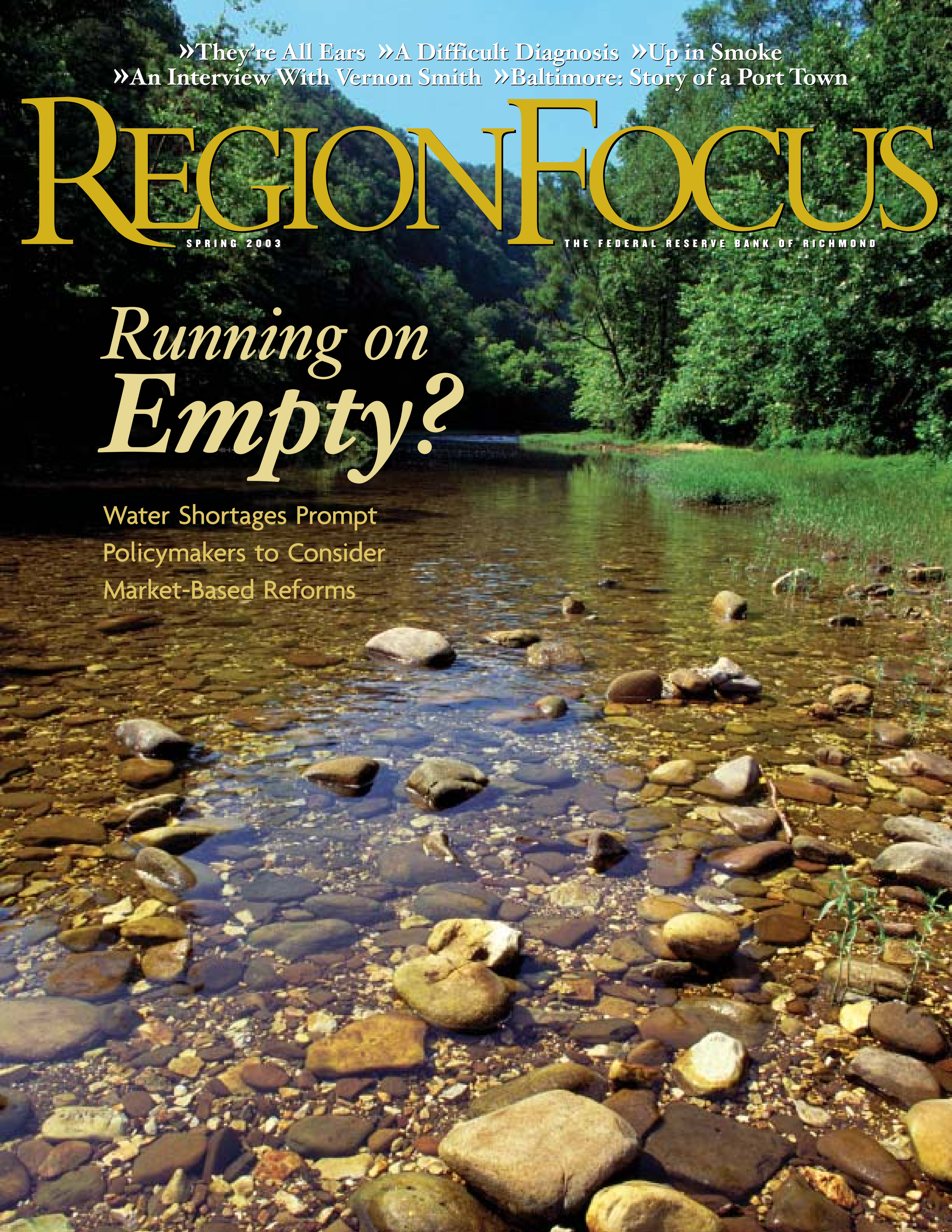

»They're All Ears »A Difficult Diagnosis »Up in Smoke
»An Interview With Vernon Smith »Baltimore: Story of a Port Town

REGION FOCUS

SPRING 2003

THE FEDERAL RESERVE BANK OF RICHMOND

Running on Empty?

Water Shortages Prompt Policymakers to Consider Market-Based Reforms

AP PHOTO/RICKY CARIOTI

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COVER STORY

FEATURES

DEPARTMENTS

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Our mission is to provide authoritative information and analysis about the Fifth Federal Reserve District economy and the Federal Reserve System. The Fifth District consists of the District of Columbia, Maryland, North Carolina, South Carolina, Virginia, and most of West Virginia. The material appearing in *Region Focus* is collected and developed by the Research Department of the Federal Reserve Bank of Richmond.

DIRECTOR OF RESEARCH
Jeffrey M. Lacker

SENIOR EDITOR
Aaron Steelman

MANAGING EDITOR
Rowena Johnson

BUSINESS WRITERS
Charles Gerena
Betty Joyce Nash

PRODUCTION ASSISTANT
Bridgette Craney

CONTRIBUTORS
Elaine Mandaleris
Christian Pascasio
Karl Rhodes
Roy Webb

ECONOMICS ADVISERS
Andrea Holland
Robert Lacy
Ray Owens
John Weinberg

CIRCULATION
Joyce Eberly
Nichole Richardson

DESIGN
AURAS Design/
Maureen Gregory

Published quarterly by
the Federal Reserve Bank
of Richmond
P.O. Box 27622
Richmond, VA 23261
Phone: (804) 697-8000
Fax: (804) 697-8287
E-mail: rich.regionfocus@rich.frb.org

www.rich.frb.org/pubs/regionfocus

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Water Rights

Price systems can work for difficult allocation problems, including cases in which the government seeks to allocate some resource for private use.

In the early chapters of an introductory economics textbook, one is likely to find a reference to something called the "diamond-water paradox," meant to demonstrate the difference between economic value and other notions we might have of the relative importance of different commodities. Can the price of something be a good measure of its inherent worth if water, something essential to life, bears a miniscule price compared to diamonds, something with merely ornamental uses? A moment's reflection, however, reveals that there is no real paradox here. The difference derives from the abundance of water and the scarcity of diamonds. In fact, water historically has been so plentiful that it typically has not been treated as an economic commodity subject to the laws of supply and demand. Surely, if there were rivers and lakes of diamonds, they would be just as cheap — and engagements might be marked in a very different way.

What happens when water's abundance begins to recede? This issue of *Region Focus* features a story on the growing challenges facing Fifth District communities and public utilities as expanding populations squeeze the ability of ground and surface water resources to quench the growing thirst. Latent problems with traditional approaches to water allocation have risen to the surface during the recent drought.

Frequent readers of this column will not be surprised if I suggest that market-based approaches to water allocation problems deserve serious consideration. At one level, water seems very much like a standard economic commodity suitable for allocation guided by market prices. Measuring an individual's or a business' use of water does not pose significant difficulties. Why then shouldn't users pay a price that reflects the full social costs of their use? Usage may not be very sensitive to price in the short run, but higher prices would surely make individuals more willing to consider longer-term changes in behavior or the purchase of water-saving devices.

Of course, the technology of water delivery may make this a market that is not well suited to competition. A system for carrying water has some of the characteristics of a natural monopoly, since a competing system would have to duplicate the costs of building an infrastructure. Such duplication is usually wasteful from a social point of view. Markets with natural monopoly characteristics are often subject to government regulation to prevent a monopolist provider from extracting excess profits.

There may also be political constraints that limit our ability to treat water as a standard economic commodity. Pricing water use at full social cost may simply not be a politically acceptable option, given that it would represent a substantial departure from the traditional approach, in which users pay at most for the resource costs of water treatment and distribution. As water becomes more scarce, the opportunity cost associated with alternative uses rises. Standard public utility pricing of water does not take such costs into account.

So setting prices for water may not be an easy task. Still, price systems can work for more difficult allocation problems as well, including cases in which the government seeks to allocate some resource for private use. In fact, the laboratory experiments of Nobel Prize economist Vernon Smith, the subject of this issue's Interview, have deepened our understanding of such allocation questions. For example, his work on the design of institutions for the allocation of airport landing rights showed how the careful design of market institutions can align private incentives with social objectives. Now I'm not suggesting that Professor Smith begin conducting experiments aimed at solving water allocation problems. His work proves, however, that the interplay between academic research and public policy problems can yield creative approaches to difficult questions concerning the allocation problems that local, state, and even national governments sometimes face. I don't expect this flow of benefits to dry up any time soon.

Al Broaddus

AL BROADDUS
PRESIDENT
FEDERAL RESERVE BANK OF RICHMOND

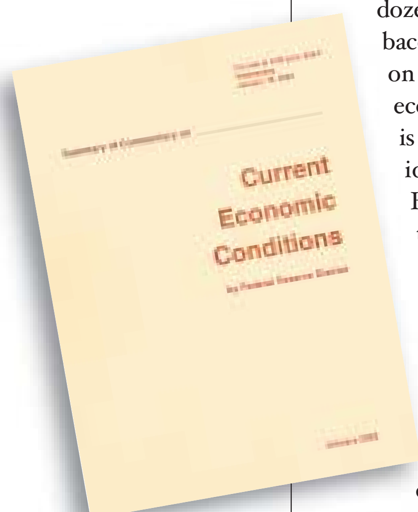
They're All Ears

The Richmond Fed's Regional Economics Team Listens Carefully to the District's Economic Heartbeat

BY BETTY JOYCE NASH

"An old woman who was getting up in years went to the doctor. After running a battery of tests, the doctor came back and told her that, unfortunately, she had perhaps six months to live. Naturally, she was distraught. After thinking about it a few moments, she asked her doctor what she should do. 'I suggest you marry an economist and move to North Dakota,' the doctor said. The woman was a bit baffled ... She asked, 'How will that make me better?' 'It won't, but it'll make your remaining time seem like an eternity.' "

Hoots of laughter fill a meeting room, proving that even at this early hour — 7:30 a.m. — the members of the Construction Financial Management Association are wide awake. Several dozen people have gathered over bacon and eggs to hear the latest on the regional and national economy. The featured speaker is Raymond Owens, a vice president of the Federal Reserve Bank of Richmond, who told the above joke to disarm the crowd and poke gentle fun at his own profession.



The "Beige Book" is published two weeks before each Federal Open Market Committee meeting.

Keeping a good joke at the ready is a big part of Owens' job. He travels throughout the Fifth District to discuss economic conditions at various gatherings, as many as 60 in a year. Those economics gigs run two ways, though, Owens says. He gets as good as he gives.

"Not only do you show up and talk about the national economic condition, but you also meet and greet and talk to people," he says. "You learn about the local economy. You get more insight than you ever could by sitting here reading reports."

True. Before the talk even starts, the group launches a roundtable discussion about the difficulty of finding construction workers and various incentives to lure them. That's information Owens stores and ponders later in the office. "Why 90 days?" he wonders aloud at the set time a new employee must stay for a referral to be rewarded. It could be a question he'll use in personal interviews to collect anecdotal information about the Fifth District economy.

Owens and six colleagues in the regional economics group of the Richmond Fed analyze plenty of data. In 2002, they put out 128 separate verbal and written reports and articles. The researchers also produce massive reports on the Richmond Fed's Web site, including a new monthly publication, "5E Economic Indicators," that tracks the District's most recent activity.

Regional group members Robert Lacy and Andrea Holland also contribute a regular section on the District economy to *Region Focus*.

Some of the timeliest information the regional group gathers, though, isn't online or on paper — it flows from the people they meet and talk to on the telephone. These snapshots of the Fifth Federal Reserve District are ultimately folded into the "Summary of Commentary on Current Economic Conditions," more commonly known as the "Beige Book." It's published two weeks before each Federal Open Market Committee (FOMC) meeting. The regional group uses the District information gathered for the book to prepare briefings for the Bank president as part of the FOMC cycle (see the Summer 2002 issue of *Region Focus* for more on the FOMC). Owens and his group also contribute additional research on topics requested by the Board of Governors.

"When there are issues thought to be important to the national economy, we are asked to provide special reports to the FOMC," he says. "Let's say there's a big natural disaster — a hurricane or 9/11 — we'll often compile information on the impact on businesses and households."

The Fifth District section of the Beige Book is a current overview of retail, services, manufacturing, finance, real estate, tourism, temporary employment agencies, and agriculture.

Each Federal Reserve Bank contributes summaries noting anecdotal information about its region's economic sectors. Have orders expanded for manufacturers? What is the residential and commercial real estate market like? Are firms planning to hire or fire? How about inventories? The book in its entirety, then, becomes an instant picture of the national economy. "To understand the Beige Book, you have to understand what you hope to get out of it," Owens says. "There's this idea that regional economic information is important. It [the Beige Book] captures information that isn't captured in a timely fashion [by traditional numerical measures]. The theory is that those numbers are missing important information that can be useful. The economy is dynamic, fluid. You don't want to diminish the value of those economic numbers, but they don't tell the whole story. One way to fill in those missing parts is with timely, detailed information at the regional level."

Interviews with sources in each sector contribute to insights about the economy. The monthly manufacturing and retail/services surveys, nearly 10 years old in their present form, offer a wealth of data, especially when fleshed out with personal interviews, say Judy Cox and Aileen Watson, assistant economists in the regional unit. The surveys, intended for up-to-the-minute

LARRY CAIN/FRB OF RICHMOND

Raymond Owens, a vice president at the Richmond Fed, travels throughout the Fifth District to discuss economic conditions. Talking and listening to the people he meets on these trips provide valuable insights into the local economy.

internal briefings for Richmond Fed economists, are released on the second Tuesday of each month. Cox and Watson often follow up survey responses with telephone calls or e-mails to glean more information. The personal interviews, Owens observes, add depth to the data.

"Government enumerators have a set of questions," Owens says. "Those might be important, but they might not [be the right questions]. If you're having a personal conversation with someone, they'll tell you what's on their mind." In working the Fifth District over the past 20 years, Owens has picked up tidbits that inform his analysis of economic conditions. For instance, in a conversation with a fellow from Wilmington, N.C., he found out that two chemical companies had an arrangement to share production at certain times. "It gives you a better sense of how the capacity in an industry might be stretched," he explains.

Lacy, who collects information for the Beige Book and also drafts the Fifth District's summary before Owens edits the final document, interviews bankers and others working in the financial services industry. He typically calls the same people he has nurtured in his eight years with the Bank. "We try to talk with people who are working directly with customers," Lacy says. "We try also to have a mixture of small banks and big banks and banks in different states, so it's fairly representative."

Keeping an open mind, as well as asking the standard sets of questions, can inspire colorful comments, remarks Faye Ball, who calls residential real estate contacts and temporary employment agencies. Here are a few examples from a recent Beige Book:

- A banker reports that borrowing is sluggish, except among beer and wine retailers. "People drink more in a bad economy," guesses a source.
- There appear to be some bright signs in manufacturing. A respondent notes that his industry has "cleansed itself of weaker companies," enabling it to "put up the sail and go with the wind."

It's hard to know exactly what these bits and pieces of information say about the economy. Yet the comments can often point to a trend in the making. Owens cites an example.

"Some years ago, the general impression was that inflation in the United States was at a moderate rate and perhaps price pressures were likely to accelerate," he recalls, adding that Fifth District respondents had reported little change in prices even though significant forecasts were reporting the opposite. "By the time we looked back, their reports were correct. I thought at first they were perhaps misinterpreting the question. But their responses were accurate."

Speaking of accuracy, does the Beige Book actually get it right? Nathan Balke and D'Ann Petersen, economists at Southern Methodist University and AMRESCO Commercial Finance Inc., respectively, evaluated how well the book reflects economic activity.

"My co-author and I read all the Beige Books, over about a three-month period," Balke says, adding that they focused on books from 1983 through 1996. They tried to infer what the descriptions were saying about

Surveys of the manufacturing and retail/ services sectors are released on the second Tuesday of each month.

economic growth and then attached a numerical score to the description. "We shuffled the Beige Books so we didn't know what time period they were referring to. We tried to guard against using our knowledge of what actually happened."

The two found that the Beige Books "do have significant predictive content for current and next quarter real GDP growth. Furthermore, the Beige Book has information about current quarter real GDP growth not present in other indicators such as the Blue Chip Consensus Forecast or time series models that use real-time data."

Economists in research departments throughout the Federal Reserve System filter anecdotal information, says Balke, transforming it into keen insights. "They use that information and use their own judgment about what that information is saying about the economy. It's hard to sort it out, whether it's the information from the contacts or the judgment of the staff that's providing most of the information. My sense is that probably both are important."

Each District's Beige Book contribution reflects its unique regional economy. For example, the Federal Reserve Bank of Dallas calls on energy companies—including refineries, chemical companies, and oil and gas extraction industries—which continue to play an important role in the area's economy.

"It's [energy] still pretty big here, it's about 6 percent to 7 percent of output right now," says Mine Yücel, senior economist and vice president of the Dallas Fed.

The people who provide information to the Federal Reserve Banks for the Beige Book become valuable contacts who may be called on for quick facts. For example, after 9/11, the regional group hit the telephones to find out from real estate agents whether deals in progress would go through, among other investigations. "We get this very rich information," Owens notes. "We can quickly and efficiently get accurate, on-the-ground assessments of what's going on."

The ability to interview is as handy as a head for figures, Owens notes. But many economists haven't honed this skill.

"You're taught in school the econometric techniques, to pound on the numbers," he says. "What you're never taught in school is to go out and talk to people and listen to people. That's the lesson the whole regional section has taken to heart." **RF**

Visit **www.rich.frb.org/pubs/regionfocus** for links to relevant Web sites.

An Update on Check Services

The Winter 2003 issue of *Region Focus* included an article on the Federal Reserve's role in the check clearing process. (See "The Check Business," pp. 2-4.) Since publication, the Federal Reserve System has announced a major restructuring of its check services.

All Reserve Banks, including the Federal Reserve Bank of Richmond, will reduce the operating costs of their check services by taking such measures as streamlining the check management structure, reducing staff, decreasing the number of processing locations, and increasing processing capacity at remaining locations. These changes are in response to nationwide declines in check volume as consumers and businesses increasingly use electronic methods of payment.

Currently, 45 locations in the Federal Reserve System process checks and 43 locations perform check adjustments. By the end of 2004, 13 processing sites and 31 adjustment sites will close. As many as 1,300 positions at these locations may be eliminated, but approximately 900 jobs will be created at the remaining sites to handle the extra volume transferred to them.

In the Fifth District, check services are provided in Baltimore, Md.; Charleston, W.Va.; Charlotte, N.C.; Columbia, S.C.; and Richmond, Va. The restructuring plan calls for the Charleston office to transfer its processing and adjustment operations to Cincinnati and Cleveland, respectively, while the Columbia office will move both operations to Charlotte. Since the Charleston and Columbia offices provide only check services, they will be closed. In addition, Richmond's check processing will move to Baltimore and its check adjustments will relocate to Charlotte.

All told, about 225 check services positions in the Fifth District will be eliminated. However, the Richmond Fed expects to add about 100 positions in Baltimore and Charlotte to handle their increased processing and adjustment workloads.

The restructuring plan is expected to reduce annual systemwide operating costs for check services by about $60 million starting in 2005. The goal is to help the Federal Reserve System recover the cost of providing payment services to financial institutions, a requirement of the federal Monetary Control Act of 1980. While the Fed earned an average annual after-tax return on equity (ROE) of 12.2 percent for its payment services from 1992 to 2001, declining check volumes and other factors reduced its after-tax ROE to 4.2 percent in 2002.

