Laury to develop alternative rules that might accomplish the EPD's goals. The result was an altered "posted price" auction conducted last March. Offers were accepted for 276 permits involving 40,861 acres for \$5.2 million, reducing the average cost per acre by 7.8 percent. Experimental economics clearly demonstrated the incentives that would prove most successful in helping the EPD meet its goals.

### Enhancing Environmental Policy

The Environmental Policy Program works to enhance the quality of environmental policy in Georgia and to develop management sys-

## T H E L I T M U S

**The Experimental Economics Lab allows researchers to test economic theory before a new policy is adopted.**

An AYSPS scholar assisting a developing country in establishing tax policies may have a theory that the lower the tax rate is set, the greater compliance will be. A higher compliance rate also may be achieved by investing more in enforcement or by introducing stiffer penalties.

It is one thing to tell a tax administrator that an economic theory suggests she should lower the country's tax rate and toughen enforcement so more citizens will pay all taxes owed. It is quite another to predict how much revenues will increase with the lower rate or with tougher enforcement. Experimental economics allows such estimates to be made.

Here's how it works. A test group is recruited for an experiment conducted in the AYSPS experimental lab, a room that accommodates up to 24 people at computer terminals. Because each screen is "walled off," participants (subjects) cannot see what is on

### THE ENVIRONMENTAL POLICY RESEARCH TEAM



Laura Taylor

Working closely with Ron Cummings and Susan Laury, assistant professor and senior associate in the Environmental Policy Program, are: Paul Ferraro, assistant professor of economics, a specialist in resource and environmental economics; Laura Taylor, associate professor of economics, associate director of the program and a specialist in natural resources and environmental economics; and Ragan Petrie, a specialist in experimental economics methods, who this August joined the faculty as assistant professor of economics.



Susan Laury, assistant professor and Environmental Policy Program senior associate

*“We frequently conduct lab experiments to formulate policies that best encourage ... compliance.”*

Ron Cummings

tems for natural resources replicable for other places. Current projects address management issues and air quality and ozone reduction costs and impacts, along with water resource policy. Cummings developed the program with two goals: to design flexible incentive-based policies to resolve Atlanta’s ozone problem in collaboration with the EPD, and to create the Georgia Water Policy and Planning Center, a center of excellence for collaborative research in water resources policy – the first in the Southeast.

#### Back to the lab

AYSPS faculty members are publishing a growing body of research showing more effective outcomes resulting from their study of human behavior in the Experimental Economics Lab. Its use is not limited to research, however. Students are provided hands-on experience in applying basic economic concepts; as they participate in experiments they see theoretical results revealed as real-life outcomes.

Joint research partners have included the Oak Ridge National Laboratory; the universities of Botswana, Pretoria, New Mexico, Georgia, Georgia Tech and Texas A&M; and groups such as the Partnership for a Smog-Free Georgia. The program attracts major grants from organizations such as the National Science Foundation, the U.S. Environmental Protection Agency and the U.S. Department of Energy.

3

## TEST FOR RELEVANCE

each other’s screen or the decisions they make. Subjects are given an income of, say \$100 in real money, but are told that:

- they must pay a tax on this income, at a rate of 20 percent;
- they can report any amount of income between \$0 and \$100, and pay the 20 percent taxes on the income they report (if they report \$0 income, they pay no taxes; if they report income of \$50, they would pay \$10 in taxes instead of the \$20 they owe on their true income of \$100); and
- the amount of income they report may be “audited” by the computer and they are given this probability (say, 10 percent). They learn that if they are audited and have under-reported their true income, they will pay a penalty.

Under these rules, subjects decide the amount of income they will report. Then they are asked to make a second decision. The same case is made – subjects are given \$100 and the rules are explained – except this time the tax rate of 20 percent is lowered

five points. Subjects make their decisions, and are then asked to make a third (or fourth, or fifth...) decision with a lower tax rate each time. They know they may walk away with some money in hand, which helps them act as they would in real life.

The outcome after many repetitions of this experiment is a set of observations of how people behave — in this case, how much of their true income they report in response to lower tax rates. Results are analyzed with sophisticated economic models and are translated to concrete action plans that can provide tax administrators with estimates of the impact of alternative policy choices.

This is the essence of experimental economics: under conditions where the researcher knows the values (or costs) of all conditions, rules are imposed and then subject behavior is observed. The data obtained from the experiment provides unique information as to how people will behave under the rules in question.

# eminent scholar

## JOINS SCIENCE & POLICY



**RONALD G. CUMMINGS**, director of the Environmental Policy Program, came to Georgia State University in 1993 as the Noah Langdale Jr. Eminent Scholar in Environmental Policy. He is the only economist in the Eminent Scholar program, which was created by the Georgia Research Alliance (GRA) to attract strategic science and technology investments to the state by recruiting top researchers to Georgia from throughout the world to fill endowed chairs. The *Wall Street Journal* has called this approach, “the new definition of economic competition among the states.”

Cummings joins 36 Eminent Scholars in successfully competing for a disproportionate share of funded research, in attracting sought-after graduate students, and in generating industry and company interest in scholarly research.

“Ron Cummings is concerned not about esoteric economic theory, but about how economic policy affects the quality of each of our lives,” said C. Michael Cassidy, president of the Georgia Research Alliance. “Since coming to Georgia, he has helped the state deal with one of its most challenging issues – the allocation of scarce water resources. His effort to establish centers at Albany State University and Georgia Southern University has brought together business, community organizations and government groups to solve the state’s ongoing water use problems.”

Closer to home, the Andrew Young School has leveraged the GRA’s investment in Cummings and the Experimental Economics Lab to attract research grants averaging up to a million dollars a year. The program has established an international reputation for excellence in teaching and research in its specialty fields – environmental policy and experimental economics – allowing it to compete in the international market for programmatic support.

According to Dean Bahl, graduate students, research faculty and visiting fellows have come to the school from around the world to work with Cummings. In the next few years this program’s influence will grow as it expands environmental policy technical assistance and training into more international markets.

Cummings’ scholarly work in natural resources and environmental policy analysis spans more than three decades. His latest research studies the economic impact and trade-offs associated with environmental damage assessments, voluntary mechanisms for ozone reduction, solid waste management, and water resource management and conservation.

**Ron Cummings is concerned not about esoteric economic theory, but about how economic policy affects the quality of each of our lives.**

C. Michael Cassidy  
President  
Georgia Research Alliance

### [ RELATED READING ]

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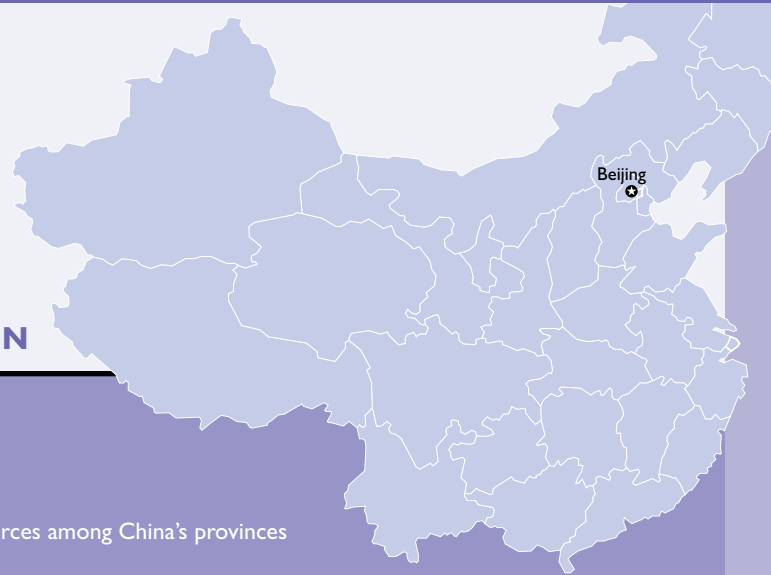
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# examining tradeoffs