"Nationwide, consumers and businesses have made a significant shift in how they make payments, substituting electronic payments for checks. This development is good news for the nation's payments system," says Cathy Minehan, president and CEO of the Federal Reserve Bank of Boston and chair of the Federal Reserve System's Financial Services Policy Committee. "But declining check volumes are requiring the Reserve Banks to make changes in their check operations to address the challenges posed by the changing market. [The restructuring plan] will help us meet these challenges."

—Charles Gerena

Covering the Cost of Terrorism

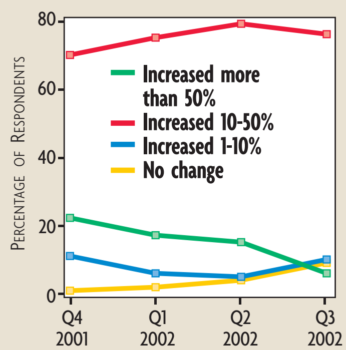
BY CHARLES GERENA

The tragic events of Sept. 11, 2001, made it frighteningly clear that the United States was vulnerable to terrorist attacks. Fear suddenly gripped the nation, including insurers faced with claims that surpassed the record $17 billion in insured losses from Hurricane Andrew in 1992. Uncertainty about future attacks led to a much-publicized shortage of terrorism coverage that rippled through the economy. In response, Congress approved a bill last November that puts Uncle Sam in the terrorism reinsurance business.

Reinsurance companies provide primary insurers with additional capital to cover extraordinary claims after a major disaster. But the Sept. 11 attacks forced reinsurers to reassess the likelihood and extent of damage from terrorists. Many firms decided to stop underwriting terrorism risks when policies came up for renewal in 2002. With fewer reinsurers willing to risk their capital, primary insurers were forced to lower their maximum payouts on terrorism-related claims, increase premiums to cover terrorist attacks separately, or exclude coverage altogether.

England faced the same problem in the 1990s. Reinsurance firms dropped or limited their terrorism coverage in response to a long string of bombings perpetrated by the Irish Republican Army. This led business interruption and building insurers to reduce their exposure to terrorism-related risks. The British government responded by creating a mutual company that provides reinsurance to its member firms. Spain, France, and Germany also have federal reinsurance programs that cover terrorism risks, while Israel has a special fund that pays for property damage triggered by politically motivated violence.

Independent Insurance Brokers and Agents Who Reported a Change in Commercial Property Premiums During the Quarter



SOURCE: Commercial Insurance Market Index surveys, The Council of Insurance Agents and Brokers

Why have governments stepped into the private marketplace to cover terrorism risks? After a major disaster, "coverage declines and prices go up because insurers don't have as much capital" to cover claims in the near term, says Anne Gron, assistant professor of management and strategy at Northwestern University. Eventually, however, rising prices "encourage capital to come into the industry" and insurers determine how to cover a similar disaster in the future.

Robert Hartwig, senior vice president and chief economist at the Insurance Information Institute, believes that it would have taken awhile for the terrorism insurance market in the United States to adjust. "And some insurers wouldn't have participated [in the market] at all," he adds.

Congress decided not to wait. The Terrorism Risk Insurance Act nullified existing exclusions of terrorist acts and required insurers to cover terrorism in a manner that "does not differ materially" from other aspects of their policies.

The bill also created a federal program that will back the insurance industry when an attack results in claims exceeding $5 million. For each claim, the program will cover 90 percent of insured losses paid to policyholders. But this coverage kicks in only after the insurer meets a deductible based on its premiums received in the previous year. In 2003, the deductible will be 7 percent of premiums collected, then it will rise to 10 percent of premiums in 2004, and 15 percent in 2005.

Lawmakers were concerned that the high costs of terrorism insurance could damage an already soft economy. In particular, they worried that, without government action, many new construction projects would be postponed or foregone.

Some insurance experts argue, though, that Congress didn't need to create a broad reinsurance program. That's because the shortage of terrorism coverage has affected mostly high-profile properties and densely populated cities. The Consumer Federation of America recently researched the availability of coverage and found that "there were very few problems, mostly centered in New York City," says J. Robert Hunter, director of insurance of the Arlington, Va., group. "The problem with New York is that all of the buildings are right up against each other. If a bombing occurs, it hits a whole bunch of places at once. Insurers were worried about concentration of risk." Chicago also had problems, but not Los Angeles since it is spread out over a larger geographical area.

Another argument against federal terrorism reinsurance is that insurers were already making progress in calculating and pricing terrorist risks. Premiums for some policies were falling and new risk models were in the works.

Finally, Hunter and others worry about the economic implications of the federal government providing reinsurance at no cost. Will the private sector be less willing to offer reinsurance because they won't want to compete? Will insurers be less likely to encourage their policyholders to reduce their terrorism risks because they won't suffer the full financial consequences?

Despite these concerns, the new program will hopefully introduce certainty into the insurance industry. "Insurers understand that in the event of a future terrorist attack they are going to sustain losses," concludes Hartwig. Now, "insurers know what their maximum possible loss is. [And] they can make sure they have adequate capital to handle the worst-case scenario." **RF**

TRANSPORTATION PLANNING

Charlotte Tackles Transit and Land Use Together

CHARLOTTE, N.C. — The freedom and convenience of automobiles is tough to beat, especially in metropolitan areas where multiple commercial and residential centers are spread out over long distances. Mass transit can't serve these areas as efficiently because the population is too dispersed.

Charlotte is hoping to tackle this conundrum by simultaneously planning denser development and a regional transit system. Work should begin this year on the first leg of the $3 billion system, the most expensive transportation project in the works for North Carolina.

While sprawl will continue, the city's integrated transit and land-use plan will encourage the creation of traditional neighborhoods where home, work, and shopping are just a train or bus ride away. "[We want] to concentrate the majority of future growth in five major travel corridors; create mixed-use, pedestrian-friendly developments [along the corridors]; and construct a transit system to support them," describes Ronald Tober, chief executive of the Charlotte Area Transit System. "It will take time [but] it will be better from an environmental standpoint by keeping down the loss of trees and farmland, as well as keeping down vehicle miles traveled."

John Silvia was skeptical about this plan at first. Silvia, chief economist at Wachovia Corp., says Charlotte is fairly dense, but not as dense as other cities with transit systems like Chicago.

Now, he is more optimistic about the success of Charlotte's transit system because of its flexible implementation. In areas with sparser development, like the southeast corridor leading to suburban Matthews, rapid-transit buses will operate along roadways separated from traffic. In more developed areas, like the southern route to the town of Pineville, light rail with greater passenger capacity is planned.

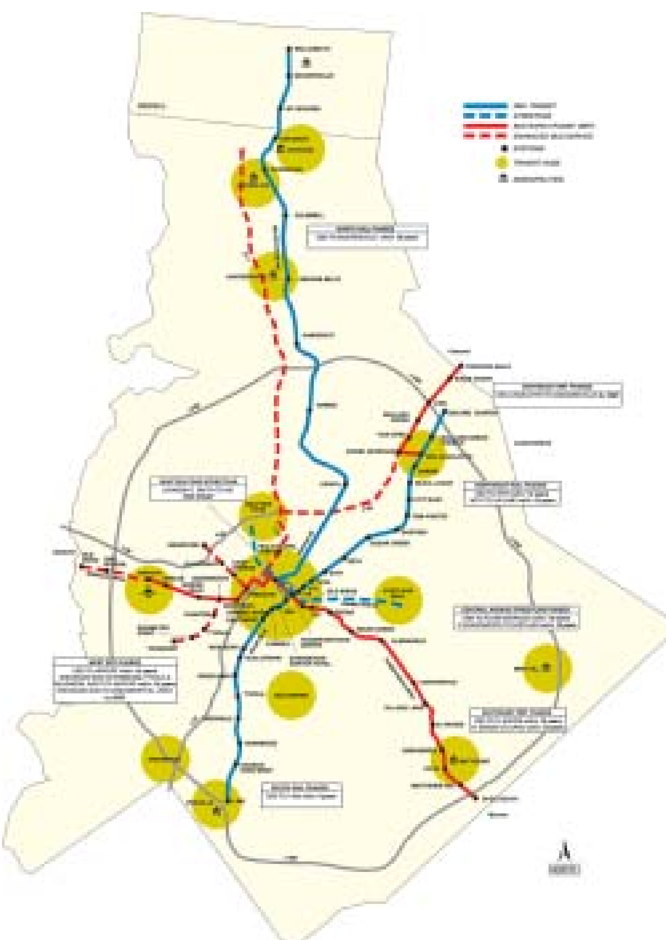
Charlotte's approach is innovative, but will it relieve congested highways? According to research by transportation consultant Wendell Cox, new rail routes tend to draw commuters away from bus lines, not out of their cars. Moreover, "Charlotte does not have a strong bus ridership base to feed light rail," Cox wrote in a recent report.

Also, can mass transit accelerate economic activity, or does the activity have to occur first? Silvia believes it can happen either way, but a train station or bus stop doesn't guarantee development of the surrounding area. He points to some stations in Chicago where little has changed and others that have become bustling centers of commerce. The key is having other elements in place to support growth, such as sufficient land for development.

Of course, the community must want more growth. Pineville was supposed to have a light-rail station serving its downtown, but local officials opposed it because of their concerns about traffic. A small town can get overwhelmed by people, notes Silvia.

— CHARLES GERENA

The Charlotte Area Transit System will use a combination of rapid-transit buses, streetcars, and light-rail trains, depending on population density.



CHARLOTTE AREA TRANSIT SYSTEM

MEASURING HAPPINESS

How Happy Are You?

Economists have entered the realm of happiness research, asking such questions as how do economic conditions and legal institutions affect people's perceptions of well-being? The results reveal a great deal about economic behavior, says Carol Graham, vice president and director of the Governance Studies Program at the Brookings Institution. "Things like economic security, employment status, health, and marital status are much more important than the standard [economic] models assume," Graham notes.

In a book published on the subject in 2002, Graham and co-author Stefano Pettinato examine data from 17 Latin American countries and from Russia. Among other things, they find that relative income differences have important effects on how people assess their well-being, and that those people in the middle or lower middle of the income distribution are more likely to be dissatisfied than are the very poorest groups.

In a working paper called "Does Happiness Pay?" Graham and co-author Maria Fitzpatrick investigated panel data for 6,500 respondents in Russia from 1995 to 2000. The paper found that "static variables such as gender, stable marital status, and education levels are more likely to have effects on normal happiness levels, while changes in socioeconomic or marital status (particularly divorce) are more likely to cause fluctuations in happiness levels." What's more, happiness and positive expectations about the future correlated positively with higher future income, while low self-esteem and negative perceptions were linked to smaller increases in income.

In other happiness research, economists have found that in western industrialized nations, average happiness hasn't kept pace with rising per capita incomes, so money may not buy happiness after all. For example, in the United States, per capita real income increased 2.5 times from 1946 to 1991, but happiness, on average, remained constant, according to established findings. The same thing happened in Japan, according to several scholars. In 1991, people in Japan made six times the amount of money they did in 1958, but average life satisfaction remained exactly the same as it did in 1958. So what gives? Economist Richard Easterlin of the University of Southern California published an article in the *Economic Journal* in 2001 that shows that as people earn more money, they want more money. Easterlin says he searches for patterns among the data. "For the population as a whole, the pursuit of income as a source of happiness is illusory," he says.

Investigations into happiness open "a whole new way of thinking about economic measures and progress, based on one of the oldest concepts in history," Graham says.

—Betty Joyce Nash

INDUSTRY CLUSTERS

Bringing Biometrics to West Virginia

West Virginia has fostered its high-tech industry for years, especially in communities along a 35-mile stretch of Interstate 79 in the north central portion of the state. With the help of state and federal officials, a growing number of scientists in the region are expanding the frontiers of biometrics, technologies that identify individuals by their physical and behavioral characteristics. What will it take to translate this research activity into commercial activity and jobs?

The global biometrics market was worth around $119 million in 2000. Terrorism threats have accelerated efforts to control access to buildings and sensitive information, leading industry analysts to expect the market to finally take off. Until now, widespread adoption of biometrics technology — ranging from retinal scanners to voice verification systems — has been slow and the industry has remained fragmented.

Given the nature of the biometrics industry, companies will need compelling reasons to cluster in north central West Virginia. Economist Michael Hicks at Marshall University describes a few economic factors that generally lead to an agglomeration of industry.

First, a region could have attributes that make it cheaper to produce a particular product or service, such as easy access to human capital and technology. In the case of the biometrics industry, Hicks says that companies save money by locating where there are scientists and laborers who work with electronics.

The I-79 corridor has this human capital. The FBI's fingerprint database is headquartered in Clarksburg, the


WEST VIRGINIA UNIVERSITY

Biometric technologies like this hand reader identify individuals by their physical characteristics.

Department of Defense's Biometrics Fusion Center is temporarily based in Bridgeport, and West Virginia University has developed a Center for Identification Technology Research in Morgantown. In addition, the university teaches biometrics as part of its forensic science program.

Second, Hicks says companies could be drawn to a region where many people need a particular product or service. While locating factories near such a customer base doesn't always save money, there are marketing advantages to having a sales or service office close by. "It's easier to give a call to a local guy," notes Hicks. Consequently, biometrics companies serving government agencies in the mid-Atlantic may establish a presence in the region.

Ralph Bean Jr., chairman of the I-79 Development Council, believes the region's good quality of life and its telecommunications infrastructure should attract biometrics firms. However, West Virginia needs more venture capital to really get the industry off the ground.

So far, California-based Ethentica by Security First Corp. plans to move to Fairmont this year, and there are rumors of other companies considering a similar move. Nonetheless, an agglomeration of biometrics firms may be years away from forming in a state with a history of natural resources-based industry.

"Changing economic forces is like moving the Titanic," says Hicks.

—Charles Gerena

BALTIMORE BOOSTS PAY FOR SOME WORKERS

Living Wage Laws

Across the country, roughly 90 communities have passed "living wage" laws. The measures require companies that do business with city or county governments to pay their workers more than the federal minimum wage of $5.15 an hour. The exact amount varies, but the wage is supposed to be sufficient to support a family of four at a level above the federal poverty line, according to the Association of Community Organizations for Reform Now (ACORN). In some cases, the living wage has been set as high as $12 an hour.

The living wage movement is generally acknowledged to have gotten its start in Baltimore. In 1994, the city passed a law requiring private companies with city contracts to pay their workers $6.10 an hour. Over time, that figure has risen and now stands at $8.49.

The law was controversial from the beginning. Many people predicted that it would harm Baltimore's already struggling economy and bust the city's budget. Others argued that a living wage would reduce government spending on social-service programs aimed at helping the poor.

Eight years later, the law remains controversial. The Employment Policies Institute, for instance, claims that "contract costs did, indeed, rise rather than fall after the implementation of Baltimore's living wage legislation." But a report from the Economic Policy Institute (EPI) says that the law has helped "workers in Baltimore without significant financial cost to the city. Moreover, the evidence suggests that higher wages and hours improve the stability and reliability of the work force." The EPI report concedes, though, that the living wage has aided only a small group of workers and that employer noncompliance remains a serious problem.

David Neumark, an economist at Michigan State University, has tried to reconcile such varying claims. In a nationwide study of living wage laws, Neumark argues that the measures have had modest success combating poverty. The reason: since coverage is limited to employees of city contractors, only a tiny fraction of low-income workers are affected. Instead, the major benefits have accrued to unionized municipal workers. By raising the wages that private firms have to pay, Neumark writes, "living wage laws may reduce the incentives for cities to contract out work that otherwise would be done by municipal employees, hence increasing the bargaining power of municipal unions and leading to higher wages."

According to ACORN, four other Fifth District communities — Alexandria, Va., Charlottesville, Va., Durham, N.C., and Montgomery County, Md. — have already passed living wage laws. Richmond, Va., is also considering doing so.

—Aaron Steelman

TUITION COSTS CLIMB

But Enrollment Is Still Up

State budget cuts have forced public colleges and universities to raise tuition. Nationally, tuition costs at public colleges increased almost 7 percent in the most recent year, up from roughly 3 to 4 percent in previous years.

State schools in the Fifth District likewise saw unprecedented tuition hikes. At West Virginia University (WVU), for instance, tuition increased by 9.5 percent from the 2001 to the 2002 academic year. Statewide budget cuts, which have hit higher education particularly hard, have forced "the school to recoup some [of the loss] by raising tuition," says Bill Nevin, external communications manager at WVU. "Yet last fall, the school enrolled 23,000, its highest enrollment in several years. And graduate enrollment increased by 1.8 percent."

In January, the Board of Regents of the University System of Maryland approved a mid-year 5 percent tuition hike. "This is a cyclical pattern, it has happened before, it will happen again," says Laura Perna, assistant professor of education policy at the University of Maryland, College Park. "The real danger is that these tuition increases are occurring at a time when families are facing a lot of other financial challenges brought on by layoffs and declines in their personal portfolios. Just like the states, families are finding they also have fewer financial resources."

Despite the increases in tuition, enrollment figures at the Fifth District's public universities continue to rise. Graduate enrollment, in particular, may be positively affected by the sluggish economy. The reason: unemployed workers having a hard time returning to the job market may decide to go to school to improve their skills.

—Elaine Mandaleris

Tuition at West Virginia University increased by 9.5 percent from the 2001 to the 2002 academic year.

MATT KINGSLEY/FRB RICHMOND

Inflation

BY AARON STEELMAN

Most people have a general idea of what inflation means: a rise in prices. But the issue can get confusing when you move to specifics, because inflation is measured in so many different ways. Three of the most common measures are examined below.

Consumer Price Index

When you hear a news item about inflation, chances are the reporter is talking about the Consumer Price Index (CPI). The CPI tracks the change in prices paid by urban consumers for a market basket of goods and services. That basket is made up of more than 200 categories, arranged into eight major groups: food and beverages, housing, apparel, transportation, medical care, recreation, education and communication, and other goods and services. The CPI also includes government-charged user fees (such as auto registration fees) and taxes that are directly related to the sale of a good or service (such as sales taxes).

More than 2 million workers are covered by collective bargaining arrangements that tie wage increases to the CPI. What's more, the CPI is used to adjust tax brackets and transfer payments, such as Social Security.

The prices of certain items within the CPI basket tend to change more than others. The "core CPI" is an attempt to control for that problem. It excludes food and energy, because their prices are often volatile on a month-to-month basis. The core CPI usually gives a better measure of where inflation is headed in the near future.

ILLUSTRATION BY TIMOTHY COOK

Recently, the CPI has been criticized for overstating inflation, for a variety of technical reasons. Consider the problem of "quality bias." "New and improved products often cost more because of their enhanced features. In theory, however, such improvements should not count as a net price increase to the consumer," writes Kevin Kliesen of the St. Louis Fed. "Examples that improve living standards include new medical procedures and more energy-efficient central air conditioners. While difficult, accounting for this quality change is nevertheless necessary." The Bureau of Labor Statistics (BLS), which compiles inflation figures and reams of other economic data, is refining the way it estimates the CPI in response to such criticisms.

Producer Price Index

While the CPI measures the prices paid by the consumer, after production is complete and the item is ready for sale, the Producer Price Indexes (PPIs) measure prices earlier in the process, when companies are buying the materials they need to make finished products.

PPIs are available for more than 10,000 individual items and are frequently used as the basis for contract escalator clauses. For instance, a long-term contract for bread could be indexed to account for changes in the PPI for wheat.

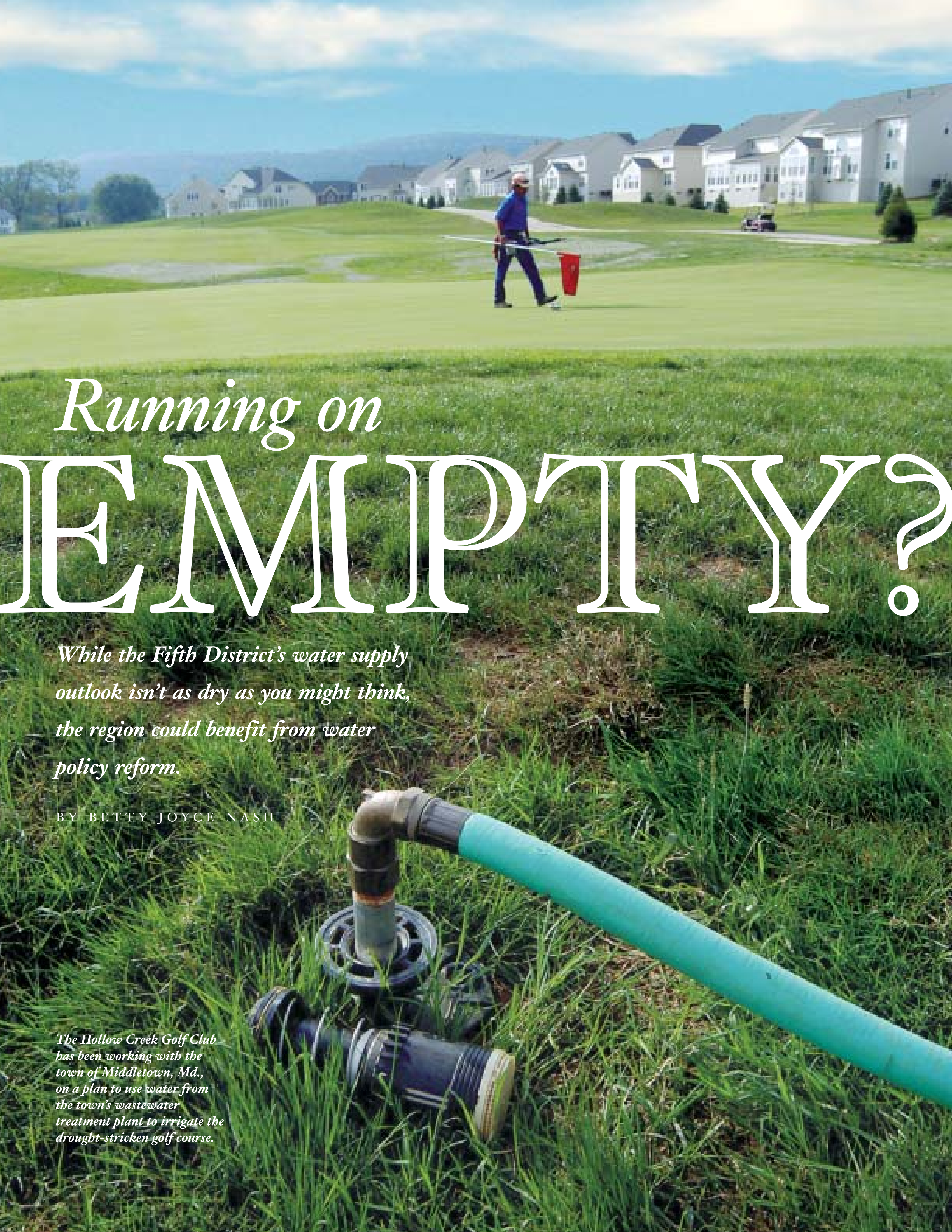
"Seasonally adjusted" PPI and CPI numbers are also available. According to the BLS, seasonal adjustment is a statistical technique that "eliminates the influences of weather, holidays, the opening and closing of schools, and other recurring seasonal events from economic time series. This permits easier observation and analysis of cyclical, trend, and other nonseasonal movements in the data. By eliminating seasonal fluctuations, the series becomes smoother and it is easier to compare data from month to month."

Personal Consumption Expenditures Price Index

The Department of Commerce's Bureau of Economic Analysis compiles the Personal Consumption Expenditures Price Index (PCEPI). The PCEPI differs from the CPI in important ways. First, the formula it uses for combining component prices is known to better approximate true changes in standards of living. Second, it tracks the prices of several items that are completely left out of the CPI. Third, it assigns different weights to certain categories of goods and services. For example, in 1996, physician expenses amounted to roughly 3.77 percent of the total spending that falls within the scope of the PCEPI, but just 1.89 percent of the CPI market basket. Finally, the PCEPI takes into account "substitution effects" — that is, when consumers replace one product with a lower-priced alternative, over time the weights on those products shift accordingly. The weights in the CPI, in contrast, remain fixed for years at a time.

The CPI and the PCEPI often track fairly closely. But in a recent paper, Dennis Fixler and Ted Jaditz of the BLS note that there have been "several periods where the differences between the two inflation rates is large." For instance, CPI inflation was 2.4 percent from December 2001 to December 2002, while inflation as measured by the PCEPI was 2 percent over the same period.

The PCEPI hasn't replaced the CPI as the inflation measure of choice. But it's increasingly popular with economists and policymakers. **RF**



Running on EMPTY?

While the Fifth District's water supply outlook isn't as dry as you might think, the region could benefit from water policy reform.

BY BETTY JOYCE NASH

The Hollow Creek Golf Club has been working with the town of Middletown, Md., on a plan to use water from the town's wastewater treatment plant to irrigate the drought-stricken golf course.

When rainfall swells streams, water supply worries wash away. But when the rain stops, questions over ownership, supply, use, allocation, and price bubble to the surface, creating turbulence among users.

Water knows no boundaries. Whether it flows through the deep aquifers beneath the earth or in the powerful rivers on the planet's surface, water quenches the thirst of industry, households, agriculture, and recreation, keeping daily life processes and commerce flowing.

Like much of the East, the Fifth District has historically been awash in water. And still is, says Leonard Shabman, a resident scholar in environmental policy with Resources for the Future (RFF), a Washington, D.C., think tank.

"I don't want to underplay the drought," he says, adding that the economic and ecological system has adapted to the amount of water that's there, whether it rains every day or once a year. "And then the question becomes, given that resource, to what uses will you put it?"

In other words, water, like any other commodity, can become scarce. The trick is to determine how to best manage its allocation, given competing social needs.

The 2002 drought is prompting states to manage water differently, says Terry Wagner, director of water resources management for the Virginia Department of Environmental Quality. Virginia's latest drought, one of the worst in a century, highlighted supply issues and exacerbated conflicts.

"Whether the drought continues or not ... we will see increases in potential for competition for water resources," Wagner says.

Free Water

There's nothing like scarcity to bring about change.

"When there are no droughts, there are no choices — people don't think about it," Shabman notes. But the legacy of recent droughts coupled with exploding populations in the District's urban areas has put water allocation, along with pricing and conservation measures, in the spotlight.

AP PHOTO/RICKY CARIOTI

AP PHOTO/THE DAILY PROGRESS, ANDREW SHURTLEFF

Water conservation signs were prominent all over the University of Virginia campus as students and faculty worked together in an effort to conserve water at the University and the surrounding Charlottesville, Va., area during the 2002 drought.

Traditionally, people pay for water based on provision of plants, pipes, and treatment services. Pricing the water itself is an idea economists sometimes advocate but is politically unpalatable, says Jim Boyd, an economist at RFF. People perceive water, like air, as a birthright. Water comes from God, the joke goes, but he forgot to put the pipes in the ground.

"The fact is, people waste water," says Boyd. "It's free."

Echoing Boyd's observations is Stephen Ragone, science and technology director of the National Groundwater Association.

Complicating the consumption issue is the required value now attached to leaving water in place, Ragone says. There's an inherent tension between private uses of water and its public-good attributes, those that benefit everyone.

Ragone notes water's commodity and common-good values, each serving the other. For example, low river levels have docked industrial barges, preventing commerce as well as fostering pollution. Water protects endangered species and dilutes potentially toxic pollutants, a public service. "If you don't have surface water, you don't have ecosystems," Ragone says. And the same goes for groundwater. In many parts of the country, he says, excessive groundwater withdrawals have caused the earth to sink in spots. "When you pump out the water, you remove the pressure that water conveys on the clays and sands and then it collapses.

"When you create imbalance by only pricing water for its commodity use, we're building in future problems. ... A lot of people are saying, we have to get back to more natural use patterns. Use it where you live and return it to where you live."

Water experts throughout the District are reaching similar conclusions.

"We used to be in the Garden of Eden: there was so much water we didn't need to worry about it. You could just pluck fruit from the tree. Now there are more of us and we use more water," says John Morris, director of the North Carolina Division of Water Resources. His state's water supply is being stretched by a 21 percent increase in population between 1990 and 2000 — much of that in urban and coastal areas. "There's still enough to meet our social needs, but we have to plan ahead and manage it better, make our users manage it efficiently."

Price Tag

Though the East may be years away from pricing raw water, the cost of service can help regulate water flow. Water rates are undoubtedly headed up as stringent federal drinking water laws and aging water infrastructure drive up costs. The General Accounting Office estimates future investments in drinking water systems could range from a low of $12 billion annually to a high of $20 billion. Experts seem to agree that higher prices are on the way and that could help spur conservation.

Water appears to be a "natural monopoly;" that is, it requires substantial conveyance infrastructure so it is efficient for one enterprise to invest rather than many. Most water treatment plants that serve municipalities are publicly operated as self-funding entities. But private corporations are increasingly buying water systems and competing for management contracts (see sidebar on p. 14).

Historically, the Southeast has used declining rate structures to price water, partly as an incentive to lure industry. The more water used, the less it costs. Such thinking was particularly beneficial to heavy water users, such as textile producers. But as the South's industrial base has changed and as water becomes more precious, the philosophy behind water rates is changing too, according to Lex Warmath. He is vice president of Raftelis Environmental Consulting Group Inc. of Charlotte, N.C.

It's the average homeowner who uses the most water in urban areas, Warmath says. "In communities like Charlotte and Cary, N.C., residential usage is 75 percent to 90 percent of total usage.

"[There have been] some technological innovations that allow industries to use less water. But {with} residential growth, neighborhoods continue to expand ... with a lot of green areas," he says. And along with the suburbanization of the Southeast comes the big house with the big yard, expected to be green 12 months a year. It's not uncommon to find new homes with five bathrooms instead of the two bathrooms common decades ago, he notes.

"People continue to build houses with large lawns and that creates a huge, seasonal water demand," Warmath says.

Warmath consults with public utilities to set rates that recover costs as well as other objectives, which vary by community. "[One] objective that is coming to the forefront is what can we do with our rates that encourages people to use water more wisely? You can be aggressive in your rates or just send a little reminder," Warmath says, depending on the political climate and level of affluence in the community.

One community he's worked with is Cary, N.C., just outside Raleigh and home to such mega-employers as IBM and SAS Institute. Cary sought water solutions as its population jumped from about 3,300 people in 1960 to 105,000 today, says Kim Fisher, director of public utilities. The town put in place a water conservation program in 1996, including a plan to sell reclaimed water, or treated wastewater, to customers with underground irrigation systems.

"We estimated on a peak day we could divert a million gallons a day if we had a reclaimed water system," Fisher says. "... this past June, when it was so stinking hot and dry, our peak day was 1.2 million gallons." In the summer, he explains, between 40 percent to 50 percent of water demand can be for irrigation.

Cary aims also to change water use patterns through behavior. Advertising, increased water rates, and water use restrictions send the message that the water supply is finite.

"Over the last three to four years, our total water sales revenues have been pretty level," Fisher notes. The rate structure is now an increasing block rate, meaning that if customers use less water, they'll get a discount. As they use more, they'll pay for that luxury.

Cary may be atypical because of its affluent and educated populace, but many communities are being forced to review prices, Warmath says. Historically, the federal government provided money to build water treatment plants, but that money dried up in the 1980s, as responsibility for infrastructure was pushed down to state and local levels.

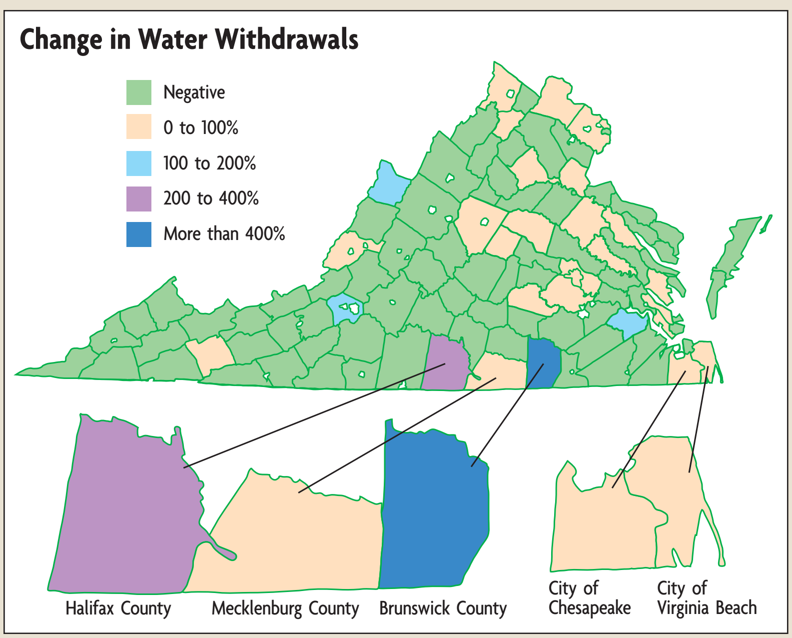
Raising the price of water may conserve supply, but the price elasticity for water suggests that a 10 percent increase would decrease demand by only about 2 percent. Only a dramatic price hike would get people's attention, Warmath says. "You'd be amazed at how much you have to raise the price to make people stop using water. Realistically, people's water bills still tend to be about half what their cable bills are."

Doubling the price of water does get results, Warmath says. Still, price isn't everything. "The price does matter, but it's not a solution in getting people to significantly change their habits in the short term."

Even with aggressive water reduction targets, there's bound to be a supply problem if the population keeps growing. Say a community cuts water use by 20 percent in 10 years but is

Water Goes Where the Demand Is

Daily water withdrawals increased 721 percent in Brunswick County from 1990 to 2000, even though population growth in that county was only 15 percent during the same period. Part of that increase is due to withdrawals from Lake Gaston, where up to 60 million gallons of water are transported daily to the city of Virginia Beach.



SOURCE: National Water-Use Information Program, U.S. Geological Survey

Desalination Opens a New Spigot for Water Utilities


DARE COUNTY WATER DEPARTMENT, DARE COUNTY, N.C.

Parts of coastal North Carolina depend on desalted groundwater to supplement their water supply. Dare County, N.C., has built three desalination plants over the last 14 years to support their burgeoning residential development and tourist trade.

Coastal communities in the Fifth District have supported a growing number of thirsty residents and businesses for decades. As they continue to deplete their freshwater sources, however, supply constraints loom. Many have resorted to desalination to develop saltwater sources.

Distillation, the most common method of removing salt from water, has been around for centuries. Saltwater is heated until it evaporates, then the vapor is condensed into freshwater. Two other desalination methods were developed during the latter half of the 20th century, electrodialysis and reverse osmosis. Both filter salt using membranes, thin barriers that permit only particles of a certain size or type to pass through.

All three methods consume a lot of energy, accounting for up to half of a desalination plant's operating costs. They also require specialty materials that can withstand corrosion. As a result, desalination is relatively expensive compared to traditional water treatment techniques. "For the typical city with freshwater sources that are not environmentally sensitive, a utility would not look at desalination because of the cost," notes Ben Movahed, a Beltsville, Md.-based engineer and president of the American Membrane Technology Association.

However, desalination is becoming more cost competitive. One reason is the rising fiscal and ecological toll of building reservoirs, pipelines, wells, and other infrastructure to meet water demand. "There are more cities, especially coastal cities, that are running out of freshwater…or cannot withdraw it without an environmental impact," explains Movahed. "Those are the cities that are looking at desalination."

At the same time, the cost of desalination has fallen. "In the last five to seven years, the membranes have dropped 50 percent in price," says Neil Callahan, who heads the Tampa office of R. W. Beck Inc., a consulting and engineering firm.

This has helped broaden the market for desalination. In addition to unlocking new water supplies, membranes are used to remove heavy metals, bacteria, and other contaminants from water.

Still, water utilities can't afford to produce potable water from the blue seas surrounding coastal communities. Seawater, as well as groundwater near the surface, is very salty, requiring more energy for the desalination process. In addition, the water must be pre-filtered.

Instead, utilities typically desalt water far below the surface in deep aquifers, which are relatively abundant along the Atlantic Coast. This water isn't as salty because it has seeped through layers of clay and sand before collecting in the aquifers.

On the Virginia Peninsula, Newport News Waterworks operates a desalination plant that taps into aquifers as deep as 1,000 feet. The water produced from the plant is "two to three times more expensive" than water from the utility's four reservoirs, according to Ronald Harris, chief of water resources. Nevertheless, he believes the cost to the utility's customers in Hampton, Newport News, Poquoson, York County, and James City County is justified.

Harris says the desalination plant is needed to augment the Peninsula's water supply until the King William Reservoir is built. During the last drought, surface water supplied about 55 million gallons a day to Waterworks' customers, but daily demand almost reached that level. Without the four-year-old desalination plant, Harris says there would have been a risk of a shortage.

Other Peninsula communities have turned to desalination to supplement their water supplies because the new reservoir could take at least 10 years to complete. James City County is one of them.

"Based on our projected demand, we knew that we didn't have adequate water to meet our needs in four years," says Larry Foster, general manager of the James City Service Authority. Even now, the county has a tough time in the summer, when outdoor water use increases demand by 60 percent to 80 percent compared to the winter season.

While these communities supplement their water supply with desalted groundwater, parts of coastal North Carolina depend on it.

For example, Dare County has built three desalination plants over the last 14 years, pushing up wholesale water rates for beachfront towns like Nags Head from 75 cents per thousand gallons in the 1980s to as high as $1.35, according to utilities director Robert Oreskovich. The towns had to pay the higher cost of desalted water to support their burgeoning residential development and tourist trade. "Groundwater desalination was the least expensive alternative," he says.

In Southern California, water utilities built desalination plants to avoid the expense of new aqueducts, notes engineer Neil Callahan. Florida also has a significant number of plants because the state has lots of coastline and certain areas are hot and dry, he explains, limiting freshwater supplies.

Tampa Bay officials hope to achieve seawater desalination on a large scale where Key West and Santa Barbara, Calif., failed to do so economically. Their strategy is to operate a 25-million-gallon desalination plant within a power generation facility. This enables the plant to utilize some of the seawater drawn from Tampa Bay to cool the power facility's generators. Also, the plant's briny waste product is mixed into the water that the power facility already discharges into the bay. Consequently, Callahan says the plant needed fewer permits since its environmental impact is minimized, and it requires less pumping and discharge equipment.