## IN FISCAL DECENTRALIZATION



### Fiscal decentralization tradeoffs found in China

- > Fiscal decentralization significantly affected economic growth
- > These policies led to increased inequalities in the distribution of fiscal resources among China's provinces
- > Central decision makers face a tough choice as they "trade" between the objectives of more growth and more equity



Jorge Martinez-Vazquez, director,  
International Studies Program

**Fiscal decentralization occurs in a country when the power to tax and spend is shifted from central governments to state and local governments. This policy issue is of major importance to countries throughout the world. AYSPS faculty members have developed a considerable reputation for their knowledge and**

**consulting on fiscal decentralization projects; they number among the world's leading scholars in this subject.**

The impact of decentralization on economic growth and income distribution by region is widely discussed in economics literature, according to Jorge Martinez-Vazquez, director of the AYSPS International Studies Program. "Although there appears to be an agreement that unfettered fiscal decentralization can lead to a concentration of resources in a few regions," said Martinez, "no one had done, that we are aware of, an empirical analysis of this policy on the geographic distribution of resources."

Martinez and his colleagues, AYSPS associate professor Yongsheng Xu and Baoyun Qiao have now provided this evidence in their research, "Growth and Equity in Decentralization Policy: China's Experience." They have developed and tested a theoretical model of the impacts of decentralization on regional equity.

For this research, Martinez, Qiao and Xu developed a theoretical model to examine the tradeoff between growth and equity in the context of China's fiscal decentralization policy. The model assumes that national economic growth and an equitable distribution of fiscal resources among regional governments are the two objectives pursued by central policy makers. This model allowed them to investigate the conditions under which a policy trade-off between growth and resource distribution would arise. They tested the model predictions with data

from 1984 to 1998 in China's fiscal decentralization.

They found that "while the rate of economic growth in China was quite high over the last two decades, inequality in the distribution of fiscal resources across local governments had increased significantly. In recent years, this distribution had become noticeably more unequal, while economic growth had slowed."

"The results confirmed the proposition of our theoretical model," said Martinez, who notes in the paper that "the formulation of fiscal decentralization policy generally faces a trade-off between economic growth and equity in the geographical distribution of fiscal resources." Several important new findings resulted from this research on China.

- Fiscal decentralization significantly stimulated economic growth.
- Decentralization policies in China led to significant increases in inequality in the geographical distribution of fiscal resources. This inequality was positively related to economic growth. Higher economic growth led to more inequality.
- China's second major decentralization reform, termed the "Tax Sharing System" of 1994, did not improve equity in the geographical distribution of resources, nor did it improve economic growth. In fact, a higher degree of reliance on funds outside the control of the regular budget has led to more inequalities in the distribution of fiscal resources.

Martinez, in collaborations with the World Bank, has traveled to China several times. "We work with officials from provincial and local governments in the regions, and with the Ministry of Finance in Beijing," said Martinez. A side benefit is that he brings his work back into the classroom, encouraging his students to learn from in-country experts like the three officials from China's Ministry of Finance who visited this semester.

Martinez hopes that this empirical research will help clarify some of the realities for government officials in China as they debate the impact of the decentralization policy. What China does about this trade-off between economic growth and the regional distribution of resources "may represent the most important and





Mr. John Hicks, Assistant Provost, International Affairs; Andrew Young; P. J. Patterson, Prime Minister of Jamaica; and Dean Roy Bahl

# strategic

## Strategic apportionment and corporate income tax

- > Strategic apportionment policies initially produce minimal effects on production that become more positive in the long run; their effect on revenue collections tend to be larger and are felt immediately
- > These policies make the greatest difference in relatively small states with high tax statutory rates and capital-intensive industries

**The International Studies Program** provides academic and technical training, research and technical assistance in support of sound public policy, and sustainable economic growth to developing countries and those with economies in transition. Director Jorge Martinez-Vazquez and staff have shared their expertise in fiscal policy, public administration, budgeting and financial management, tax administration, fiscal decentralization and intergovernmental fiscal relations, and economic analysis and revenue forecasting with more than 40 countries in programs sponsored by USAID, The World Bank and other global agencies.

difficult decision currently facing Chinese authorities as they continue to develop policy in intergovernmental fiscal reforms, or those that occur between their divisions of government. These are also important issues for other developing countries with active decentralization programs.”

China's reform efforts offer an excellent case study of a major developing country attempting to modernize its fiscal system, said Dean Bahl, who wrote a major text on its efforts, *Fiscal Policy in China: Taxation and Intergovernmental Fiscal Relations* (The 1990 Institute: University of Michigan Press, 1999). “China redefined its intergovernmental fiscal relations, and adapted its tax structure and tax administration to fit a rapidly rising market economy,” said Bahl.

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Coca-Cola, Delta Air Lines and UPS, all headquartered in Georgia, earn income from all over the world. What share of this income can the state claim with its corporate income tax? Is there a tax strategy that is at the same time fair to all companies that do business in Georgia, which also will produce sufficient revenues and be friendly to economic development?

Kelly Edmiston, assistant professor, researches this last question with a set of economic models that he has developed. He has found that a state's apportionment formula may have surprising implications for its revenue collections as well as its ability to attract business investment.

How is apportionment normally applied? Before a state taxes the net income of a multistate corporation, it must identify the corporation's share of nationwide income that can be attributed to activities occurring within its boundaries. Generally this determination is made by using a “three-factor formula,” or a weighted average of the state's share of the firm's total payroll, property and sales values.

In the past, most states had placed an equal, one-third weight on each of these three factors. Recently, however, many states have placed a disproportionately heavy weight on the sales factor and have lowered the effective tax on the productive factors: payroll and property. For example, Georgia's apportionment ratios are weighted 25 percent for payroll, 25 percent for property and 50 percent for gross receipts. The hope has been that a lower tax burden on payroll and property will encourage more production within the state.

Edmiston employed a technique known as computable general equilibrium (CGE) analysis to look at the pros and cons of imposing a “strategic apportionment” formula, his term for an apportionment formula modified specifically to make a state more attractive than its peers in competition for business investment.



# apportionment

## A FIX FOR CORPORATE TAX POLICY?



“...the apportionment game is a prisoner’s dilemma: regardless of the strategies of other states, each state’s best economic development strategy is a single-factor sales formula.” *Kelly Edmiston*

Edmiston’s research examined the effectiveness of “strategic apportionment,” a single-factor apportionment formula that places a 100 percent weight on sales, in stimulating economic development, and explores the various factors that determine its effectiveness. He also investigated the revenue and welfare implications of strategic apportionment policies.

Using an eight-region, eight-sector applied general equilibrium model, Edmiston found that when imposed independently, single-

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**A note about CGE:** Edmiston successfully used a methodological approach still new in its application to research in this area. The Computable General Equilibrium model uses an integrated system of nonlinear simultaneous equations to simulate the circular flow of income in a market. This tool is used to study the allocational and distributional effects of economic policies and the implications of economic shocks, and is useful in economic impact analysis.