If the Tampa Bay project succeeds, Movahed and others believe the approach of co-locating desalting and power generation facilities could serve as a model for future desalination projects.

—Charles Gerena

growing at 5 percent a year. "Your water use will still go up, and if you've got a supply problem, your situation is going to get worse."

In Concord, N.C., a bedroom community for Charlotte, town officials knew their water and sewer rates didn't reflect the true cost of operations. The town recently implemented rate structures for residential and industrial users aimed at conserving their limited water supply.

In Eastern North Carolina, the town of Kinston relies on deep groundwater in the Black Creek Aquifer. Historically, industries such as textiles and tobacco processing, along with domestic and agricultural water use, have sucked too much from the aquifer for it to properly recharge. The state is requiring Kinston to reduce withdrawals. That means that, by 2016, it will need to cut its dependence on the aquifer by 75 percent, according to Ralph Clark, Kinston's city manager.

He explains that the deep water was cheap and good. Maybe too cheap and too good. "What's happening is we're taking out more than is being recharged," he says. "Now is the time to address the problem rather than waiting until you're 100 feet down." The water needed virtually no treatment, he says, admitting the city was spoiled. "We had been used to getting this high-quality water at virtually no cost."

But all that's changing, as Kinston recently formed a water and sewer authority to build a surface water treatment plant to take the burden off the slow-to-recharge aquifer. It won't be cheap. Estimates have come in at $110 million.

Clark says that selling that change to consumers will be a tough job. "The consumers are going to be re-educated one way or the other, through pricing or conservation. It's going to be a real challenge."

Hot Water

During the dry spell in the summer of 2002, the pressure on water supplies intensified debates among water users sharing a single source. Such conflicts are common, but they are often about issues other than water, notes economist Shabman. He consulted on the Lake Gaston project, an effort that pipes water from the Roanoke River Basin 125 miles to Virginia Beach, Va., approved after years of court wrangling. "In that case it was about, 'This [was] our water and you can't have it,'" he says. Virginia Beach succeeded in its efforts largely because the opposition could not make the case they would be harmed by the withdrawal, Shabman says.

Like all flowing waters, the Yadkin-Pee Dee River system respects no man-made boundaries. It runs from the foothills of the Appalachian Mountains to the Atlantic Ocean near Myrtle Beach, S.C. In North Carolina, six

The Privatization Wave

Most Americans get their water from public utilities, including some whose aging pipes and treatment plants are reaching the end of their useful life. A growing number of local governments are turning to privatization to address these infrastructure needs, as well as to reduce operating costs and to meet stricter water quality and safety standards.

In some cases, a private firm will acquire a region's water facilities outright. But more commonly, it will simply manage the facilities of a public water system. When this occurs, the locality continues to own the system and set water rates, while the firm agrees to perform a variety of tasks, from billing and meter reading to operating and maintaining facilities. The reasoning is that private contractors can run a water system more efficiently.

"If [a public utility] can't get rid of incompetent people, privatization can be a way of getting around that restraint," notes Gary Wolff, principal economist and engineer at the Pacific Institute for Studies in Development, Environment, and Security in Oakland, Calif. Also, utilities may be unable to keep up with the latest regulations and cost-saving technologies, especially those in smaller communities that can't afford to train workers and attract the best talent. "A private company that services . . . different utilities can have a [knowledge] base that is top notch and can be shared with every community," says Wolff. In general, such economies of scale are possible when a company manages enough utilities such that adding an additional client has a small impact on total costs.

But private companies aren't always more efficient, says Michael Arceneaux, deputy director of the Association of Metropolitan Water Agencies in Washington, D.C. "There are plenty of public water utilities that can do things just as efficiently or better." Many have sought ways to trim the fat from their operations and improve their asset management, Arceneaux claims.

In the final analysis, smaller water utilities appear to have the greatest chance of benefiting from partnering with private industry. "The most fertile ground for privatization is in small and medium-sized communities that are, in most cases, strapped for cash," explains Jeffrey Jacobs of the National Research Council's Water Science and Technology Board, which recently published an assessment of the effectiveness of privatizing water utilities. "These communities have a small number of users [and] often don't have a healthy tax base to generate the resources for its utility."

This was the case with Reidsville, N.C. The city of 14,500 residents awarded a five-year contract to Hydro Management Services Inc. to operate and maintain its small water system. Steve Routh, public works director, says Hydro's managers have broader expertise than the city's longtime staff because they work at more than a dozen water utilities other than Reidsville's. "We use the expertise of the management staff, and the company keeps us informed of when we will need upgrades," says Routh.

Still, the contract doesn't relieve Reidsville of the financial burden of making major repairs and improvements — Hydro pays only for repairs under $300 — and Routh admits that significant labor savings weren't achieved.

Other private-public agreements have been more problematic. United Water managed Atlanta's water system since 1999, but was repeatedly accused of responding too slowly to customer complaints and service calls. The 20-year contract was dissolved in January.

The lesson is that privatization can be a useful option, but management contracts between municipalities and private water companies must be written "in a way that benefits both sides, and maintains the public interest," notes Arceneaux.

—Charles Gerena

Major Rivers and Lakes

About 95 percent of water withdrawals in the Fifth District come from surface sources, according to 1995 estimates from the U.S. Geological Survey. The rivers with the largest withdrawals in each state are highlighted below, as well as a few other sources of drinking water.

Rivers

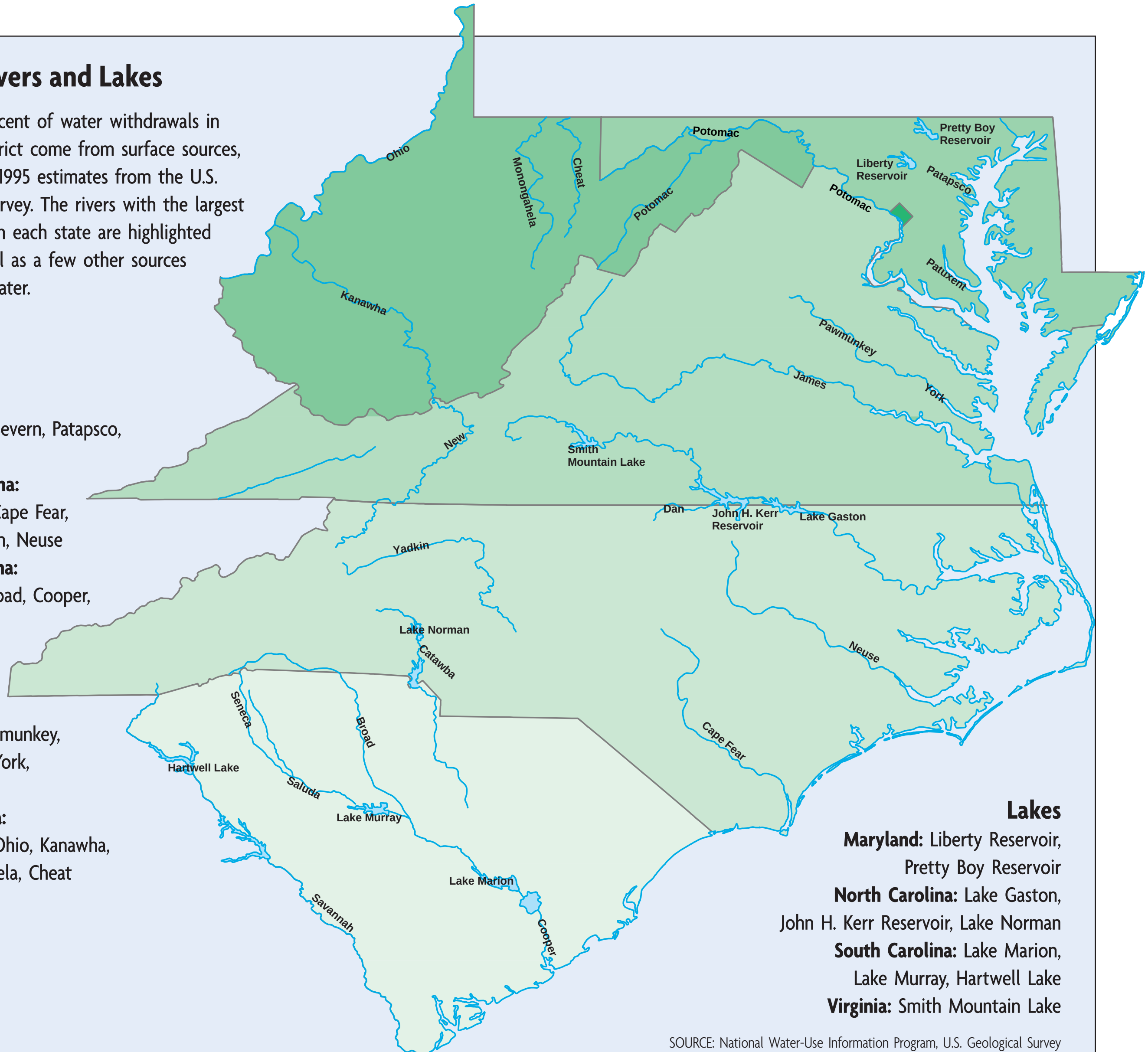
Maryland:
Potomac, Severn, Patapsco, Patuxent

North Carolina:
Catawba, Cape Fear, Dan, Yadkin, Neuse

South Carolina:
Seneca, Broad, Cooper, Savannah, Saluda

Virginia:
James, Pawmunkey, Potomac, York, New

West Virginia:
Potomac, Ohio, Kanawha, Monongahela, Cheat



Lakes

Maryland: Liberty Reservoir, Pretty Boy Reservoir

North Carolina: Lake Gaston, John H. Kerr Reservoir, Lake Norman

South Carolina: Lake Marion, Lake Murray, Hartwell Lake

Virginia: Smith Mountain Lake

SOURCE: National Water-Use Information Program, U.S. Geological Survey

hydroelectric dams on the Yadkin River store water in lakes, which supply power, recreation, habitat, and drinking water. The Yadkin River dams, which must be relicensed by 2008 by the Federal Energy Regulatory Commission (FERC), are required to release water to keep the river flowing to users downstream in South Carolina. There, the waters dilute wastewater discharges of industry and keep saltwater from intruding inland into the river, which Myrtle Beach and the Grand Strand tourist area taps for drinking water.

But during the drought, the FERC-mandated release of 1,400 cubic feet per second dropped lake levels dramatically. Negotiations ensued.

"We were able to negotiate with the state of South Carolina, FERC, and the utility companies to come up with a different plan," says Morris of North Carolina's Division of Water Resources. "Basically, we said to South Carolina, 'You're happy you're getting this water now, but if we keep doing this, we're going to run out of water.' That would have been a real disaster for them. What we worked out was an agreement that South Carolina would accept a lower flow … 900 cubic feet per second. That slowed down the process of emptying the lakes."

Happily, by September, it rained and the lakes filled.

"But it shows us when new licenses are issued, we need a flexible, thought-out plan that would go into the licenses that would minimize damage and have a fair sharing of the burdens should we have to go into emergency operations again."

The Yadkin River water issues are likely to play a central role in public comment during the relicensing process.

The drought got everybody's attention in a big way, says Monty Crump, who is the city manager of Rockingham, N.C., and also works with the Yadkin-Pee Dee Licensing Coalition.

"For years, we were all fat, happy, and sassy and thought there was an unlimited resource," he says. "You got this drought and boom … all of a sudden you have all these folks coming to the table."

While water supplies may not be in a state of constant crisis, North Carolina has nevertheless required jurisdictions to

Water Systems on Guard

The Sept. 11 terrorist attacks have prompted a major reallocation of resources throughout the economy. More money is going towards securing the nation's critical infrastructure, from airports to seaports to utilities.

However, the nation's water systems are inherently difficult to protect in the view of Stephen Schmitt, vice president of security programs at American Water Works Company Inc., headquartered in Voorhees, N.J. He says that plants and pipes weren't built to be secure against terrorist attack. Schmitt and others in the water industry believe that much work lies ahead to identify potential threats, assess the vulnerability of water utilities to those threats, and install monitoring and communications systems to warn against an attack.

Terrorists don't have a shortage of recipes for disaster. A cyber attack could cripple a water facility's automated equipment. Or a bomb could destroy a facility's pumps and reduce water pressure for firefighters and other critical users. While few scenarios would likely affect a large number of people, attacking key elements of a water system would cause "significant economic cost, inconvenience, and a loss of confidence," says Dr. Nabil Adam, director of Rutgers' Center for Information Management Integration and Connectivity (CIMIC). Adam led CIMIC's effort to form a Laboratory for Water Security.

Since the anthrax scare in 2001, many people worry about terrorists poisoning an entire water system. In fact, water experts say that many toxins would probably become too diluted to be effective if they were dumped into a river or reservoir, or they would be neutralized during the treatment process. A few chemical and biological agents are resistant to chlorine, but it would take large quantities of these substances — or anything else — to have a systemwide effect.

Given the difficulties of attacking the water supply at its source, a more effective option would be to introduce toxins at a water treatment facility. Or terrorists could target certain neighborhoods or buildings by contaminating their pipes. In general, distribution systems are harder to protect than water sources. Pipes and valves form vast networks under major cities, and all of them can't be locked up or placed under 24-hour surveillance.

The scope of these security challenges will force municipal and private water utilities to make hard choices about how much they can do. European countries installed early warning systems at major rivers, despite the expense of installing and maintaining these systems. Government officials didn't want to be caught off guard again after a warehouse fire in 1986 dumped 30 tons of toxic chemicals into the Rhine River.

Back in America, drinking water is closely scrutinized. Real-time monitoring systems at plants detect minute changes in temperature, mineral content, and other factors that affect water quality, but they can't detect biological and chemical agents. And they only know when something is wrong — further tests must be done in order to determine the problem.

Before water utilities can effectively guard against terrorism, water monitoring systems must become more advanced. But the market may take a while to develop.

Some utilities may not want to increase their capital and maintenance costs to improve water monitoring.

In the Washington, D.C., metropolitan area, utilities are already under pressure to rehabilitate their infrastructure and adhere to new regulatory standards, says James Shell Jr., principal water resources planner for the 18-member Metropolitan Washington Council of Governments. "They have to prioritize and determine what is more critical to do. A lot of them . . . think the Potomac River would be a difficult target to contaminate because of its size and the volume of water that is coming through."

Also, utilities are interested in systems that "have multiple uses, and won't just be fire alarms," says Christopher Owen, president and COO of Apprise Technologies Inc. in Duluth, Minn. But companies like Apprise are reluctant to begin the research and development process until they know what federal standards for water security might need to be met.

Until new monitoring technology is commercially available, water utilities are relying on existing equipment. Some use sensors to "extrapolate" or estimate the presence of toxic substances in water, describes Glenn Patterson at the U.S. Geological Survey's Office of Water Quality. Others employ Mother Nature. They expose sentinel species such as bacteria, algae, clams, and fish to the water supply and observe their behavior. If they react to a foreign substance, the water is tested to see what the substance is.

In the end, water utilities alone may not be able to secure the nation's water supply. Regional partnerships between utilities, state regulators, and federal agencies could prove essential.

—Charles Gerena

provide water supply plans since the early 1990s. The state also regulates inter-basin transfers of water. In gathering this data, the state can plug the leaks in wasteful use and theoretically avoid serious water troubles in the future.

"These [supply plans] have been fabulous data sources to any kind of inquiry," Morris says. "You can use it to see whether there are conflicts among the different plans. The next frontier is to do plans by river basins. We try to look 50 years ahead and determine if those water needs can be borne by that basin and, if not, what adjustments might be needed."

Virginia Gov. Mark Warner is proposing water policy reform to encourage local governments to develop water supply plans. Such reforms have previously failed, but the recent drought may still be fresh in legislators' minds.

The Commonwealth has had its share of water fights, with the states allowing conflicts to be resolved in the courts, such as the Lake Gaston issue. Virginia is currently sparring with Maryland over Fairfax County's application to build a new intake pipe in the Potomac River for its 1.2 million customers. Maryland claims ownership of the river bottom by right of a colonial grant, but Virginia is entitled to certain rights under a 1785 pact. Agreements are under way among stakeholders along the James River as a water treatment plant is under construction just upstream from Richmond. The list goes on.

Foresight Keeps Water Flowing

While disputes have garnered headlines, there are cases where jurisdictions have cooperated to keep water supplies flowing.

In the Washington, D.C., metropolitan area, for example, three major water utilities operate independently.

AP PHOTO/THE CHARLOTTE OBSERVER, ROBERT LAHSER

Workers connect the first section of water line at the Kings Mountain City reservoir at Moss Lake near Shelby, N.C. The city of Shelby is paying for 8,000 feet of water line to connect Shelby's water system to the reservoir.

But 20 years ago, the utilities agreed to share the $100 million cost of storing water for use during dry spells in the Jennings Randolph Reservoir on the Potomac River. Officials at the Interstate Commission decide when and how much water should be released.

"Without cooperation, these guys could end up in court battling each other," says Curtis Dalpra, communications manager for the commission. "They have given up a little power to create a very healthy situation."

As competition for water supplies grows, states' roles could expand as well.

"The state has not been forced to take a position up to this point on what is the appropriate role in the management of the resources," says Terry Wagner of Virginia's Department of Environmental Quality. "Until you have physical conflicts, you'll never develop the political will necessary [to change]. We're just starting to see the physical conflicts.

"We're moving to a point where we have to consider the effects of water resource withdrawals on other users. That's a major shift. Until you really have problems, it's tough to get over that entropy of the last 200 years."

Marketing Water

A murky question surrounding water use in the East is that of ownership. Exactly who owns water anyway? Under Eastern water law, anyone can take water from a stream as long as so doing won't harm others, says RFF's Shabman. "You don't own the water rights in the sense that you own your car and can sell it to somebody else." In some places in the West, people who use a certain amount of flow in streams establish a right to that water. Under those circumstances, they can sell or rent those rights.

In California, for example, a controversial proposal still in negotiation includes diversion of water from the Imperial Valley Irrigation District for Southern California. That district has held rights to 70 percent of California's water from the Colorado River for 100 years under the first-come, first-served doctrine.

Water transfers and trading would require some definition of rights in the East, says Clay Landry, an economist located in Wyoming who values and prices water for jurisdictions interested in creating markets for water. Landry has begun consulting with some clients in the East, he says, as droughts deepen thoughts on creative solutions.

The first step in establishing workable markets, Landry says, would be to establish a property right that could be transferred and traded. Florida, he says, has begun looking into the idea.

Creating a market for buyers and sellers, he says, reallocates a scarce resource using money. In times of scarcity, water can be allocated by regulation or through markets. Voluntary agreements have a niche in the marketplace, he says, but negotiations tend to drag and sometimes culminate in court actions.

"The fundamental difference? With a trading program, there's money involved," he says. "When you put cash on the table, things just move a little quicker."

In some Western states, he says, irrigation districts have hammered out agreements that compensate them when water is transferred to cities during a drought. Conversely, a district will buy extra water to irrigate during critical watering periods for agricultural products. For example, a water market emerged in 2001 in Yakima, Wash. Apple growers needed water to protect future yields of orchards. The market was established and monitored by a partnership between the state and the federal Bureau of Reclamation, according to Landry.

"Basically, there were uses in the basin that had lower values placed on the water, and they were able to sell some of that water to orchards who were willing to pay quite a bit of money to save their orchards," he says. "Essentially, [the market] allowed the water to move to its higher valued use for that time. Federal and state agencies also purchased some water for flow augmentation for salmon recovery," he says. In that particular instance, it was a one-time deal, but the state is now working to establish rules that would allow the market to occur in any year.

Whether the East's water woes bring about changes to the East's property rights regime, or increased state oversight, improved cooperation, or all three, water will flow to people, Shabman says.

"We're not going to relocate people to the Great Lakes from Atlanta," he jokes. "It's just a matter of cost and decisionmaking, and if in the next 50 years, 50 percent of our population chooses to move to Southern California, we'll get water to them." **RF**

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The shortage of affordable malpractice insurance in West Virginia and elsewhere won't be easy to solve.

A Difficult Diagnosis

BY CHARLES GERENA

When malpractice insurance premiums started rising in West Virginia three years ago, doctors had few options. They could either find a way to lower their premiums or quit.

Medical professionals throughout West Virginia made some tough choices. City Hospital in Martinsburg closed its psychiatric unit, and hospitals in Putnam and Jackson counties shuttered their obstetrics units. Bluefield Regional Medical Center in southern West Virginia stopped performing angioplasties and open-heart surgeries.

"Obstetrics, orthopedics, neurosurgery, and general surgery are among the highest-risk medical fields," describes Tony Gregory, director of communications for the West Virginia Hospital Association. Since they are riskier, "they produce the most medical liability suits," and their practitioners pay the highest premiums. At the same time, reduced reimbursements from governmental payers have resulted in less revenue to offset premium increases.

Shortages of affordable malpractice insurance have occurred throughout the United States, with critical shortfalls in at least 12 states, including West Virginia, Pennsylvania, New Jersey, Nevada, and Mississippi. This problem is merely one symptom of larger issues facing insurers and a range of health care providers, from physicians to dentists to nursing homes.

Reports of doctors marching in front of government buildings and patients crossing state lines in search of care seem unprecedented. In fact, malpractice shortages occurred twice in the last 30 years.

An insurance company makes money in two ways, and both income sources are vulnerable to economic cycles. First, it achieves an underwriting profit, or loss, based on the difference between the premiums it collects and the expense of servicing policies, which includes claims paid and other administrative costs.

Second, the insurer can earn income to offset an underwriting loss by investing premiums in stocks, bonds, and other appreciable assets. "If an insurer knows that the payout is five or six years from now and it has certain administrative costs, it has to decide what to do with that money in the meantime," explains economist Frank Sloan of Duke University.

During the mid-1970s and mid-1980s, malpractice insurers faced poor investment returns. They also had more claims. According to economist Patricia Danzon of the University of Pennsylvania, the frequency of malpractice claims per 100 doctors jumped 10 percent annually between 1975 and 1985. During these "hard markets," insurers had to adjust other variables in their revenue-expense equation to maintain profitability. Premiums increased and requirements tightened for policyholders.

Many malpractice premiums dropped or increased modestly during the 1990s, until signs of a hard market emerged in the latter part of the decade. Underwriting losses started rising as claims outpaced premiums. Insurers say they were adrift in the choppy waters of tort law, which compensates injured patients and serves as a deterrent against future acts of malpractice.

"If an insurer has the perception that there is a lot of uncertainty with respect to judgments ... it doesn't know how to price the coverage," says Sloan. The firm could raise premiums or concentrate on other lines that are less volatile.

According to the West Virginia

WEST VIRGINIA STATE MEDICAL ASSOCIATION

Drs. Elizabeth Spangler, Kenneth Wright, and Michael Fidler speak with Senate Minority Leader Vic Sprouse (center) about West Virginia's malpractice insurance crisis.

Hospital Association, several insurers merged or left the state in the early to mid-1990s, and a major carrier declared insolvency in 1997.

The picture was just as cloudy nationwide, recalls Andrea Wood, spokesperson for The St. Paul Companies, formerly one of the nation's largest malpractice insurers. But firms like St. Paul believed they had enough reinsurance and good investment returns to carry them through to better days.

The new millennium brought two major shocks to the insurance market that quickly made matters worse for malpractice insurers. The Sept. 11 terrorist attacks caused many primary insurers to pay more for reinsurance and to increase their reserves for covering claims. Also, three straight years of stock market declines that began in 2000 evaporated insurers' investment returns.

Given the hardening of the malpractice insurance market, something had to change. Premiums jumped nationwide starting in 2000.

Not only did malpractice insurance become pricier, it also was hard to find. Many small insurers had such low reserves that they ceased operations, including PHICO Insurance Co. in Pennsylvania. A few large insurers stopped offering malpractice coverage, including The St. Paul Companies. "We determined that even with the double-digit rate increases that we're working on getting approved, we wouldn't be able to maintain profitability in that line of business," explains Wood.

In the Fifth District, some doctors in the Carolinas lost their malpractice coverage, but they had alternatives. A physician-owned mutual insurance company covers half of North Carolina's doctors in private practice, while a state-operated Patients' Compensation Fund provides excess coverage for more than three-quarters of South Carolina's private physicians. Still, malpractice insurance costs a lot more in both states and elsewhere in the region.

With an already limited supply of insurers, the Mountain State has been hit hard by the lack of affordable malpractice coverage. St. Paul's departure was devastating since the company insured about one-third of the state's doctors. Then the withdrawal of a smaller firm, OHIC Insurance, in 2002 added insult to injury. Only one major malpractice provider remains, Medical Assurance, and its policy standards are tighter.

Now, the malpractice market is narrower and more selective. Eugene Pawlowski, president of Bluefield Regional, says that just one lawsuit can cause a doctor to lose coverage, and then it's difficult to find another provider. "Smaller communities in West Virginia don't have the alternatives that bigger states like Virginia and North Carolina have."

Why are fewer insurers willing to do business in West Virginia? Some observers blame the state's reputation as a haven for litigation, due to its relatively lax tort system and sympathetic juries. While such a link is hard to prove, data from the National Practitioner Data Bank suggest that the state stands out. The number of malpractice payments in West Virginia rose from 8.1 to 11.5 per 100,000 people between 1995 and 2001, while the rest of the Fifth District had far fewer payments per capita (see graph at right).

Perhaps West Virginia's relatively unhealthy population makes it an expensive market to serve. The state's mortality rate for heart disease was 22 percent higher than the national average in 2000, the cancer rate was 14 percent higher, and the rate for chronic lower respiratory disease was 44 percent higher.

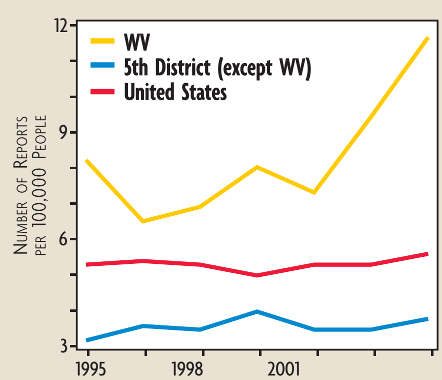
To make sure that West Virginians have access to health care, state lawmakers approved a temporary malpractice insurance plan during a special session in December 2001. Physicians can be insured for up to $1 million by the state's Board of Risk and Insurance Management (BRIM), which provides general liability coverage for state agencies, county and municipal governments, and nonprofit organizations.

Nearly 1,100 doctors and 12 hospitals have purchased malpractice insurance from BRIM so far. While BRIM's base rate was 5 percent lower than the commercial rate in West Virginia in late January, premiums still were higher for certain specialties like neurosurgery.

More Malpractice in the Mountain State?

The number of malpractice payments in West Virginia rose modestly from 147 in 1995 to 207 in 2001. But these numbers tell another story when taking the state's population into account. Compared to the rest of the Fifth District and the United States, West Virginia's payment experience per 100,000 people is quite high.

Number of Medical Malpractice Payment Reports, Per 100,000



NOTE: Per capita figures calculated using population estimates, except for actual Census count for 2000.

SOURCES: National Practitioner Data Bank, U.S. Department of Health and Human Services; U.S. Census Bureau

Fixing the Tort System

In January, West Virginia Gov. Bob Wise and President Bush proposed tort reform plans. Here's how they stack up.

Reform	Explanation	Proposed by Gov. Wise?	Proposed by Pres. Bush?	Adopted in 5th District
Limit non-economic damages	Awards for pain and suffering are capped; exceptions for cases of wrongful death and gross negligence are often made	YES [a, d]	YES	YES (MD, VA, WV)
Limit punitive damages	Awards to compensate plaintiffs in excess of actual damages are capped; commonly used to punish defendants for reckless misconduct and deter others	NO	YES	YES (NC, VA)
Eliminate joint-and-several liability	Defendant is not liable for paying the entire judgment, but only for his/her share of responsibility for an injury	YES [b, d]	YES	YES (DC)[c]
Change collateral source rule	Damages can be reduced by all or part of the value of lost wages or medical bills paid by third parties, including workers' compensation and health insurers	YES [d]	YES	NO
Permit periodic payment of damages	Instead of a lump sum, damages can be disbursed over time; this is typically done through an annuity that pays out periodically	NO	YES	YES (DC, MD, VA)

[a] Gov. Wise proposed lower noneconomic damages from a cap of $1 million to a base cap of $250,000, with a sliding scale based on severity of injury.
[b] Joint-and-several liability rules were relaxed somewhat in West Virginia in 1986. Doctors are liable for the entire judgment only when their share of responsibility exceeds 25 percent.
[c] In the District of Columbia, liability for punitive damages is apportioned by relative fault.
[d] Proposal included in legislation passed by General Assembly in March 2003.

SOURCES: "State Laws Chart: Liability Reforms," American Medical Association, April 2002; "Summary of Medical Malpractice Law," McCullough, Campbell & Lane, 1998; "State Laws on Medical Liability," American Tort Reform Association Web site, 1994

Costs for malpractice coverage are still high, argue tort reform advocates, because not enough has been done to reduce the frequency and size of tort claims. In his State of the State speech in January, Gov. Bob Wise proposed several reforms to address this concern. His recommendations included a base cap of $250,000 for pain and suffering and other noneconomic damages and a limit of $500,000 for damages against trauma care providers. Wise also proposed creating a three-year, $20 million fund to offset premiums paid by doctors in the BRIM program. (See sidebar above for a summary of Wise's proposals and similar reforms proposed by President Bush.)

In response to malpractice insurance shortages during the 1970s and 1980s, some states modified their tort law. Did these changes lead to more affordable coverage? According to a report by the U.S. Congress' Office of Technology Assessment, only caps on damage awards were consistently effective.

Tort reform hasn't been the cure-all some had imagined. That's because damage awards account for just part of a malpractice insurer's expenses. When setting premiums, an insurer must factor in the price of reinsurance, the administrative costs of investigating claims, and lawyers' fees for defending claims in court.

Therefore, buyers and sellers in the malpractice insurance market also must find solutions to the current shortage. Some hospitals have started self-insuring. Bluefield Regional uses its own money to cover the first $5 million in claims, and reinsurance from AP Capital to pay for claims above that amount.

So far, the hospital has succeeded in providing insurance at cheaper rates than BRIM. "I have better risks," notes Pawlowski. "The state takes the bad doctors with the good doctors. I'm just taking the good doctors."

But not all hospitals will be able to afford to do this. Some medical professionals will probably have to face the choice of paying more for malpractice insurance, retiring early, or moving out of the state.

If history is any guide, though, the overall ranks of the medical profession will continue to swell. Despite past spikes in malpractice premiums, America's supply of doctors has steadily grown from 366,000 in 1975 to 750,000 in 2001. So far, a sense of purpose and the promise of profits seem to have outweighed the increasing cost of doing business. **RF**

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UP IN *Smoke*

Fifth District States Are Burning Through Tobacco Settlement Funds to Balance Their Books

BY KARL RHODES

North Carolina Gov. Michael Easley was the state's attorney general in 1998 when major U.S. cigarette manufacturers negotiated a master settlement agreement (MSA) with 46 states and the District of Columbia. The manufacturers agreed to pay an estimated $206 billion to reimburse the states for health care expenses related to tobacco use. It was the largest product liability settlement ever, but Easley and several other state attorneys general demanded more.

They insisted that the manufacturers should pay an additional $5.15 billion to tobacco farmers and quota owners in 14 tobacco-producing states over 12 years. These "Phase II" settlement payments were designed to indemnify farmers against declining demand for tobacco caused by several provisions of the MSA. Since North Carolina grows far more tobacco than any other state, its farmers receive the lion's share of these payments. But North Carolina's legislators decided to do more to help the state's struggling farmers, so they earmarked 25 percent of North Carolina's MSA payments to benefit tobacco growers and quota owners.

The tobacco farmers cheered, but their good fortune was short-lived. Easley, who had championed their cause as attorney general, moved up to the governor's office, where he was greeted by a huge deficit in 2001 and an even bigger one in 2002. To ease these financial pressures, he turned to the Tobacco Trust Fund Commission, the organization charged with using the 25 percent of North Carolina's MSA payments to help the state's tobacco farmers.

Easley intercepted a $32 million tobacco settlement payment in April 2002; he removed $50 million from the trust fund in June 2002; and the General Assembly is diverting another $38 million from the trust fund's 2003 tobacco settlement payments.

North Carolina desperately needs the money to balance its budget, and so do the other states in the Fifth District. All of them are using tobacco settlement payments to balance their budgets to some extent. The spectrum ranges from Maryland, which is using nearly all of its settlement payments to fund health care programs, to the District of Columbia, which securitized all of its settlement payments into one lump sum to pay down debt. Securitization is achieved by selling bonds that are secured by payments from the MSA. In exchange for its rights to future MSA payments, D.C. got an immediate infusion of cash, and it avoided the uncertainties of receiving payments from companies in a declining industry.

Payments from the MSA are supposed to be made in perpetuity, but they will decrease if domestic tobacco consumption falls below certain benchmarks. Based on the original estimate of $206 billion over 25 years, the Fifth District states were looking at the following projected revenue streams: North Carolina ($4.6 billion), Maryland ($4.4 billion), Virginia ($4.1 billion), South Carolina ($2.2 billion), West Virginia ($1.7 billion), and Washington, D.C. ($1.2 billion).

All of the states devised ambitious plans to spend this money, but as the first payments started to arrive, the stock market went into a tailspin and the national economy dipped into a recession followed by a sluggish recovery. The states are now faced with severe budget deficits, and they are struggling with the question of how much tobacco settlement money they should use to balance their budgets.

In addition to cash-strapped state governments, there are many other interests competing for the same dollars. They include smoking prevention programs, health care initiatives, economic development programs, and the tobacco farmers themselves.

In North Carolina, the intense debate over who gets what is complicated by the Phase II payments to tobacco farmers and quota holders. Are these Phase II payments enough to offset the hardship caused by the MSA? North Carolina's Tobacco Trust Fund Commission put that question to A. Blake Brown, professor of agricultural and resource economics at North Carolina State University. Brown's study, co-authored by Jonathan Perry, concluded that the present value of projected losses attributed to the MSA was $654.9 million to $764 million for the state's tobacco farmers and quota owners. In sharp contrast, they concluded that the present value of Phase II payments to North Carolina growers and quota owners was $1.216 billion to $1.223 billion.

Before Brown and Perry conducted their study, Brown warned the Tobacco Trust Fund Commission that the numbers probably would shake out that way, but the commissioners insisted that

A Trip Down Tobacco Road

1612 Jamestown colonist John Rolfe plants Nicotiana Tabacum seeds from the West Indies. Growing this variety of tobacco for export to England becomes the first successful industry in Virginia.

1620s Tobacco dominates the economy of the Chesapeake Bay region for the next 150 years. It is commonly used as currency throughout the Southern colonies. People literally grow cash on their farms or in their gardens.

1640s Looking for fresh land for tobacco production, Virginians begin migrating into the Carolinas.

1660s A glut of tobacco in England devastates the colonial economy, but by 1700 the colonies are once again exporting a record level of the crop.

1730 Virginia requires growers to bring tobacco to public warehouses for inspection. Maryland, North Carolina, and South Carolina eventually adopt similar systems.

1776 Tobacco helps finance the Revolutionary War by serving as collateral on loans from France.

1794 Congress passes the first U.S. tax on tobacco.

1839 Stephen, a slave in Caswell County, N.C., discovers bright leaf tobacco, which is later used extensively in cigarettes.

1850s Tobacco harvests hit record levels in Virginia, but the state's soil is nearly exhausted from growing too much tobacco.

1865 Tobacco growers struggle to recover from the Civil War and their dependency on slave labor.

1875 R. J. Reynolds begins to mass-produce chewing tobacco in Winston, N.C.

1880 The first cigarette-making machine is patented.

1890 The Duke family of Durham, N.C., consolidates the major U.S. cigarette manufacturers into the American Tobacco Co.

1902 Philip Morris begins marketing cigarettes in the United States.

1911 Trust busters split the American Tobacco Co. into several of its component companies including Liggett and Myers, P. Lorillard, R. J. Reynolds, and the new American Tobacco Co.

1913 R. J. Reynolds introduces Camels, the first cigarette brand to gain nationwide popularity.

1914 Cigarette consumption explodes during World War I.

1933 The Agricultural Adjustment Act of 1933 institutes price supports for tobacco — the beginning of the quota system.

1941 American soldiers get cigarettes in their rations during World War II.

1944 The American Cancer Society begins to warn people about the potential risks of smoking.

1955 Philip Morris introduces the Marlboro Cowboy in advertising campaigns.

1964 The Surgeon General issues a landmark report on "Smoking and Health."

1966 Health warnings from the Surgeon General are required on cigarette packs.

1971 The United States bans cigarette advertising on radio and television.

1985 Philip Morris buys General Foods, and R. J. Reynolds buys Nabisco.

1991 A Medical College of Georgia study shows that Joe Camel is as familiar to young children as Mickey Mouse.

1994 Seven tobacco industry CEOs say tobacco is not addictive in testimony before Congress. Mississippi sues the major tobacco manufacturers to recover the cost of treating diseases related to tobacco use.

1998 Major tobacco manufacturers sign a master settlement agreement that calls for payments to 46 states estimated at $206 billion over 25 years. The other four states negotiate separate agreements.

SOURCES: www.tobacco.org; www.historian.org; R. J. Reynolds Tobacco Co.; Facts on File; www.druglibrary.org; The Duke Homestead; North Carolina State University; Pennsylvania Tobacco Prevention Network; and Walter Reed Army Medical Center they needed an independent analysis.

Gov. Easley used the study to further justify his raids on the tobacco trust fund. Brown notes, however, that the plight of North Carolina's tobacco farmers goes far beyond the impact of the MSA. "Total projected losses (attributable to all factors, such as MSA, excise tax increases, and declines in tobacco exports) to North Carolina burley and flue-cured tobacco growers and quota owners do exceed the projected value of Phase II payments," the study said.

But that bottom-line reality was overshadowed by the state's looming budget deficit. "Frankly, the governor was looking for an excuse to take away their funding," Brown says.

State Cigarette Taxes Per Pack

State	Cents	Rank Among States & D.C.
Maryland	100.0	11th
District of Columbia	100.0	11th
West Virginia	17.0	44th
South Carolina	7.0	48th
North Carolina	5.0	49th
Virginia	2.5	51st

NOTE: State taxes are in addition to a federal tax of 39 cents per pack.