“The greatest benefit of CGE analysis is that it allows researchers to explore issues for which there is little or no data available for empirical study, those for which analytical or theoretical approaches are difficult to manage or govern.” In his research, Edmiston was able to explore related questions that had been impossible to answer using such approaches, such as how the impact of apportionment change might vary across regions.

factor sales policies may have substantially positive economic development impacts in the very long run, but that the magnitude of these effects varies considerably across regions according to their individual characteristics. If all regions act simultaneously, however, there are very clear winners and losers, and the competitive economic development landscape is markedly reshaped. For example, if Georgia were to impose a single-factor sales formula while its neighbors maintained less aggressive formulas, it would likely see significant gains in economic development over the long run. But if its neighbors were to impose a single-factor sales formula in response, which is likely, Georgia may end up a net loser. That is, it may have been better off had it not started an apportionment “war.”

“In essence,” said Edmiston, “the apportionment game is a prisoner’s dilemma: regardless of the strategies of other states, each state’s best economic development strategy is a single-factor sales formula.” He also found that the revenue consequences of strategic apportionment policies – or the impact of this policy change on revenue collections, which are under-appreciated in both the literature and in

*continued on back cover*

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# microsimulation

## Georgia's income tax structure

- > While Georgia's tax rates are similar to those in other states, the top income bracket is reached at a lower income level than in other states, making it close to a flat rate income tax
- > Georgia's retirement income exclusions are relatively generous
- > The personal exemption and deduction levels are somewhat lower than average and therefore bring more low-income people into the tax net
- > The structure does not allow indexation, or inflation adjustments, of rates or brackets

**Microsimulation is a computer modeling technique that can lead policy analysts to answers on tax and related issues. Sally Wallace, associate professor of economics at AYSPS, uses sophisticated computer modeling to analyze the tax systems in Georgia, other states and abroad to point to policy options that will modernize income tax structures. Her work has been recognized by leading economists, and has been used by government officials in Georgia, and in other states and countries.**

In "The Georgia Income Tax: Suggestions and Analysis for Reform," Wallace and Barbara Edwards, one of her former doctoral students, used microsimulation to recommend options for income tax reform. They estimated the impact of a number of changes to the Georgia tax code, including changes in the flat rate, structural changes in retirement deductions, indexing for inflation and reducing the tax burden of lower-income households.

What they found about the taxation of low-income Georgians was particularly interesting. "Georgia processes about 3.2 million income tax returns annually, worth about \$5.5 billion in revenue," said Wallace. "If the state's 300,000 lower-income taxpayers were dropped from the rolls by increasing personal exemptions and standard deductions to federal levels, individual income tax receipts would fall by less than 10 percent. Administrative costs would also fall."

On the question of retirement benefits, the model showed that the level of income exemptions in Georgia is relatively high and elimination of these exemptions would increase state income tax revenues by 1.5 percent.

Wallace and Edwards conducted this study to point the state's policy leaders toward future adjustments and policy options in the income tax code. "I had the opportunity to work with Professor Wallace while co-chairing the Joint Revenue Structure Study Commission. Her presentations reflected her knowledge and thorough research of the income tax structure," said Senator Terrell Starr, president pro tempore of the Georgia Senate. "She is a delight to work with, an excellent communicator and delivers innovative ideas to complex issues."

Wallace has introduced microsimulation models to economies as diverse as Ohio, Guatemala and Russia. In Russia, the methodology was used to show the heavy tax burden that was imposed on workers. "We bring a useful, analytical tool, often for the first time, to places that could not do much in the way of tax policy analysis because they did not have microsimulation models. Our breakthrough is in integrating what we've found in other areas of analysis into a policy analysis tool that can take a very comprehensive look at the effects of tax law changes," she said.

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**Sally Wallace** is among a select group of scholars who use microsimulation models to analyze tax systems and to advise U.S. governors and legislators and foreign ministries of finance. She is a member of the advisory board for the Internal Revenue Service Statistics of Income Group, and was formerly a senior economist for the U.S. Department of the Treasury.

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# models

## REVEAL EFFECTIVE OPTIONS

*“If the state’s 300,000 lower-income taxpayers were dropped from the rolls ... individual income tax receipts would fall by less than 10 percent.”*

Sally Wallace

**About Microsimulation Models** Microsimulation models are based on micro data, or data derived from individuals or companies. Each individual (or company) is treated as an individual data observation, or “record.” Each of these records contains information on income, dependents and deductions (such as mortgage interest and state and local taxes), charitable contributions, business expenses, etc. In the case of the Georgia model, there are 60,000 such records.

A computer program is then written to apply the existing tax law to each record, that is, the actual tax liability for every one of these persons in the sample is calculated. Then the simulations begin. The impact of changes in the tax code – everything from rate increases to changes in deductions – is run through the model and hypothetical new tax liabilities are calculated.

The simulation module may simply calculate the tax, assuming that individuals and firms do not react to the tax law changes (a static model), or the module may estimate the effect of tax law changes when individuals and firms do react by changing how much they work, how they spend, or how firms produce (a dynamic model). The behavioral responses are estimated based on economic studies of how individuals and corporations have reacted to past changes in the tax structure.

Finally, microsimulation models provide an output module, which categorizes taxpayers (individuals or corporations) by income group, and summarizes tax burdens, taxes paid, “winners and losers,” and the overall change in revenue. This is the result that is most interesting to legislators. In one run of the microsimulation model, a legislator or governor can see how a combination of a new rate structure, a new deduction schedule or even a new set of assumptions about performance of the economy will impact the level of expected revenues and the distribution of tax burdens among higher and lower income taxpayers.

Microsimulation modeling has become a crucial tool for tax policy analysis exactly for the reason that it can let economists estimate, in one sweep of the computer program, the total impact of a complex set of changes of the tax code.



## DYNAMIC PERSPECTIVE

## reshapes land use policy

**Dynamic analysis: What it can add to land planning policy**

- > The key to understanding capital and real property markets is to recognize their inherently dynamic nature
- > Policy design and evaluation requires a firm grounding in how urban real estate markets respond to different types of land use and tax policies
- > Dynamic analysis can be used to show how regulations can distort investment incentives and lead to inefficient and unintended land development patterns over time

Land use decisions and disputes often make headlines. Changes in zoning ordinances, lawsuits over development impact fees, rising property values and new environmental restrictions generally raise the ire of land owners and may force unintended and undesirable property uses. Geoffrey K. Turnbull, an AYSPS economics professor, looks not only at how a parcel of land can and will be developed (a “static” perspective), but also at when the parcel will be developed. He uses this time element, the “dynamic perspective,” to explain why even an implicit threat of regulation can lead to faster development and other unintended and inefficient impacts.

In his latest report, “Land Use Policy and Investment Incentives,” (FRP Report No. 73, June 2002), Turnbull synthesizes recent studies of how land use regulations affect investment incentives for land development and uncovers the dynamic effects of such policies. While many widely accepted methods used to design and evaluate land use policies are based on static analysis, he studies the timing decision. His research offers solid evidence why those who determine land use policy should consider the dynamic perspective a more effective method for discovering the full impact of proposed changes in land use regulations.

Turnbull uses a sophisticated economic model to explain the differences between static and dynamic perspectives in urban real estate markets and why these differences are important in the policy realm. While a static perspective shows how a particular parcel of land can and will be used when developed (i.e. single-family housing, higher-density townhomes or a strip mall), the dynamic perspective also takes into account when the parcel will be developed. The real estate market determines the connection between how the land will be used once developed, when such development would begin or whether it ever will be developed.



**Geoffrey K. Turnbull** uses a wide range of analytical tools in his academic research: applied theoretical analysis, simulation models and econometric methods. His research in the last five years falls under the broader category of urban and real estate economics, with a focus on local public finance, land and urban economic development, and the economics of property law.