SOURCE: Campaign for Tobacco-Free Kids

The tobacco trust fund is one of three organizations that North Carolina created as stewards of its tobacco settlement money. Half of the payments — about $82 million per year — go to the state's Golden LEAF Foundation, an organization that promotes economic development in North Carolina with an emphasis on regions that have been hurt the most by declines in the tobacco industry. The remaining 25 percent is supposed to bankroll the North Carolina Health & Wellness Trust Fund.

In August 2002, the Golden LEAF Foundation announced an $85.4 million economic stimulus package designed to promote North Carolina's biosciences industry.

So far, the Golden LEAF's funding has remained intact, but the Health & Wellness Trust Fund has not been as fortunate. Gov. Easley intercepted $32 million headed for that fund in April 2002, and the General Assembly is diverting another $40 million from the fund's 2003 tobacco settlement payments.

It's more difficult to take money from the Golden LEAF because Easley set it up as a foundation, explains William Upchurch, executive director of the Tobacco Trust Fund Commission. The trust funds, on the other hand, are full-fledged state commissions. "Our money is in a special account, but it's under state control," Upchurch says. "A couple of keystrokes and it's gone."

The diversion of dollars from North Carolina's trust funds is "unfortunate," says Carthan F. Currin, executive director of the Virginia Tobacco Indemnification and Community Revitalization Commission. "But states are independent political subdivisions, and they can make their own decisions about how to spend the funds."

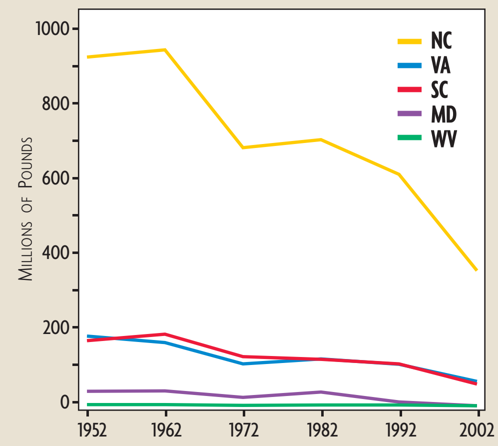
Currin's commission, which receives half of Virginia's tobacco settlement payments, has not been raided by the General Assembly, perhaps because 40 percent of Virginia's tobacco settlement payments routinely flow into the state's general fund. The remaining 10 percent goes to the Virginia Tobacco Settlement Foundation, which funds smoking-prevention programs.

Currin's commission helps Virginia's tobacco farmers, and it promotes economic development in southside and southwest Virginia, the regions of the state that are the most dependent on the tobacco industry. These areas also have been devastated by declining employment in textile manufacturing and coal mining, which were mainstays of their economies for most of the 20th century.

"Based on where the economies of these two regions are, the money is a godsend," says Currin. "I don't think it's too dramatic to compare our challenge to the Marshall Plan, which aimed to rebuild Europe after World War II."

Initially the commission focused on indemnification payments to tobacco farmers and quota holders. These pay-

Fifth District Tobacco Production



SOURCE: National Agricultural Statistics Service

ments are in addition to Virginia's Phase II settlement dollars, and they totaled $91 million in 2001 and 2002. After the indemnification is complete, the commission plans to focus all of its resources on economic development. Last year the commission reviewed about 100 applications for economic development grants. Most of the applicants received some funding, but Currin says the review process is becoming "tighter" this year.

Virginia also is in the process of securitizing its funding for the Tobacco Indemnification and Community Revitalization Commission. This bond deal would convert the commission's estimated 25-year revenue stream of $2 billion into a present-day endowment of $600 million to $700 million. Securitization will insulate the commission from potential reductions in tobacco settlement payments, and it will make the commission's funding "not bulletproof, but harder for future General Assemblies to raid," Currin says.

That seems to be the case in South Carolina, a state that securitized all of its tobacco settlement payments in the spring of 2001. South Carolina issued bonds that converted its projected revenue stream of $2.2 billion into a lump sum of $791 million. The state put $101 million of that sum into its Medicaid program to balance its current budget, but the structure of the bond deal will all but eliminate South Carolina's ability to use the funds to cover future deficits, says Les Boles,

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director of the Office of State Budget.

Of the original $791 million, South Carolina spent 15 percent to help indemnify its tobacco farmers, quota owners, and warehouse operators. It allocated 12 percent for economic development initiatives, with an emphasis on the state's tobacco-producing region, and it used 73 percent to create the Healthcare Tobacco Settlement Trust Fund. Most of the indemnification and economic development money has already been spent or spoken for, and the health care trust fund is down to about $400 million, Boles says.

All of South Carolina's budget-balancing Medicaid money came out of the health care trust fund, leaving just enough to endow a new prescription drug plan for senior citizens and a modest tobacco-prevention program.

An attempt to securitize West Virginia's tobacco settlement payments failed in last year's legislature, and now the state is facing a $200 million budget deficit for the coming year, says Bruce W. Adkins, acting director of the West Virginia Division of Tobacco Prevention.

To help close that gap, Gov. Bob Wise has proposed using $20 million from the state's medical trust fund to alleviate a medical malpractice insurance crisis, says John Law, a spokesman for the state's Department of Health and Human Resources. This would mark the first time West Virginia has touched its medical trust fund, which was set aside by the legislature to cover future health-related costs of tobacco use.

Half of West Virginia's tobacco settlement payments flow into this trust fund, while the other half goes to the state's Department of Health and Human Resources, primarily to help fund state-supported hospitals. This money has been a budget-balancing tool all along because it merely replaces dollars that were already allocated to the hospitals before the tobacco settlement. The new funds have solidified the department's budget, but they have not boosted it, Law says.

One exception to this rule has been the department's Division of Tobacco Prevention, which has received $5.8 million annually since the tobacco money started flowing. Adkins says he's fairly confident that West Virginia will maintain that funding level. It's significantly below the minimum amount of $14 million recommended by the U.S. Centers for Disease Control and Prevention, but it's far more than the state used to spend.

A report produced by the Campaign for Tobacco-Free Kids puts West Virginia in the middle of the pack among Fifth District states when it comes to spending money on smoking prevention. The report blasts all but a few U.S. states for failing to keep their promise "to use a significant portion of the settlement funds ... to attack the enormous public health problem posed by tobacco use."

How Fifth District States Allocated Master Settlement Agreement Money

State	Original Estimated Revenue Stream[a]	Securitized?	Health Care[b]	Economic Development	Tobacco Farmers[c]	General Fund	Debt Reduction[d]
North Carolina	$4.6 billion	No	25%*	50%	25%*	None	None
Maryland	4.4 billion	No	94%*	None	6%	None	None
Virginia	4.1 billion	Pending	10%	50%**		40%*	None
South Carolina	2.2 billion	Yes	73%*	12%	15%	None	None
West Virginia	1.7 billion	No	100%*	None	None	None	None
District of Columbia	1.2 billion	Yes	None[d]	None	None	None	100%*

* These funds have been used for budget-balancing to some extent
** Fifty percent split between economic development and tobacco farmers
[a] Based on 25-year projections made in 1998
[b] Includes funding of tobacco-prevention programs
[c] Does not include any Phase II payments
[d] Washington's debt-service savings are earmarked for Medicaid and other health care programs in fiscal 2003 and 2004

SOURCE: Individual states

State Funding for Tobacco Prevention

State	Annual Funding[a]	CDC Recommendation[b]	Percent of Recommendation
Maryland	$30.0 million	$30.3 million	99
Virginia	22.2 million	38.9 million	57
West Virginia	5.8 million	14.2 million	41
North Carolina	6.2 million	42.6 million	15
South Carolina	2.0 million	23.9 million	8
District of Columbia	None	7.5 million	0

[a] For fiscal 2003
[b] Minimum amount recommended for each state by the Centers for Disease Control and Prevention

SOURCE: Campaign for Tobacco-Free Kids

Maryland was the only Fifth District state to win praise in the report for raising its smoking-prevention program to the minimum level recommended by the Centers for Disease Control. Maryland and three other states have "heeded the evidence that tobacco prevention is both good public health policy that will reduce smoking and save lives and good fiscal policy that will help solve their budgetary challenges by reducing the tremendous amounts they spend to treat smoking-caused disease under Medicaid and other state-funded health care programs."

While praising smoking prevention as a worthy goal, some economists disagree with the idea that smoking prevention saves states money — particularly states that have high cigarette taxes.

People who smoke don't live as long and, as a result, aren't as much of a burden on state finances as one might think. "On balance, all the states make money" from tobacco use, says W. Kip Viscusi, professor of law and economics at Harvard University.

Viscusi — author of *Smoke-Filled Rooms: A Postmortem on the Tobacco Deal* — also suggests that the effectiveness of smoking-prevention campaigns may be overstated. "Most of the states where they claim great success also have ratcheted up cigarette taxes as well," he says. "I've not seen a study that separates the two."

Viscusi agrees, however, that the states have broken their promise to use tobacco settlement money to improve public health. "The main rationale for getting all that money was to save the kids," he says. "Now that they have the money, no one's talking about the kids much."

Brown, the professor of agricultural economics at N.C. State, sees it the same way. "Smoking prevention is not the priority right now. The priorities are budget balancing and other things," he says. "States have a huge incentive to keep people smoking. If people stop smoking, the states would have no [tobacco] money."

If the states and the tobacco manufacturers were winking at each other all along, Maryland Gov. Parris Glendening must have missed the signal. In June 1999, he put out a press release outlining what Maryland would do with its tobacco settlement proceeds.

"I see this as an opportunity to take the tobacco industry's blood money and make Maryland a healthier state for everyone," he said.

That's pretty much what Maryland has done, says Carlessia Hussein, director of the state's Cigarette Restitution Fund Program. Forty percent of the state's settlement money has gone to cancer prevention, treatment, and research, while 31 percent is being spent on tobacco-prevention programs. Most of these dollars go to local coalitions that decide how to use them most effectively in their individual cities and counties.

Maryland has put 18 percent of its settlement money into substance-abuse programs, and 3 percent has been earmarked to treat tobacco-related diseases such as emphysema. Another 2 percent has flowed into a health care foundation that serves uninsured and underinsured residents.

Maryland is using 6 percent of the money to buy out tobacco farmers who agree to pursue other agricultural endeavors and legally encumber their land so that no one will ever be allowed to grow tobacco on it. Based on their average tobacco output between 1997 and 1999, Maryland pays participating farmers $1 per pound per year for 10 years.

Before the buyout, Maryland had 1,200 to 1,250 eligible tobacco farmers, and most of them have accepted the offer, says Pat McMillan, special assistant to Maryland's secretary of agriculture. The main exception has been the state's Amish farmers, who "have opted out of the program for religious reasons."

Maryland has used some of its tobacco settlement funds for Medicaid, and that helps balance the budget, Hussein admits. "But some would say that all the money should go back to Medicaid. Fortunately, our state hasn't seen it that way."

Not yet, but Maryland swore in a new governor in January, and he's facing a $1.6 billion budget deficit for 2004. And so far, he has played his tobacco cards very close to the vest.

"Certainly we're going to have some cuts," Hussein says, "but I feel sure that the new administration will see the value in what we are doing." **RF**

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To Tax or Not to Tax?

States Ponder New Ways to Collect Taxes on Online Sales

BY BETTY JOYCE NASH

Online transactions are still only a fraction of total retail sales — about 1.3 percent in 2002. But they are nevertheless at the center of a growing controversy: to tax or not to tax?

In February, several major retailers who sell online agreed to begin voluntary sales tax collections. The stores in question prefer to remain anonymous. The move likely started with stores that have ties to retailers with brick-and-mortar locations. The Supreme Court ruled, in 1967 and again in 1992, that out-of-state sellers without a physical presence in the state, or "nexus," as the Court called it, cannot be required to collect. But several large firms apparently began to suffer "nexus nerves" and agreed to pay the sales taxes. The firms will be forgiven any back taxes.

"I think it's certainly a good step forward," says Sabra Faires of the North Carolina Department of Revenue. "But make no mistake about it — they owe the money in those states, and they don't want to pay the back taxes."

The announcement comes at a time when retailers, legislators, and state officials are re-examining the idea of Internet taxation as a federal moratorium nears expiration in November of this year.

State officials and traditional retailers like the idea of the taxes — sales taxes, after all, make up a good chunk of states' general fund revenues, about 28 percent in North Carolina, for example. And times are tough right now. Most states need cash to close perilously large revenue shortfalls. There's also the idea of evening out the retail playing field for traditional brick-and-mortar merchants. But many on Capitol Hill say that electronic commerce should remain unfettered by the burden of collecting taxes, which can vary widely from state to state, county to county, city to city. There have been bills introduced in both chambers of the U.S. Congress that would extend indefinitely the current ban on taxes on Internet sales. The backer of one bill, Sen. Ron Wyden (D-Ore.), holds that taxing Internet sales could weaken the growing Internet economy.

While that idea has held sway thus far, the states, eyeing potential revenue sources, have come up with plans of their own, which they hope will ultimately serve as a blueprint when and if they get the OK to capture taxes on

goods sold in cyberspace. And, in fact, the effort did receive a symbolic boost in February when the retailers announced plans to collect.

Using simplification as a mantra, the "Streamlined Sales Tax Project" approved a multistate agreement in November, the culmination of more than a year's work by representatives from more than 40 states. Under the agreement, state legislatures will consider laws to help simplify collection of sales taxes. Fifth District states, including the District of Columbia, are considering proposals or forming study committees in support of the effort during this legislative session. Sabra Faires says the North Carolina State Legislature has additional work to do in the upcoming session to simplify sales tax rules even further.

"When the retailers sat in on the streamlined sales tax meetings, they said the differences in bases and caps and thresholds is what made it hard for them to pay up," she explains. "We've got quite a few differences." For example, the state does not tax food, but some localities tax food. "We do not have a uniform, local base." The state also has certain tax caps, for example an $80 cap on farm machinery. "[We need to] either tax it at the state rate or exempt it," she says.

"The hope is that taxes get simpler, and if [they] get simpler, retailers will collect," she says. What's more, the simplification could make a difference should the issue be challenged in court again or could inspire Congress to change the law, forcing retailers to collect.

"I think the fact that these large corporations are on board strengthens their [states] case," says Larry Walters, professor of public policy at George Mason University. But Walters says it isn't clear whether there is the political will to push simplification through the state legislatures.

In West Virginia, legislation has been introduced to end the aggressive bracketing system and adopt a rounding rule for the state's 6 percent sales tax, according to Dale Steager, general counsel for the West Virginia Department of Tax and Revenue. For example, a $1 purchase is taxed 6 cents, while a $1.01 purchase is taxed 7 cents, Steager says. Under the new rule, it would be rounded down to $1 and taxed accordingly.

The Mountain State is facing a $30 million deficit this year and a projected shortfall of $200 million next year. Policymakers would love to find a way to help put the state's books in the black, and some see taxing online sales as an attractive option. A study by Donald Bruce and William Fox of the University of Tennessee estimated West Virginia's lost e-commerce revenues at $70 million in 2001. "Our people think that is a high number," Steager notes. "But we don't really have the ability to come up with a more precise number."

Bruce says that, ultimately, Congress should redefine the concept of nexus. "You don't need a physical presence to conduct business," he says. "I think the states would like an economic definition."

Austan Goolsbee, an economist at the University of Chicago, has written a paper suggesting that people living in locales with high sales taxes are much more likely to buy goods online. Applying existing taxes could reduce the number of online buyers somewhere in the neighborhood of 15 percent, a number he revised downward in 2000 from 24 percent in 1999.

"Using an extensive data source of approximately 25,000 people with online access, the results suggest that local taxation plays an influential role in online commerce," he wrote in 1999. "Controlling for individual characteristics, people living in places with higher tax rates are significantly more likely to buy things over the Internet. … In total, the results give empirical support to the idea that taxes (and other price differences) will play an important role for individuals living in a 'world without borders,' and they motivate further empirical work on demand in an open economy such as the Internet."

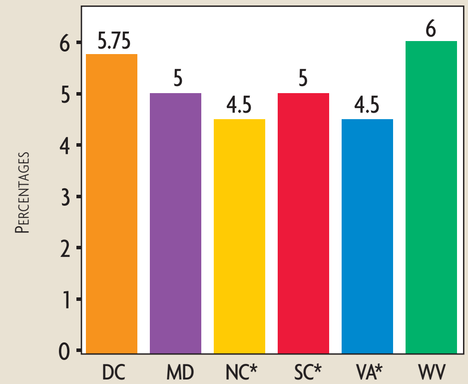
While the magnitude of the tax effect seems large, Bruce believes that the "infant industry argument" is dead —Internet sellers now have a strong presence in the market — and that local businesses are not being subsidized in the same way that the Internet industry's major players are. "Is there a public benefit to giving these companies a benefit that's not earned?"

Technically, consumers already owe taxes on goods they buy over the Internet. Typically a line on state income tax forms asks for a list of such purchases. But few pay this "use tax."

"The compliance level is virtually zero," says Bruce. "My sense is the revenue department would probably have a nice laugh if they got a check from somebody."

But it's important to note that consumer purchases represent only a small portion of electronic commerce. "In our study and in the real world, it's not just a retail question," Bruce says. "It's all transactions between businesses. More than nine of 10 dollars spent online is [through] business-to-business transactions. While we like to think business purchases are tax exempt, they aren't always." And states would love to cash in on that business. **RF**

State Sales Tax Rates in the Fifth District



*Allow localities to impose additional sales taxes

SOURCES: Federation of Tax Administrators, Sales Tax Clearinghouse, Inc.

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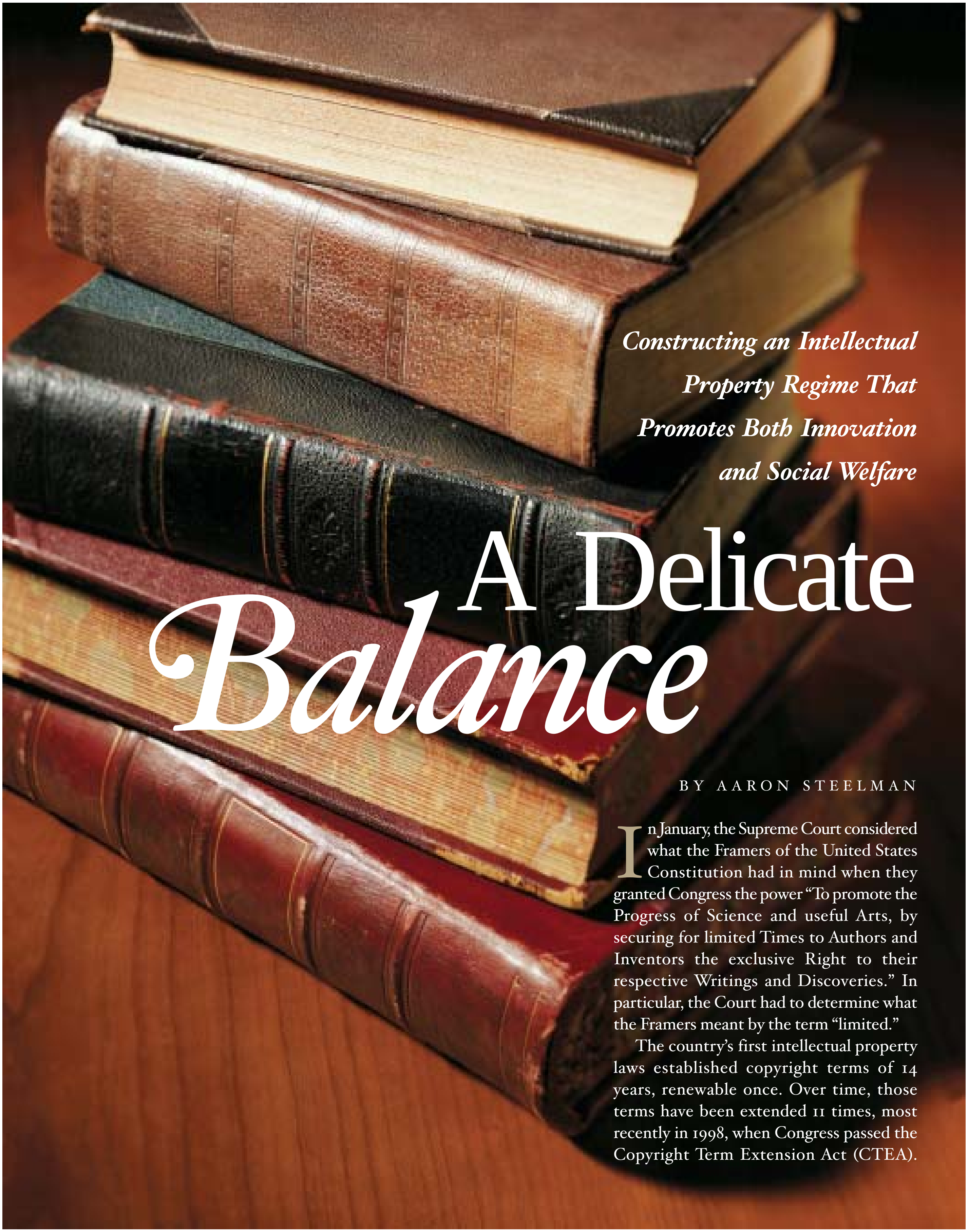


Constructing an Intellectual Property Regime That Promotes Both Innovation and Social Welfare

A Delicate *Balance*

BY AARON STEELMAN

In January, the Supreme Court considered what the Framers of the United States Constitution had in mind when they granted Congress the power "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." In particular, the Court had to determine what the Framers meant by the term "limited."

The country's first intellectual property laws established copyright terms of 14 years, renewable once. Over time, those terms have been extended 11 times, most recently in 1998, when Congress passed the Copyright Term Extension Act (CTEA).

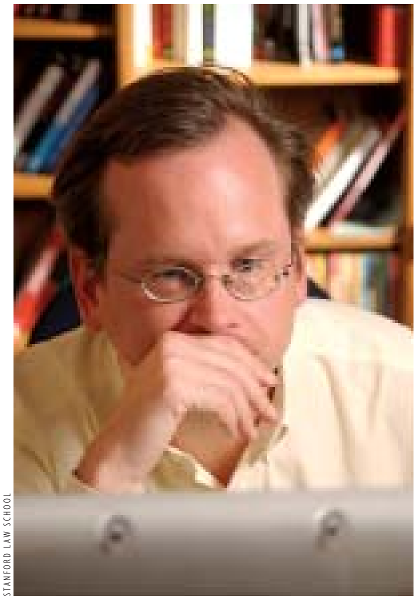
The CTEA, often called the "Sonny Bono Act" after the late congressman from California who championed the law, added 20 years to all copyright terms. That means copyrights are now protected for the lifetime of a work's creator plus 70 years following death, and copyrights held by corporations are good for 95 years. After a copyright expires, the property enters the "public domain."

Eric Eldred, a New Hampshire publisher who posts on his Web site literature that has entered the public domain, challenged the law, arguing that the CTEA sets terms that are neither "limited" nor necessary to promote the "Progress of Science and useful Arts." What it did instead, he claimed, was give an unfair monopoly grant to a few copyright holders at the expense of millions of potential consumers. In other words, Walt Disney Co. would benefit from the CTEA, because without copyright extension some of Disney's most famous images, such as Mickey Mouse, would have entered the public domain. But people who would like to read, say, an out-of-print but still copyrighted Robert Frost poem would be hurt, because Eldred and other online publishers would not be allowed to post it electronically.

The Supreme Court wasn't persuaded by the case presented by Eldred and his attorney, Lawrence Lessig of Stanford Law School. It upheld the CTEA by a vote of 7-2. But the issue of how to design an optimal intellectual property rights regime is still a pressing issue for economists and legal scholars.

"For as long as laws have aimed at protecting intellectual property, disputes have raged over which work to protect, for how long, and to what extent," write Stanley Besen and Leo Raskind in an introduction to a symposium on intellectual property published in the *Journal of Economic Perspectives*. And while economists may differ over the details, most agree in principle "that economic efficiency requires government support for innovative and creative activity."

There have been some notable dissenters, though. In 1934, the distinguished British economist Arnold Plant


STANFORD LAW SCHOOL

Stanford University law professor Lawrence Lessig argued before the Supreme Court that the Copyright Term Extension Act was unconstitutional.

argued against both copyright and patent protections. His case was straightforward: Economists generally oppose state grants of monopoly privilege, so why should intellectual property be any different? The "evils of monopoly," Plant maintained, extend to all spheres of economic activity, and "the science of economics as it stands today furnishes no basis of justification" for exceptions to that rule.

Many authors are not driven by profit, Plant argued, and thus copyright protection provides no incentive to them. It only drives up the cost of their works. "There is ... an important group of authors who desire simply free publication; they may welcome, but they certainly do not live in expectation of, direct monetary reward. Some of the most valuable literature that we possess has seen the light in this way. The writings of scientific and other academic authors have always bulked large in this class," he wrote. "For such writers copyright has few charms. Like public speakers who hope for a good Press, they welcome the spread of their ideas. Erasmus went to Basle in 1522, not apparently to expostulate with Frobenius for daring to print his manuscript writings, but to assist the printer in the good work. The wider the circulation, the more universal the recognition the author would receive."

Still, Plant did concede that more "authors write books because copyright exists, and a greater variety of books is published." However, "there are fewer copies of the books which people want to read." He advocated a gradual elimination of copyright protection. The first step would be to reduce the copyright term from the life of the author plus 25 years (the standard at the time Plant was writing) to five years after first publication. Such a change would help to "ensure low prices for books as early as possible after the fate of the first edition has revealed that a demand exists for them."

In the 1950s, economist Fritz Machlup, then of Johns Hopkins University, expressed ambivalence about the utility of the patent system. No one could "possibly state with certainty that the patent system, as it now operates, confers a net benefit or a net loss upon society," he stated. And if one does not know whether a system is good or bad, the safest policy "is to 'muddle through' — either with it, if one has lived long with it, or without it, if one has lived without it. If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it."

Similarly, Princeton University economist Robert Hurt registered his doubts about copyright protection in a 1966 article for the *American Economic Review*. The "traditional assumption that copyrights enhance the general welfare is at least subject to attack on theoretical grounds; the subject certainly deserves more investigation and less self-righteous moral defense."

Recently, economists Michele Boldrin of the University of Minnesota and David Levine of the University of California at Los Angeles have taken up this challenge and developed a model that they argue demonstrates that "current legislation on copyrights, licensing, and patents plays a harmful role in the innovation process." In addition to the example of the aspiring

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Richard Posner of the University of Chicago maintains that a system of "indefinitely renewable copyrights" would work more efficiently than the current regime.

author cited by Plant, they discuss basic scientific research, open source software development, and innovation in the fashion industry, all of which continue to proceed without intellectual property protection. Moreover, they question whether many musicians would stop composing, producing, and recording music should the copyright regime be eliminated. Some economists have argued that Boldrin and Levine's model makes unrealistic assumptions. Yet most agree it is a serious challenge to mainstream thinking on the law and economics of intellectual property. (For a nice discussion of Boldrin and Levine's paper and its critics, see Douglas Clement's article "Was Napster Right?" in the September 2002 issue of *The Region*, published by the Federal Reserve Bank of Minneapolis.)

And if there is one figure who could be said to represent such mainstream thinking it is Richard Posner, a lecturer at the University of Chicago Law School and judge on the U.S. Court of Appeals for the Seventh Circuit. Posner, along with his Chicago colleagues Ronald Coase, Richard Epstein, and William Landes, essentially founded the modern law and economics movement, which attempts to use the findings of social science to make the law more efficient.

To Posner, property rights are purely instrumental. They are valuable because, in general, they enhance social welfare. But when the cost of creating or enforcing a particular property right is especially high, he contends, that right should be withheld. Consider the extreme case of a hiker who has strayed from his course and is without food or shelter. If he stumbles along a vacant house and breaks in to save his life, in general the state will not prosecute him. The benefit of saving his life outweighs the cost inflicted on the property owner. Now consider a more mundane case: parking lots at shopping malls. Those lots are generally privately owned and the owners could, by right, charge people to park in them. But they usually don't. The reason: It is better for the shopping malls' merchants to effectively treat their parking lots as common pastures, because it encourages more people to visit their stores than if there were a fee to park.

Such a principle sometimes applies in the case of intellectual property too. Consider music. People often make tapes or burn compact discs of officially released music to give to their friends. Technically, this is a violation of copyright. But the music industry hasn't aggressively prosecuted people who engage in this practice. (The industry has, of course, gone after file-sharing Web sites that make such music available to literally millions of potential listeners, though.) The reason: The cost of prosecution is just too high. It is hard to track down all the unauthorized tapes and burned CDs out there. And, what's more, those tapes and burned CDs often create a following for an upstart band. The recipients may decide that they really like what they hear and go out and buy more of that band's official releases. Indeed, this is precisely what happened in the case of several "alternative rock" groups who played mainly on college campuses, before tape-swapping made them national figures. It also is true of J. R. R. Tolkien's brilliant trilogy, *The Lord of the Rings*. In the 1960s, when the books were acquiring cult status, especially in England, unauthorized copies made their way onto the market. Many enthralled readers eventually turned to the real deal and bought the authorized versions. Whether Tolkien, his estate, and his publisher were made better off by the distribution of illegal copies is unclear, but a good case could be made that they were.

Indeed, such examples have bolstered the arguments of people who wish to see intellectual property protections eliminated. One line of argument goes like this. The use of intellectual property — unlike physical property — does not reduce the value of its use by another. Put more formally, the marginal cost of intellectual property — the expense of adding one more user — is very low and can even be negative in certain cases. So why not make property available to anyone who wanted to use it, since optimal output is generally achieved by equating price to marginal cost? (A monopoly, in contrast, typically sets price above marginal cost, resulting in "too little" output.)

Posner acknowledges the charm of this argument. But he says that "such a policy would be disastrous." It would, he argues, "kill the incentive to create the intellectual property in the first place, outside of the relatively rare cases in which the creators have powerful nonmonetary incentives to create such property, or in which its creation is financed other than by sale or lease of the property (by taxation, for example, or charitable donation — such as the patronage of authors by wealthy people, in the old days.) We need not suppose that most creative people are greedy to realize that if they cannot obtain a pecuniary benefit from producing intellectual property, they will not be able to finance the costs (including the costs of their time) required to produce it."

Still, this does not mean that the duration of copyrights and patents should be boundless. There are many reasons why this is true. One of the more significant is the "tracing problem." Unlike physical property, intellectual property is not visibly distinct. It is relatively easy to say where one piece of land ends and another begins. But it is much harder to do the same with ideas. Ideas, by their very nature, build on one another in a cumulative process. Great writers, musicians, and scholars usually don't come up with their thoughts out of thin air. They are inspired and influenced by their predecessors.

Posner puts the tracing problem this way: "If copyright were perpetual, James Joyce or his publisher would have become embroiled in litigation with the heirs of Homer over whether *Ulysses* infringed *The Odyssey*, and Leonard Bernstein with the heirs of Ovid over whether *West Side Story* infringed Pyramus and Thisbe (not to mention *Romeo and Juliet* and *A Midsummer Night's Dream*, themselves arguably infringements of Ovid's story). If patents were perpetual, heirs of Leonardo da Vinci would be litigating over rights to basic aircraft technology."

Another reason to limit copyright protection is that doing so may increase the "distribution and hence use of intellectual property." Indeed, this is the crux of the argument made by Eldred and by 17 economists (including five Nobel laureates) who filed a "friend of the court" brief, arguing that the CTEA was economically inefficient.

Extending copyright by 20 years, the economists maintained, provides little incentive for the production of new works. The reason: The further away in time a royalty is paid, the less that payment is worth in present value. Consider the case of an author who writes a book and lives for 30 more years. Under the pre-CTEA copyright regime, "the author or his assignee would receive royalties for 80 years. If the interest rate is 7 percent, each dollar of royalties from year 80 has a present value of $0.0045. Under the CTEA, this same author will receive royalties for 100 years. Each dollar of royalties from year 100 has a present value of $0.0012."

What's more, extending copyright for existing works "makes no significant contribution to the author's economic incentive to create, since in this case the additional compensation was granted after the relevant investment had already been made." It does, however, provide a significant benefit to those copyright holders who can continue to make money from their intellectual property. But the number of such copyright holders is relatively small. Most of the intellectual property that would have entered the public domain in the absence of copyright extension is out of print. Indeed, according to Eldred's attorney, Lawrence Lessig, only 2 percent of the work copyrighted between 1923 and 1942 remains commercially viable. The other 98 percent presumably could have been posted on Web sites like Eldred's without harming anyone, except, perhaps, a few used book stores.

What can be done? The prescription offered by economists Boldrin and Levine is unlikely to be adopted. Intellectual property protection is here to stay. But are there ways to design a system that would improve overall welfare without drawing the ire of powerful media companies like Walt Disney and AOL Time Warner? Lessig has come up with a proposal that he thinks might fly. In an opinion piece for *The New York Times* he floated the following idea: Fifty years after a work's creation, copyright holders would be required to pay an annual tax to keep that work from entering the public domain. If the tax is not paid for three years in a row, then copyright protection would expire, and anyone "would then be free to build upon and cultivate that part of our culture as he sees fit."

The CTEA's major supporters shouldn't have any complaint about such a proposal, Lessig says. "All of them argued that they needed the term increased so they could continue to get revenue from their works that supported their other artistic endeavors. But if a work is not earning any commercial return, then the extension is pointless." This compromise would put fewer works into the public domain than if the Supreme Court had ruled the CTEA unconstitutional. "But it would nonetheless make available an extraordinary amount of material. If Congress is listening to the frustration that the Court's decision has created, this would be a simple and effective way for the First Branch to respond."

Lessig's proposal is very similar to one made by Posner. The major difference is the size of the tax involved. Lessig would keep it small, so that holders of copyrights to material that is not commercially viable could protect their intellectual property if they wished. Posner would make the tax high, so as to discourage such actions. But they agree that a politically feasible solution lies in a system of "indefinitely renewable copyrights."

At heart, the matter of intellectual property comes down to an issue of competing interests. On the one hand, we want to encourage innovation and artistic creation. On the other hand, we want as many people to have access to as much material as possible. The task is to create a legal regime that strikes the right balance.

And this, writes Posner, "requires a comparison of these benefits and costs — and really, it seems to me, nothing more. The problems are not conceptual; the concepts are straightforward. The problems are entirely empirical. They are problems of measurement." That may well be true. But such problems are not trivial. In fact, as Posner admits, they are "acute." Economists and legal scholars have their work cut out for them — but it is work that could yield huge societal benefits. **RF**

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Vernon Smith

Economic theory is based on several assumptions of how markets work and people behave. Vernon Smith has spent his career testing those assumptions in the laboratory. The result is the burgeoning field of "experimental economics."

Experimental economists observe people's actions in controlled environments to determine, among other things, how and why markets react to changes in legal and regulatory rules. The insights drawn from such simulated market transactions can be applied to a number of issues, including financial market theory, natural resource economics, and the deregulation of industry.

In 2001, Smith joined the faculty of George Mason University in Fairfax, Va., where he directs the Interdisciplinary Center for Economic Science (ICES). And last year, he and Daniel Kahneman of Princeton University were jointly awarded the Nobel Memorial Prize in Economic Sciences. This made Smith George Mason's second Nobel Prize economist: James Buchanan took home the award in 1986 for his pioneering work in the field of Public Choice economics.

Smith, 76, heads a team of seven researchers at ICES, all of whom came with him from the University of Arizona, where he taught for 25 years. Aaron Steelman interviewed Smith at the Federal Reserve Bank of Richmond on January 27, 2003.

RF: You majored in engineering in college. Why did you make the switch to economics?

Smith: When I was a senior at CalTech, I took an economics course and I got interested in the topic. I went to the library, and among other things, I ran across a copy of Paul Samuelson's *Foundations of Economic Analysis.* It looked to me a lot like physics, which I was already doing. I also subscribed to the *Quarterly Journal of Economics*, and in one of the first issues there was an article by Hollis Chenery on engineering production functions — so it was engineering too! Little did I know that that was a very unrepresentative issue of the journal. But, in general, the discipline was mathematical and had an important applied empirical dimension, which appealed to me.

I then went on to the University of Kansas, where I received my master's degree. One of my best teachers there was Richard Howey, who was an expert in the history of economic thought. I learned what deep scholarship was from him and developed an appreciation of where economics was coming from in the 18th and 19th centuries. From there, I went to Harvard, where I did my Ph.D. Among my teachers at Harvard was Gottfried Haberler, who warned us of the dangers of inflation. It was, as Joseph Schumpeter called it, "ze monster."

RF: In addition to changing disciplines, you also changed worldviews. You entered college as a socialist, right?

Smith: Yes, I grew up in a socialist family. My mother was a socialist and was very proud that she had cast her first vote for president for Eugene Victor Debs. I held many of those views also. But gradually, as I developed a deeper understanding of economics, I began to rethink things. And the final blow came when I started doing experiments and my subjects taught me that markets work. That transition took place over a number of years and became stronger and stronger. Certainly by the time I had been at Purdue for five or six years — this would be in the early 1960s — I had changed my mind.

RF: You had been on many economists' short list for the Nobel Prize for some time. Were you surprised to finally get the call last year?

GEEP SCHURMAN/FRB OF RICHMOND

Smith: I have been hearing rumors about the Nobel Prize for 20 years. In 1997, for instance, I was called by someone from Reuters, who told me that he had it on good authority that I would be awarded the prize that year, and it would be announced the following Sunday. I said, "Well, they don't announce the awards on Sunday." But clearly I had been getting some nominations since the early 1980s, and my friends all thought that I was poised to receive the prize. So, after a while, you get pretty thick skinned about it all and just try to do your work. The only thing that made this year any different was that in 2001 the committee had a symposium on experimental economics in Stockholm. They invited 12 of us to be the main speakers and 12 people to discuss those papers. There was speculation they were going to pick somebody out of that group, but we couldn't be sure who it was or if it would be multiple people.

RF: George Mason University has a reputation for being a haven for free-market academics. What, in your view, has contributed to the development of this relatively unique intellectual environment?