Examples from current research illustrate why policy specialists should try to understand how the urban real estate market determines this connection between the ultimate use and development timing. They show situations in which regulations like zoning, development moratoria, development fees and property taxation can distort investment incentives and lead to land development patterns that policy advocates often find troubling.

“It often takes years for discoveries in one field to become available to a broader audience, especially in economics where some of the primary research can appear to be arcane and too abstract to be of much use to policy makers,” said Turnbull. His research on the consequences of land use policy helps to bridge this gap between academics and the policy specialists who can benefit from this economic analysis.

“This research should be of value to elected officials and others in local governments as they work to determine policies,” said Turnbull. “By probing the relationship between property rights and the pace and pattern of urban development, it creates an overview that is accessible to specialists in land use policy.”

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# FLAWS FOUND IN POPULAR property tax assessment freeze

## Problems in setting property assessment limits

- > By themselves, assessment freezes will not control property tax growth; other taxes and fees are often increased to offset reduced property taxes
- > Freezes do not apply to state taxes; a county must maintain two assessed values on a property
- > Assessment limits create large disparities in property taxes
- > This policy has a minor impact on mobility, doing little to increase the stability of a community

“No one looks forward to property tax increases, especially those resulting from an increase in value that is not realized until the property is sold,” said David Sjoquist, director of the AYSPS Fiscal Research and Domestic programs. As concerns about gentrification, or the rising costs of homeownership to citizens on fixed incomes, gain momentum, policy leaders are responding with a number of property tax relief policies. Sjoquist, who has studied property tax issues for nearly three decades, says his research suggests that several of these reforms have serious implications for property tax equity.

One reform increasingly under consideration limits a property’s assessment increase. Seven states have such limitations. In Georgia, several counties have adopted programs that actually freeze the value of property for homeowners until the property is sold. In a study with Lakshmi Pandey, “Limitations on Increases in Property Tax Assessed Value,” Sjoquist notes the political pressure exerted to impose controls on rapidly rising property taxes and the appeal of limiting increases in assessed values. These programs have won voter approval by margins exceeding 80 percent. He warns, “it is important to consider the broader implications of assessment limitations.”

Using 12 years of detailed property tax data for one program, Sjoquist and Pandey studied the effect of the freeze on the size of the property tax base and on property tax equity. They found that after 15 years, the freeze on homeowner property reduced the property tax base by 15 percent and shifted property taxes to other tax payers.

A concern with property taxation is that the process of determin-

**David L. Sjoquist** has published widely on topics related to state and local public finance and urban economics.

ing the value of property results in similar properties having very different taxable values. A property tax freeze institutionalizes such inequities. For example, the assessment freeze that Sjoquist and Pandey studied resulted in 35 percent of homeowners paying taxes on less than 70 percent of the actual value. On average, a home that did not sell over the 12-year period would be taxed at less than 60 percent of an equivalent home that just sold.

The reduction in taxes favors owners of high-valued homes. The benefit to owners of homes with a value between \$437,500 and \$497,500 was over 17 times the benefit to owners of homes valued at less than \$33,250. These benefits went to homeowners who are white, older and have higher income.

Based in part on this research, a July editorial in the *Atlanta Journal-Constitution* supported the idea of local governments enacting “circuit breaker” tax initiatives that “would kick in automatically to eliminate the shock of rapidly rising property tax assessments” rather than a property tax freeze. The information also played a role in a recent Georgia Superior Court case in which the property tax freeze was ruled unconstitutional.

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# convention decentralization

FUELS METRO COMPETITION

## The implications of decentralized convention facilities

- > Suburbs are competing with central cities for convention business, increasing the risks of tourism-related investments
- > Local convention and visitors bureaus and facility managers find it difficult to fill these rooms to generate the revenue needed to repay debts incurred to finance the centers
- > Local governments must be prepared to subsidize the operation of convention centers, which can challenge local budgets, even those with dedicated hotel-motel taxes

Cities of all sizes are spending economic and political capital in their rush to build convention facilities and promote tourism as an economic development strategy, according to Harvey Newman, professor of public administration and urban studies. In his latest study, "Decentralization of Atlanta's Convention Business," forthcoming in the November issue of *Urban Affairs Review*, Newman breaks new ground by examining how decentralization of the convention industry in major metropolitan areas can result in competition for meetings pitting one submarket against another, often at a cost to taxpayers who must subsidize under-performing facilities.

Much of the existing research on conventions and tourism has focused on this industry and economic development in downtowns, said Newman. As downtown land use shifted from manufacturing to services, tourism became an important strategy in the redevelopment efforts of many major cities that invested heavily in convention facilities. They compete for dollars from an industry attractive for its perceived benefits: visitors spend money without taking anything out of the local economy.

An early assumption of the convention business was that it was unlikely to relocate to the suburbs. Cities felt they could safely invest in tourist-related facilities free of local competition. Newman calls this assumption

into question with his study of how this industry in Atlanta has decentralized to a significant presence in at least four suburban counties.

Newman found that after the 1980s, cities and counties in four suburban Atlanta areas had financed convention facilities with public dollars to promote private sector development of hotels, restaurants and amusements. Convention and visitors bureaus were formed and financed with hotel/motel taxes. In each instance, a local growth coalition of business leaders and public officials formed a development authority and issued bonds to finance their area's convention facility, and often adjacent hotels, without a popular vote. The result in Atlanta was an oversupply of convention centers that must compete against each other for small-to-medium-sized meetings. Not all of the projects are winners. In fact, some do not earn enough revenue to repay the debt service on the bonds issued to finance their construction.



**Harvey Newman** specializes in economic development issues and urban policy history. He received the Franklin Garrett Award from the Atlanta Historical Society for the best article published in 2000-01 on Atlanta history for, "Decatur Street: Atlanta's African-American Paradise Lost."

A study of Atlanta's convention business may have important lessons for other urban areas that are planning such investments. "The lessons from Atlanta can also change the discussion among scholars who have described conventions as an economic activity restricted to central cities," says Newman, who warns elected officials and community leaders to consider the economic implications of the convention industry's growth into suburban jurisdictions.

"As more publicly funded facilities are built, they increase the competition for a limited

*continued on back cover*

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## NONPROFITS STUDY

## debunks privatization myths

**Since the Nixon administration, federal, state and local governments have increasingly privatized services in their efforts to improve cost effectiveness and quality.**

Proponents of service contracting, or outsourcing, insist there are cost and quality advantages in exposing public services to market competition, according to David Van Slyke, an AYSPS assistant professor of Public Administration and Urban Studies who specializes in public and nonprofit management. “Anywhere there is an alternative to government provision at comparable costs, the prevailing political and

### Social service privatization

- > Not all privatization leads to cost savings and improved service quality
- > Privatization in some cases has transferred public monopoly power and authority to private monopolists with little subsequent increases in performance and accountability
- > Governments contracting for private services should have the resources necessary to manage, oversee and enforce accountability

*“Privatization makes economic sense when there is competition and observable and measurable characteristics.”*

David Van Slyke



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economic ideology is that government should not be in that business,” he said.

Van Slyke researched whether cost savings and improved quality hold true in every service that moves from the public to the private sector (devolution). His findings say “no.” Privatization success depends on the specific types of services, the existence of highly developed and competitive markets, the specificity of the contract, and the ability to enforce accountability and evaluate program outcomes. For example, in trash collection, citizens can measure outcomes and make purchasing decisions based on price, performance and satisfaction. Social services, however, present unique challenges for public and nonprofit managers. These programs or services have goals and outcomes that are not easily defined or measured. Clients suffer from varying types of problems that range from easy to impossible to manage. They are motivated at different levels to receive treatment. Treatment timeframes can be extensive, often requiring a level of continuous care.

Social service markets are not that competitive, Van Slyke found. Barriers to competition include environmental constraints, actions by nonprofit organizations, networked relationships and government-enacted barriers. Social service outsourcing, with the movement from institutional to community care its most visible impact, was supposed to increase state and local flexibility and lead to cost savings and improved service quality. “Instead, in many cases, services were being transferred from a public monopoly to a private monopoly, with less oversight and very little political accountability,” said Van Slyke.

When Van Slyke began his doctoral program in the mid-1990s, he researched how government and nonprofit relationships in social services are structured and managed. “Social services is one of government’s largest service areas in which many citizens are both directly and indirectly affected,” he said. “What is the government’s responsibility versus services that can be privatized? How does privatization impact those receiving the services?” His findings resonate with nonprofit



David Van Slyke, Janet Johnson, and Michael Rushton

organizations, non-elected public managers and those who use these services and are impacted by the ongoing trend towards devolution.

His latest study on privatization, "The Mythology of Privatization in Contracting for Social Services," forthcoming in *Public Administration Review*, examines two questions about the privatization of social services based on research in New York state: Does social services contracting exist in a competitive environment? Do county governments have enough public management capacity to contract effectively for social services? He chose to examine New York for its longstanding system of social policy supports, its extensive use of contracting with nonprofits for service delivery, and because its counties are mandated to provide services for the needy in equal proportion to the state.

"Privatization makes economic sense when there is competition and observable and measurable characteristics," said Van Slyke, who found that in certain cases, and in particular locations, privatization takes place for reasons other than the benefits normally associated with competition. Privatization and contracting for social services with nonprofit providers is often used for politically symbolic reasons: to demonstrate that government is getting smaller, that it is working more efficiently by disengaging itself from direct service delivery, and that it is not encroaching on private markets. The act of privatization was found to be more political than economic.

The lack of competition and subsequent reduction in public administration capacity also poses significant material challenges when contracting for these services. "We need more, better qualified managers to monitor this contracting activity. But when budgets take a hit, governments cannot hire or retain the personnel to do the job," said Van Slyke. Government agencies do want to make these corrections, but are often constrained by their resources. "Non-elected managers face the scrutiny of elected officials who make budget decisions." As governments reduce their capacity to monitor and evaluate outsourced social services programs, opportunities for fraud and abuse rise.

If government is to contract for social services in the private market, it must have the resources necessary to manage, oversee and enforce accountability. To avoid the pitfalls of privatization, government must take a long-term outlook and invest in contract management. Van Slyke calls for more empirical research to examine the public management implications of contracting with nonprofit organizations beyond the rhetoric of privatization. His aim is to help advance theories about public management, practices and tools used in privatization arrangements.

**About nonprofit research at AYSPS** The school's focus in nonprofit research follows two tracks: privatization and philanthropy. The focus in privatization is on the relationship between government and nonprofit organizations in social services delivery, and examines the public and nonprofit management implications. Its research on philanthropy for nonprofits is the first in the area that is locally based. It is driving decision-making by the local nonprofit community. "Grant makers and practitioners at the United Way and the Community Foundation are implementing our findings locally. Smaller and medium-sized nonprofits are using it to make programming decisions," said Van Slyke.

The AYSPS Nonprofit Studies research stands out in many areas. "We look into issues of management and policy, not one or the other exclusively. And our emphasis on the intersection of nonprofits with government, for-profits and faith-based organizations is real and concrete. Also exciting is the growing number of students who are coming into our program to study nonprofits and philanthropy."

Van Slyke said he used a triangulation method in researching his latest privatization piece, conducting a series of interviews, holding focus groups and gathering quantitative data to achieve greater reliability and validity in his findings. Triangulation gives one the ability to generalize, he explained, noting that this method allows greater confidence in the findings. "The broader the reach, the less room there is to hide an agenda."

Van Slyke credits AYSPS Advisory Board member Mike Mescon's leadership and vision and Alicia Philipp, Advisory Board member and president of the Community Foundation for Greater Atlanta, for getting the program launched. Janet Johnson, adjunct professor at AYSPS, is a major contributor to the program with research focusing on compensation of nonprofit sector employees and the economic determinants of giving. Departmental colleagues Sally Fowler and Chris Horne, a doctoral student in the public policy program, are adding to the school's growing body of research in the nonprofit community and philanthropy. Michael Rushton, an associate professor, recently joined the faculty; his specialty is the governance of nonprofit organizations. Van Slyke works with Sarah L. Eschholz, a professor in Georgia State's criminal justice program, on research in philanthropic and related areas. "Why Do People Give?" was co-authored by Arthur C. Brooks, a former AYSPS assistant professor.

## WHY DO PEOPLE GIVE?

# new evidence, new strategies

Growing demand for services is pushing nonprofit agency budgets to new levels. Nonprofit managers are paying more attention to the charitable contributions of individuals – an organization’s largest source of “unearned” income – as they work harder to develop their human and financial resources. AYSPS-led research is uncovering new evidence on what motivates people to give.

In the study, “Why Do People Give? New Evidence and Strategies for Nonprofit and Public Managers,” Van Slyke and former AYSPS professor Arthur Brooks illuminate which giving strategies work with what types of people by connecting existing research on demographic patterns of giving to information on specific, successful fundraising strategies. His team used a scientifically designed, extensive survey of residents in metropolitan Atlanta to estimate the impacts of socio-demographic and economic characteristics on the success of different donor development approaches. Sophisticated modeling built on previous research provided a comprehensive empirical analysis of who gives to what nonprofit, why they give, how much they give, and what would cause a group to give more.

The result was a set of management implications that will assist nonprofit managers in crafting development strategies for their orga-

### likelihood to give | BASED ON % RESPONDING YES



### Why do people give?

- > Donors can be demographically segmented in terms of the success of certain fundraising strategies
- > Positive determinants of charitable giving are age, religious identity, Bachelor's degree or equivalent, civic and charitable activities, and volunteering in nonprofit organizations
- > Donor segments respond differently to fundraising focuses on community, nonprofit effectiveness, sense of duty, help in times of need, tax benefits and religious reasons

nizations. These new tools can be used for advising the nonprofits they manage and oversee, and can remove the impediments of mission drift, goal divergence and resource dependency that often stall their resource development efforts. “The data can be used in robust ways to assist nonprofit and public managers in targeting new sources of human and financial capital,” wrote Van Slyke.

He suggested that future research can build in these methods and findings as researchers seek to develop more detailed vectors of fundraising strategies for donors and volunteers tied to specific types of activities. Since the release of this study, Van Slyke and colleagues have produced a number of related research pieces, including “New Evidence about Women and Philanthropy: Findings from Metro Atlanta,” with Sarah L. Eschholz, commissioned by the United Way of Metropolitan Atlanta Women’s Legacy Project; and “To Give, To Volunteer, To Trust: How Strong is the Philanthropic and Civic Tradition in Metro Atlanta?” with Janet L. Johnson, commissioned by The Community Foundation for Greater Atlanta.

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## DEVELOPING

## performance measures

**Guidelines for developing adjusted performance measures**

- > Include as many uncontrollable factors as possible – including historical performance of the organization's clients
- > Include as many controllable factors as possible
- > Do not overemphasize single outcome measures; create multiple APMs for each organization and use in combination with other performance measures
- > Use APMs to identify outliers, or exceptionally high or low performers, rather than to rank organizations; small differences in adjusted performance are not generally significant
- > Obtain better data and consider more sophisticated methods to improve the quality and usefulness of APMs, while still considering the trade-off between sophistication and transparency
- > Do not neglect the idea of adjusting performance measures when only a few organizations can be used for comparisons

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“Holding public organizations accountable for their performance has become an important tool for improving the efficiency of service delivery in the public sector, and is especially true in education,” says Ross Rubenstein, assistant professor of public administration at the Andrew Young School. “For example, the success of Georgia’s recent education reforms and the federal government’s ‘No Child Left Behind’ act is predicated on the ability to measure school performance.”

Despite the popularity of educational reform efforts, there has been little consensus among researchers, educators and voters on the most valid and reliable methods to assess performance, Rubenstein notes. “The nation’s public educational system is made up of schools with varying levels and quality of resources. Students come from a wide variety of backgrounds and bring to their environment a broad range of abilities and attitudes about learning. A myriad of methodological and conceptual problems have plagued most efforts to accurately compare the performance of these very different schools and their diverse populations.”

Rubenstein is fast developing a reputation as a leading national scholar in the field of education policy. His paper with professors Leanna Stiefel and Amy Ellen Schwartz of New York University, “Using Adjusted Performance Measures for Evaluating Resource Use,” won

the 1999 Joseph Wholey Distinguished Scholarship Award. His newest research is taking education performance measures to the next level. He, Stiefel and Schwartz were awarded a \$650,000 grant from the U.S. Department of Education to expand on their research in a study called, “Good Schools, Good Students? Measuring School Performance with Diverse Students.”

“This research will thoroughly study the issues in measuring organizational performance in education. It will offer new insight into the best ways to accurately measure performance when comparing schools that must work with students under very different conditions,” said Rubenstein. It will investigate and develop the best available methods of measuring school performance, using quantitative and qualitative techniques and both school-level and pupil-level data, and identify factors that contribute to high performance. A unique student-level database from New York City will allow the researchers to track student performance over time and link performance to differences in school resources and spending patterns.

Data on public schools in New York City and Ohio were chosen to identify methods for measuring school performance for students who vary considerably in their language skills, prior academic experience and socioeconomic backgrounds. “The wide range of backgrounds of New York’s 1.1 million students provides an unsurpassed opportunity to investigate performance in urban schools serving diverse populations,” Stiefel explained. “Ohio’s school districts span this range of diversity; yet also represent the more ‘typical’ school districts across the country.”

Now one year into their three-year project, their early findings suggest that useful performance measures must take into account each school’s educational environment. In “Better Than Raw: A Guide to Measuring Organizational Performance with Adjusted Performance Measures,” the team found raw performance measures – such as test scores or success rates – often inferior to performance measures that had been adjusted for client and environmental characteristics. For example, with the strong relationship between student socio-economic background and test scores, simply ranking schools based on student scores would closely reflect a ranking based on family income. An adjusted performance measure allows for comparisons of school performance that attempt to control for measurable differences in the mix of students served by each school.

In this second report they used examples from a number of public agencies and data on Georgia’s public schools to compare perfor-

# for schools

**Ross H. Rubenstein** holds a joint appointment in the College of Education at Georgia State University. He was recently announced the 2002 recipient of the Miriam Mills Award from the Policy Studies Organization as “outstanding young person in the field of policy studies.” Amy Ellen Schwartz is an associate professor of public policy at the Robert F. Wagner Graduate School of Public Service at New York University. Leanna Stiefel is a professor of economics at the Robert F. Wagner Graduate School and past president of the American Education Finance Association.



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mance data generated by raw scores and adjusted measures. They concluded with guidance for constructing and using adjusted performance measures. For example, they caution managers not to become overly focused on a single measure of performance, and they describe the ways in which environmental factors outside the control of managers should be distinguished from those within their control.

“Performance measures are being used to define adequate achievement for state school finance formulas; to make decisions about staffing (allocating teachers, hiring and firing principals and superintendents); to make decisions about closing or re-constituting schools; to award bonuses to school staff; to define eligibility for school vouchers; and to decide about summer school attendance and promotion,” said Rubenstein, Stiefel and Schwartz in the report. “With such high stakes attached to them, it is important that these measures accurately and usefully reflect ‘performance,’ rather than merely the characteristics of the students and the resources of the school. Ultimately, we believe our study will offer a number of significant advances in the measurement of school performance and the use of those measures for allocating resources and improving performance.”

Rubenstein said that he, Stiefel and Schwartz feel that because this analysis holds such great promise for improving accountability, bud-

geting, incentive programs and resource allocation decisions in an organizational structure that serves a diverse population with distinct needs, these findings will apply to many public service organizations outside of education.

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## GAY RIGHTS LEGISLATION:

# who shapes policy?

Public opinion polls show strong popular support for equal employment rights for lesbians and gay men, but only a dozen states have outlawed employment discrimination on the basis of sexual orientation. Why haven't more states passed legislation, when previous research shows that government policies are strongly linked to public opinion, even on issues that attract far less public interest? Although one important study concluded that the size and wealth of gay rights groups and the level of support among the political elite matter more than public opinion in passing protections against anti-gay discrimination,

## Public opinion and gay right legislation

- > Previous research had assumed that gay-supportive communities were the most likely to pass gay rights legislation, but these studies never adequately measured public support
- > Public acceptance of gay teachers is the strongest predictor of gay rights protections
- > To be successful in gaining the adoption of anti-discriminatory legislation, activists must lobby the general public as well as legislatures



**Gregory B. Lewis** specializes in research on career patterns in the federal civil service and the impact of race and sex on salaries, promotions, turnover rates and on other conditions of employment. He has presented earlier versions of this paper to two annual meetings of the American Political Science Association.

Gregory B. Lewis, AYSPS professor of public administration and urban studies, found that good measures of public opinion suggest that the public gets what it wants on gay rights.

In his paper, "Public Opinion and State Gay Rights Laws," Lewis combines 35 national surveys with 50,000 respondents to develop empirical, state-level measures of public acceptance of lesbian and gay teachers. He argues that opposition to homosexuals in the classroom is a key stumbling block to passing gay rights legislation. "Only in the mid-1990s did a majority of the American public begin telling pollsters that they favored hiring homosexuals as elementary school teachers, and that probably overstates public acceptance," he argues. "Until a majority are willing to have their children taught by lesbian and gay teachers, opponents of gay rights laws have a winning argument."

Lewis's findings show that public opinion does drive the passage of state laws protecting these rights, even when the issue does not go to the ballot box. The 13 states that have passed gay rights laws are among the 16 states where acceptance of lesbian and gay teachers is

highest. Only states in which more than 60 percent of the population accepts homosexual teachers have enacted gay rights laws. Apparently these laws need super-majority support.

Lewis tested alternative explanations for the passage of gay rights laws. "Public acceptance of homosexuals as teachers proved to be a stronger predictor of state gay rights laws than an interest group politics model, state liberalism, or political tolerance or public attitudes toward homosexual sex," he found. The results of this work carry important implications. Public opinion matters greatly. These findings suggest that gay rights advocates must target the general public as well as legislatures. "Although lobbying political elites is important at the margins, the

battle really does appear to be for the hearts and minds of the American public... A gay rights political strategy needs to make convincing the public as important as lobbying legislatures," said Lewis.

## [ RELATED READING ]

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## ECONOMICS OF SCIENCE:

informing  
national  
discussion

Paula Stephan, professor of economics

**Just what can a social scientist teach the hard science and engineering community?**

She can teach it quite a lot about its critical labor dynamics and trends if that social scientist is Paula Stephan, a professor of economics at the Andrew Young School. Since 1983, Stephan has analyzed labor data on scientists and engineers. She has published several seminal articles, including “The Economics of Science,” in the *Journal of Economic Literature*, September 1996, and as a result is one of a handful of social scientists regularly invited to serve on national committees examining labor trends in these fields.

Along with other current projects, Stephan is an active participant in the National Bureau of Economic Research (NBER) Scientific Workforce project, directed by Richard Freeman, holder of the Herbert Ascherman Chair in Economics at Harvard University and director of the labor studies program at NBER. “I know Paula and her work very well,” said Freeman. “Whereas most labor economists have focused on poverty, minimum wage and related problems associated with the low-skill labor market, Paula is unique in working on the science and engineering high-skill market. She has done fundamentally important analyses of this market and is one of the few economists whose work has gained the attention of the science policy community.

“In a word, Paula is a star in this area – the type of scholar that comes to everyone’s mind when they think of the economics of science. I am happy she is working with the NBER on an upcoming project,” said Freeman.

Stephan traces her interest in the science community back to the late 1970s. “A lot of science and engineering labor market data has

been collected since 1973,” said Stephan, “but only a limited number of people were familiar with it.” In 1979 Alan Fechter, a fellow economist at the National Science Foundation, pointed out his concern that the United States science and engineering workforce was aging. “The median age was rising. The Vietnam War had marked the slowing down of U.S. funding for science; the country was not hiring,” she said.

“Embedded within the hard sciences is the belief that science is a young person’s game – Fechter’s fear was that an aging workforce would have serious consequences for this country,” continued Stephan. “Although my early work was not related to science and engineering, I became interested in this area after Fechter suggested that the people studying it up to that time did not engage in economic modeling – their findings were based largely on anecdotal evidence and cross tabulations.” She began working with this data in 1983.

In 1992 Stephan and co-author Sharon Levin published their first work on this area, “Striking the Mother Lode in Science: The Importance of Age, Place, and Time.” (Oxford University Press.) They published a companion article in the *American Economic Review*, the premier journal in economics for which Stephan has since been called to referee.

Stephan is recognized as one of the nation’s top economists in science and engineering, and is often called on to study rapidly changing labor trends in a number of related areas. She credits her unique position as the rare economist working among legions of scientists, immersed in their attitudes and issues, for giving her a firm understanding of this field and of questions that call for further study. “It gives me a stronger feeling for trends.”

In describing her work with Stephan, Levin says, “I think Paula has an uncanny ability to see the forest from the trees. She can interpret the most technical of analyses and write about them in a way that is intelligible to the educated reader. She has been most successful in bridging the gap between the data specialists and policymakers concerned with the scientific workforce.”

In her earliest research, Stephan suggested that economists rethink the way they study the careers of scientists and their particular human capital issues including demographic and stage-of-life effects on earnings, research productivity and receptivity to new ideas. Her findings continue to build on these areas. Her three latest research tracks encompass bioinformatics, the immigration of talent, and performance measurements for government programs.

*Bioinformatics is getting a lot of attention and there is a shortage of specialists. Our goal was to find out why universities were slow to address this need.*

Paula Stephan

**About Paula E. Stephan** Stephan's interest in the economics of science follows four basic streams of research: issues related to productivity, the foreign-born, how knowledge moves from the university sector to firms and its economic impact, and the recruitment and retention of women and minorities into the science and engineering workforce. Her work in these areas has made her a major user of data on scientists and engineers collected by the NSF, and she sits on one of this institution's advisory panels.

Stephan frequently fields requests to speak on issues related to the scientific workforce, with recent presentations made before the presidents of the American Association of Universities and the Wellcome Trust's Career Issues in U.K. Academic Research conference. She has served on a number of National Research Council committees.

The institutions that Stephan most often interacts with include the NBER Scientific Workforce Network, the NBER Higher Education Study Group, the NRC (a research arm of the National Academy of Sciences) and various committees of the National Science Foundation. She feels it is a great honor to work among these groups. Recent funding has come from the NSF and the Alfred P. Sloan and Andrew W. Mellon foundations.

Stephan works closely with Grant Black, who received his Ph.D. from the Andrew Young School in 2001 and is now a senior research associate in the school. She is currently working on a study of patenting in collaboration with Black, A.J. Sumell, an AYSPS graduate student, and Shiferaw Gurmu, associate professor of economics at AYSPS. She continues to work with Sharon G. Levin, a professor of economics at the University of Missouri-St. Louis, with Levin's colleague, Anne Winkler, and on another project with economics professor James D. Adams of the University of Florida.

### **"Bioinformatics: Does the U.S. System Lead to Missed Opportunities in Emerging Fields?"**

In this case study, published in *Science and Public Policy*, December 1999, Stephan and Grant Black address the difficulties that universities have found in developing programs in bioinformatics, a field that was nonexistent 20 years ago. Their purpose was to find "why universities appear slow to start programs in bioinformatics... and whether changes are needed in the incentive structure to encourage institutions to be more responsive to changing opportunities in the future."

### **University resources lag for bioinformatics**

- > Size and direction of Ph.D. programs in life sciences respond to research funding; not to jobs in industry
- > Post doctorate position vacancies distort true nature of the job market in the life sciences
- > Life scientists often lack quantitative skills to work in bioinformatics
- > Field requires cross-discipline cooperation that current structure discourages

"In the life sciences there are billions of bits of data emerging with the mapping of the human genome and the race to find gene-based treatments for diseases. Against this tide of discovery, only a small number of scientists have developed the combination of computer science, math and molecular biology skills needed to analyze this data," said Stephan. "It is a rapidly changing field with only a few hundred scientists specializing in bioinformatics. This field is getting a lot of attention and there is a shortage of specialists. Our goal was to find out why universities were slow to address this need."

Does the structure of the U.S. science enterprise lead to missed opportunities in emerging fields, particularly when the demand is heavily centered in industry? In this study, Stephan and Black found four interrelated reasons that university response to developing programs in bioinformatics skills is sluggish, despite the demand.

- There is a lack of incentives for faculty to establish such highly specialized programs.
- The size and direction of Ph.D. programs in the life sciences are more responsive to signals embedded in funding opportunities for faculty research than to those provided by the job market for graduates.
- The interdisciplinary nature of the field requires cooperation across disciplines, while the bureaucracy and incentive structures of most universities act to discourage such collaborative efforts.
- There is no "quick fix" or economic incentive that will encourage computer scientists to acquire additional training in biology, and many life scientists lack the math training and inclination to become successful computational biologists.

These findings highlight the contrast of market demand and a lack of public incentives. They can be extended to the issue of training specialists in any number of emerging scientific fields. "It all comes

back to the economics of higher education,” said Stephan. “For all the reasons we identify, it is a real challenge to make interdisciplinary programs work at the academic institution level: training may cross academic units and finding funding is difficult, yet faculty research is guided by its funding sources.” But she also offers hope.

“Lately we’re seeing a change in where the research dollars are going. NSF funding is a good example – they are putting more money into interdisciplinary programs. As a result, institutions are becoming more interested in building interdisciplinary programs.”

### Exceptional contributions to U.S. science by the foreign-born and -educated

The dot.com boom, its bust and changes in foreign policy in response to the September 11 attacks have directed a lot of attention to U.S. immigration policy. With her study of the contributions of highly skilled immigrants in science and engineering, co-authored by Sharon Levin and published in *Population Research and Policy Review*, (20: 59-79, 2001), Stephan brings hard data and thoughtful analysis to another national policy debate which was in danger of being decided by anecdote.

### The role of immigrant scientists and engineers

- > Immigrants contribute disproportionately to U.S. science
- > U.S. benefits from educational investments made by other countries
- > U.S. is not attracting its best and brightest students into science and engineering
- > Citizen doctorate holders have been displaced from jobs by immigrants
- > Growth in U.S. Ph.D. production is due largely to increase in students coming from abroad

“This paper and work we’ve done on graduate students studying on temporary visas got a lot of attention,” said Stephan. “We’re still fielding media calls on the international student issue.” One of the first economists to bring hard evidence to the analysis of science and engineering labor immigration issues, Stephan in this study uses six indicators of scientific achievement to examine whether the foreign-born and foreign-educated are disproportionately represented among the scientists and engineers making exceptional

contributions to their fields.

An analysis of these metrics found that although there was some variation by discipline, a disproportionate number of foreign-born and foreign-educated individuals are making exceptional contributions in these areas in the U.S. Stephan and Levin concluded that immigrants have been a source of strength and vitality for U.S. science, and that the U.S. appears to have benefited from the educational investments made by other countries. “We get a lot of calls from institutions in Europe,” said Stephan. “They are concerned about the brain drain from their countries. Here a number of policy groups are thinking about limiting immigration. From the U.S. perspective, we need to be aware of its benefits.”

Stephan and Levin received a follow-up grant from the Alfred P. Sloan Foundation, which funded the original study, to look into issues of displacement. Are U.S. scientists and engineers bearing the cost of the inflow of foreign talent by being displaced from jobs or by earning lower wages? Said Stephan, “Largely because of the inflow of foreign talent, Ph.D. production in the U.S. has increased significantly. U.S. students are not going into these fields. People are concerned that we’re not attracting our best and brightest into science and engineering.” Their latest work, a joint study with Anne E. Winkler and Grant Black, presents evidence that citizen doctorate-holders in science and engineering have been displaced from jobs by immigrants who have received their doctoral training in the United States. This is especially true in academe.

### Performance Measurement: Science and Technology

Stephan’s study of issues related to productivity in science and engineering has captured the attention of the federal government. In May, 2002, she was invited to make a presentation on performance metrics to a workshop hosted by the NSF in conjunction with the President’s Management Council and the Office of Management and Budget.

“The Bush White House is interested in relating agency budgets to performance,” said Stephan. “They are looking for real ways to measure government performance.”

In this paper, Stephan presents the four goals of federally funded programs sponsoring research and the aspects of these goals that can be measured. She identifies metrics that are important for their contribution to accurate assessments, in serving as a measure of scientific



# war on terrorism

contribution that relies on peer review and in having established links to economic outcomes. She also asserts the role of qualitative studies that are necessary to capture the unique aspects of federal programs that quantitative studies will miss.

Stephan is frequently called upon to help inform public discussion when the topic is the economics of science. Her goal, like that in science, is discovery – but rather than test-tubes and circuits, her tools are the metrics that relate to economic performance.

“Science is key to growth in our economy,” said Stephan. “Is our science community the right size? Is it offering the best opportunities? Are we funding it in the right way? How, exactly, does science impact the economy? A lot of people speculate about trends, but they often don’t have the numbers to substantiate their speculations. We provide that.”

## Considerations in developing an anti-terrorism policy

- > A top-down, command-and-control approach, such as the proposed new Department of Homeland Security, may be counterproductive because it undercuts state and local governments’ capacities to respond to and manage the many common emergencies that are more likely to happen
- > The current network of emergency response organizations is highly effective in coordinating disaster responses, mitigating hazards and improving preparedness for future violence

In a speech on July 16, 2002, President George W. Bush released his “National Strategy for Homeland Security.” At stake is \$37.4 billion requested in fiscal year 2003 to create his proposed Department of Homeland Security, a new Cabinet department that will bring together an estimated 170,000 employees from 22 federal agencies.

Bill Waugh and his co-author Richard Sylves in “Organizing the War on Terrorism,” forthcoming in *Public Administration Review*, ask whether this effort will prove as effective as the existing emergency response structure. Their questions are important to policymakers involved in developing homeland security: “Are the latest investments in programs developed to reduce the hazard of terrorism changing national, state and local policy priorities, and if so, is it for the better? Will the new emphasis on counterterrorism complement or undercut state and local governments’ capacities to manage the many common hazards to which they must respond?”

Waugh and Sylves argue that today’s emergency response organizations, along with national security and law enforcement agencies, have evolved a network management structure highly effective in coordinating the response to natural and man-made disasters. “This network,” says Waugh, “provides a foundation for the war on terrorism, helps to mitigate such hazards and improves preparedness for future violence.” He warns that “an organization with a top-down, command-and-control approach to the war on terrorism may be counterproductive.”

Their research addresses how the federal government should organize its war on terrorism and lessons learned from organizations like the Federal Emergency Management Agency that currently respond

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# strains emergency management



to national emergencies. They describe how the existing system deals with hazards including terrorism, the new counterterrorism structures that are part of the “Defense of the Homeland” programs, and the poor fit between the new structures proposed and the existing national emergency management system. They conclude by examining the policy implications of the current war on terrorism.

Waugh, a participant in the Partnership for Public Warning’s Workshop on the Homeland Security Advisory System, said the partnership’s findings have been well received at the Office of Homeland Security, the interim agency created in response to the attacks on September 11. In July he sent a letter to Georgia’s congressional delegation outlining their findings that contradict the president’s proposal to create a new, centralized department to fight terrorism. “The major message is that I don’t think much of the president’s proposal,” said Waugh. His letter asked the delegation to challenge this proposal as it relates to five important issues and those embedded within them, including the decision-making process and the role of political leadership.

Waugh further elaborated on the poor history of creating federal agencies by grouping disparate programs, this plan’s compromise of FEMA’s response to natural and man-made disasters, its lack of hazard mitigation programs to prevent or reduce the likelihood of human and property losses, its ineffectiveness in having one mission focus on a common view of terrorism and a common set of problems, and the limits that would be imposed with a closed, bureaucratic system that does not reflect the values that underlie current governance practices.

**William L. Waugh, Jr.** teaches public administration. His research focuses on the design of disaster policies and hazard-reduction programs and on the coordination of multi-organizational and intergovernmental operations. Since September 11, Waugh has responded to more than 200 media interviews and has spoken at national roundtables and on college campuses on these topics. He is lead developer on his second course on terrorism for FEMA’s Higher Education project. Richard T. Sylves teaches in the Department of Political Science and International Relations at the University of Delaware.

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# strategic apportionment

A FIX FOR CORPORATE TAX POLICY?

*continued from page 7*

state legislatures – are much greater in magnitude than are the economic development impacts. Revenue consequences tend to be felt immediately, while economic development benefits are longer term. Again, if Georgia were to impose a single-factor sales formula, the effects on corporate tax collections (which would be negative in Georgia's case) would be immediate, while the (positive) effects on production would be longer term.

These findings have been used by the Governor's Office and by business leaders considering the pros and cons of using this formula to tax corporations in Georgia. They add to the ongoing debate about the effectiveness of these policies in stimulating development and revenue consequences.

# convention decentralization

FUELS METRO COMPETITION

*continued from page 12*

number of meetings and place tremendous stress on localities to fill hotel rooms and generate the revenues needed to repay their financing debt. In some instances, the expense of building and managing convention facilities, when subsidized by local governments, may create voter backlash against the elected officials who supported their development," he said.

Newman hopes to change the discussion among scholars who have described conventions as an economic activity restricted to downtowns. "Scholars and practitioners in other metropolitan areas can learn from Atlanta's experiences in building a decentralized convention industry."

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