Smith: I don't know that much about the history of George Mason. But I think a pretty crucial factor was that they were able to attract Jim Buchanan, who, in turn, attracted other Public Choice economists to the faculty and graduate students who wanted to work with them. In addition, they have a number of excellent Austrian School economists who have strong free-market views. Also, I think the administration realized that they couldn't be like Harvard, Yale, Chicago, and other major research universities. So they needed to find a niche to become well known. But I really can't give you a complete answer to that question. The topic would make for an interesting historical study.

RF: When you came to George Mason, you brought several faculty members from the University of Arizona along with you. In a way, this isn't surprising: Many academics benefit from working with colleagues with similar interests. But is this particularly true in the case of experimental economics? Is there something about the nuts and bolts of actually doing the experiments that requires a core group of researchers?

Smith: Many contributions to economics are made by lone wolves. That is, there are an awful lot of papers with single authors, much more so than in the hard sciences. For instance, you can find papers in *Science* and *Nature* that will have 100 authors. I think experimental economics lends itself far more to that type of approach. Certainly, it's always helpful if you have a certain mass of people to talk to, but here the actual problems of covering the operations and doing the work require multiple skills that often aren't embodied in one person. I feel that a really important part of my development with experimental economics occurred when I was no longer working alone. That started in the 1970s with Charlie Plott, Ross Miller, and other people at CalTech. And by the time I arrived at the University of Arizona in 1975, most of the efforts were joint.

RF: How was your work received by the profession when you first started conducting experiments?

We have examples where people don't do as well as rational models predict. We have examples where they do better. And we are trying to understand why.

Smith: Not particularly well. I first started giving seminars in the late 1950s and early 1960s, and at the time people didn't know what I was doing or why I was doing it. It didn't look like economics to them. But I found it very interesting and exciting, and I was careful enough to do other things in the meantime to get promoted.

RF: Tell us about the relationship between experimental economics and public policy.

Smith: I should say that we don't set out to do policy research or to answer policy questions. We're interested in the performance and function of markets, and that often gets you into policy questions.

The first problem that we addressed, after we got into computerized experiments, was the question of how you might design a market for airport access rights. In the late 1970s, the deregulation of the airline industry began. This involved the routes that airlines could fly and the prices they could charge. But nobody was thinking about the airports, where, of course, airplanes have to land and take off. If access to the airports were going to continue to be allocated by some bureaucratic organization, then the airline industry in a sense wasn't really being deregulated.

Take-off and landing slots are a commodity that have greater value in packages than in singles, because for every take-off, you have to have a landing, and the flight schedules need to be compatible. We saw this early on as a combinatorial problem. So we designed an auction mechanism to try to solve this problem and tested it in the laboratory. Much later, of course, combinatorial auctions became of interest to people who were thinking about how to allocate rights to the electromagnetic spectrum.

RF: Your Nobel lecture seemed to draw heavily upon the work of F. A. Hayek, especially his ideas about rationality. Briefly talk about the difference between "constructivist rationality" and what you have termed "ecological rationality."

Smith: Economic theory is dominated by constructivist models, involving optimal knowledge for individuals, equilibrium in markets, and efficiency. But what we observe in experiments and the real world is often different: people's knowledge is incomplete, and they may not have any idea what it means to talk about equilibrium and supply and demand. Remarkably, though, the first time I got people together in the lab, the market they formed converged toward a competitive equilibrium. And I think that the history of experimental economics is, to some extent, the story of people achieving these outcomes that are unintended and unknown to them. This type of knowledge is what I call "ecological rationality." It may or may not correspond to the rational model that constructivism posits. We have examples where people don't do as well as rational models predict. We have examples where they do better. And we are trying to understand why.

All of our work is driven by the notion that information is fundamentally asymmetric, dispersed, not knowable by any one person or group — and that it is the guy out there with the knowledge who needs to be motivated to reveal what is necessary to make the system efficient. And this, of course, is very close to what Hayek argued. Hayek was incredibly good at the abstract level, but people read him and have a hard time relating to him because there are few concrete examples. In fact, I became influenced by Hayek only recently, and I now see certain themes that could integrate a lot of the work in experimental economics. My Nobel lecture was sort of the beginning of that project.

RF: What do you see as the relationship between game theory and experimental economics?

Smith: There has been a lot of experimental economics research concerned with testing propositions from game theory. When it works, game theorists love it. When it doesn't work, they have a tendency to say that there is something wrong with the experiments. So we make some modifications to try to explain those anomalies — for instance, why Dutch auction prices are lower than first-price sealed-bid auction prices, though game theory predicts that they are identical. We had two models, and one did a much better job of explaining it than the other one. So I guess the answer is, we have to do it ourselves. I would like to see a little more division of labor. They are the experts in game theory, after all.

But, recently, we have collaborated with some sympathetic game theorists, and it turns out that they are the very best in their field. John Ledyard at CalTech and David Kreps and Bob Wilson at Stanford have been very sympathetic. Wilson has even tackled the very important and difficult issue of doing a game-theoretic analysis of the double auction. It takes someone like Bob to pass up the temptation of picking all the low apples and going for a high one instead. And in his paper he points out the very serious limitations of his own results and that the limitations are inherent in the game-theoretic framework. It takes great courage, honesty, and intelligence to make such a claim.

RF: There is an emerging school of thought called "behavioral finance," according to which investors display certain predictable cognitive biases that can lead to significant deviations between the behavior of actual markets and the predictions of models with frictionless markets. Some even say that these biases can explain dramatic stock market runups like we had in the late 1990s. Does your experimental work shed light on this issue?

Smith: The explanations of the behavioral finance theorists are certainly possible. But I'm not prepared to say that these markets or their participants are irrational. And, by the way, neither is Daniel Kahneman. As far as Danny is concerned, that's the behavior and he's just reporting it. He doesn't really make a judgment.

One of the reasons I'm not prepared to call this behavior irrational is that, while it may not be good for the individual, it may be good for society as a whole. Maybe we are programmed to do some very risky things in an effort to get back in the game — and, in so doing, that behavior may produce benefits for society. We know that people tend to throw money at innovations and new entrants to the market, and so we have people bidding up the price of companies with no net profits. Many, maybe most, of those companies will fail. But a few will survive and throw off huge benefits for the economy, benefits that far exceed the money that was spent to get them off the ground. Consider the steam engine. It produced the steam ship and the locomotive, which were big drivers of reducing transaction costs and increasing the speed of things. We spanned a continent with rail in very little time. Well, many individual investors lost money, but there was long-term value created. The 19th century was an incredible growth century. And for all I know this risky, speculative behavior is the cost of that kind of growth. If I had a formula to protect individuals from their own tomfoolery, it would not necessarily be best for society. I can't be sure of that.

RF: Some observers have described your experimental work as showing that markets often misfunction, because in experiments prices often deviate from "fundamental" values. Others say your work is broadly supportive of the efficiency of market mechanisms, because prices exhibit a strong tendency to clear the market. Which is it: Do markets work well or do they often misfunction?

Smith: I distinguish between consumer markets and asset markets. With the asset markets, we often get bubbles and crashes in the laboratory, but the consumer markets tend to converge quickly. The asset markets eventually get there also, but it takes longer. We sometimes have to bring subjects back three times before they will quit trading away from fundamental value. So there is confirmation of ultimate fundamental value trading, but under conditions that are hard to imagine actually occurring, except for very stable companies. The distinction between consumer markets and asset markets is very important. If people don't make that distinction, they can get confused about what my work shows.

RF: What do you think is the most pressing issue in economics today?

Smith: I think economists' work is still colored too much by their political preferences. You know, Hayek once wrote a paper called "Why I Am Not a Conservative." I sometimes would like to write a paper about why I'm not a conservative or a liberal or a libertarian, so that I could state what I think the problems are with all of them.

It's important for economists to understand the phenomena they are studying before they start asking what can be done about it. And it seems to me that a lot of people are afraid of getting certain empirical results because of the implications it might have for the policies they favor. You see this in particular in the resistance to even the slightest suggestion that some of our behavior may have an inherited component. You have people like Steve Pinker who are talking about both the environment and heredity, and yet they are accused of being genetic determinists, when of course the alternative is just plain environmental determinism. It amazes me how much people are still arguing over nature versus nurture, when it seems clear to me that it's both.

RF: Some economists have done tremendous technical work but have not been particularly interested in reaching people outside the profession. Others have had the desire — and, perhaps more importantly, the skill — to do high-quality work and make it accessible for lay audiences. What, in your view, should be the role between the economist and the public?

Smith: I think every economist should ask himself the brother-in-law test: Can I explain to my brother-in-law, who is in a completely different field, what it is that I do for a living? The physicists try to do this. Some are better than others, but they try to explain what is implied by quantum physics or by relativity. And over the years, I think their ways of explaining these issues have improved.

There are an awful lot of people out there who don't have a lot of education but who are smart and want to know things. For example, my parents had an eighth-grade education, but they were always curious. We ought to try to reach these people. **RF**

Vernon Smith

➤ Present Position
Professor of Law and Economics, George Mason University

➤ Previous Faculty Appointments
University of Arizona, California Institute of Technology, University of Massachusetts, Brown University, Purdue University

➤ Education
B.S.E.E., California Institute of Technology (1949); M.A., University of Kansas (1952); Ph.D., Harvard University (1955)

➤ Awards and Honorary Positions
Co-winner, 2002 Nobel Memorial Prize in Economic Sciences; Distinguished Fellow, American Economic Association; Fellow, American Academy of Arts and Sciences

➤ Selected Publications
Author of more than 200 articles in scholarly journals, some of which are collected in *Bargaining and Market Behavior: Essays in Experimental Economics* (New York: Cambridge University Press, 2000)

GEEP SCHURMAN/FRB OF RICHMOND

Story of a Port Town

The Evolving Economic Role of Baltimore's Waterfront and Location

BY CHARLES GERENA

By American standards, Baltimore is an ancient city. Its storied history stretches back to colonial days, when its port began to ship farm goods from the mid-Atlantic to people around the globe.

During the Revolutionary War, for instance, American soldiers "were fed by the grain and flour delivered from Baltimore," describes Geoffrey Footner, a Baltimore-based author and maritime historian. Goods also were shipped from the city to France, where they were transported to the Dutch Islands and traded for weapons and gunpowder needed by the Continental Army.

This is just one of many instances of how Baltimore's economic life has been shaped by armed conflict. More importantly, it illustrates how the city's waterfront and location have been central to its growth and prosperity — a fact that continues to this day.

The history of Baltimore's harbor, shown here in 1910, stretches back to colonial days.

VANE BROTHERS COMPANY

The city was founded as Baltimore Town in 1729. Its 60 acres surrounded one of the harbors formed by the Patapsco River, which flows eastward into the Chesapeake Bay. Towns emerged at other harbors as well, including Jones Town in 1732 and Fells Point in 1763. (By 1773, the three towns had merged to form the city of Baltimore.)

Baltimore's founders saw the potential for a port. The harbor could access Atlantic trade routes via the Chesapeake Bay, yet it was better protected than Norfolk, Va., and other Bay ports because it was farther inland. Although the harbor was shallower and harder to navigate than Fells Point, the problem was dealt with by constructing piers that reached into friendlier waters.

At the same time, Baltimore's harbor was close to sources of food production. Down the Chesapeake Bay were communities where the land was fertile and the water teemed with seafood. Farmers in Pennsylvania, Delaware, and western Maryland were nearby as well.

Finally, Baltimore was on the "fall line," a geological transition between the hard rock of the Piedmont and the softer soil of the Coastal Plains. When the Patapsco or any river or stream flows over this ridge, it creates falls and rapids that impede water travel. As a result, Baltimore's harbor was a good place to offload goods from ships and transport them inland using other means of transportation.

All Baltimore needed were markets to serve. During the 17th and early 18th centuries, Maryland had no pressing need for a major trade center. "The initial trade…was in tobacco, and it was controlled in London," says John McCusker, professor of American history and economics at Trinity University. Also, historians note that tobacco plantations mostly used their own docks or utilized ports that were close to the mouth of the Bay, such as Norfolk or St. Marys in southern Maryland.

Baltimore found its market niche when tobacco prices collapsed and it became more expensive to cultivate the golden leaf in the early 18th century. Tobacco farmers began seeking more profitable crops to grow. "They discovered that their land better produced grains than tobacco, and a market grew for the former," says McCusker. "That gave rise to local merchants who organized the grain trade and the exchange of other goods to farmers."

Demand for corn and wheat came from Europe and Caribbean nations where French, British, and Swedish plantations operated. "Sugar was such a profitable crop that it was economically disadvantageous for the plantations ... to grow their own food. They bought food from someplace else," explains Matthew Crenson, a political science professor at Johns Hopkins University who has studied Baltimore's social and economic progress for three decades.

Baltimore took advantage of the growing grain trade. Not only did it offer access to local grain farmers, but it had streams like Jones Falls and Gwynns Falls that flowed downhill into the harbor. This provided plenty of waterpower for grinding wheat and corn into flour, which traveled better than raw grains.

"Wheat came in wagons from western Maryland and Pennsylvania into Baltimore where the mills ground it into flour," describes Crenson. Other accounts describe shipments of produce coming into Baltimore, produced by farmers who were settling and developing Maryland's "backcountry" in the northern and western part of the state. Wharves, warehouses, and shipyards arose along the waterfront of Baltimore Town and Fells Point to handle these commodities.

Despite this growth, other colonial ports matured faster than Baltimore did. "You didn't have to sail the whole way into the Chesapeake Bay like you do to get to Baltimore," notes John Kellett, director of the Baltimore Maritime Museum. The distance between Baltimore and the mouth of the Bay in Norfolk is about 150 miles, "and back in the days of sailing that was pretty long." Also, Kellett says the wind currents could be "fluky," adding days to a voyage.

AIRLAND-INDUSTRIAL PHOTO CO.

The Maryland Port Administration has geared the Port of Baltimore to serve certain niches in container transport, including automobiles. Today, the Port is the top East Coast exporter of vehicles.

Distance and wind currents became irrelevant when the American Revolution erupted in 1775. While the British shut down the Bay's outer ports and occupied centers of commerce like Philadelphia, Baltimore managed to stay out of the clutches of the redcoats and keep the goods flowing, partly by using homegrown, locally owned clipper ships. Food and supplies reached revolutionaries to the north and south of Baltimore, while flour and other goods continued into Caribbean markets.

"The War of Independence ... proved to be a boon for Baltimore merchants, not only because rival ports were more effectively blockaded by the British but because Spanish ports in the Caribbean, normally closed to American shipping and flour, were opened for the war's duration," wrote economist Geoffrey Gilbert in a 1977 journal article. "In the post-war period, Baltimore's flour trade to Europe and the West Indies showed rapid gains." By the 1790s, the city commanded 26 percent of America's flour exports to the West Indies, where the major ports of entry for the Caribbean were based.

As more flour moved out of Baltimore, more capital flowed into the city. "Much of the early commercial development [in Baltimore] was underwritten by Philadelphia merchants," says McCusker. Then Maryland businessmen jumped on the bandwagon.

This capital financed the development of a variety of support industries in Baltimore. Shipbuilding at Fells Point expanded, while ironworks cranked out fittings for ships and parts for mills.

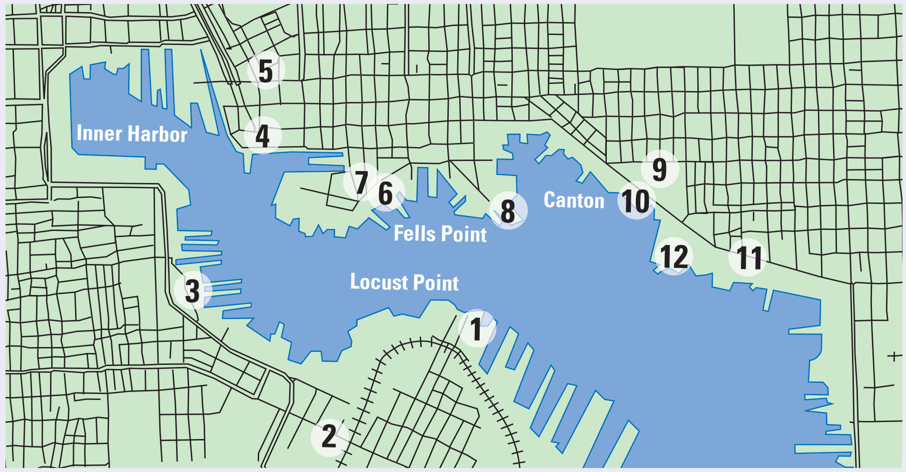
Additionally, goods started coming from Caribbean plantations back to Baltimore. They included sugar, coffee, and a distinctive commodity called guano — dried bird and bat excrement that tobacco and cotton plantations used as fertilizer. The need to store these commodities spurred the construction of more warehouses.

Baltimore was an established port town by the turn of the 19th century, often benefiting from turmoil abroad according to historical geographer Sherry Olson. "Of great importance to Baltimore were the perennial naval warfare between England and France, which drove up flour prices, and the frequent changes in management in the sugar islands of the West Indies, major importers of wheat," Olson noted in her 1997 book on the city's history. "Baltimore merchants profited from the interruption of European shipping and exploited the ups and downs in the price of flour."

New York merchants viewed the progress of their Southern competitor with envy. Baltimore had a strong grain trade with overseas markets and was in a good position to increase its domestic trade because it was

Baltimore's Waterfront Continues to Change

The Inner Harbor was where Baltimore began to redevelop its waterfront in the 1970s and 1980s. Since then, developers have seen value in the harbor views and unique structures of Canton, Fells Point, and other waterfront communities. Here is a sample of the many industrial buildings that have found new life or have been razed to make way for new retail, office, and residential development.



1. Tide Point—Proctor & Gamble soap factory turned into an office complex for technology and service firms

2. Phillips Foods Inc.—Coca-Cola plant redeveloped into office and production space for the seafood manufacturer

3. HarborView—Luxury condominiums and apartment homes

4. Inner Harbor East—20-acre, mixed-use development includes two Marriott hotels, Sylvan Learning Centers headquarters, a luxury apartment building, and a planned entertainment complex

5. Bagby Furniture Building—Conversion of warehouse into Class-A office space

6. Bond Street Wharf—Class-A office complex built on site of warehouse

7. Brown's Wharf—Renovation of coffee warehouse to house offices and specialty retail

8. Henderson's Wharf—Renovation of tobacco warehouse into a residential complex, inn, and marina

9. The Can Company—American Can Co. plant converted into a retail and office center

10. The Anchorage—Luxury condominiums built near waterfront for marina access

11. Canton Cove—Redevelopment of factory into luxury condominiums

12. Lighthouse Point—Licorice factory renovated into a 16-acre development with apartments, retail and office space, and a marina

—Charles Gerena

geographically closer to Ohio and other Midwestern markets than New York. In addition, the city stood to gain a major transportation advantage from the National Road, a federal project begun in 1815 to link Cumberland in northwestern Maryland to St. Louis. Maryland officials promised to link Baltimore to Cumberland by expanding several state roads.

New York countered Baltimore's geographic advantage by completing the Erie Canal between the Empire State and Lake Erie in 1825. The 360-mile canal transported East Coast goods to Midwest customers more quickly than Baltimore could by using the National Road, which only reached Wheeling, W.Va., at the time. That meant shipments from Baltimore had to be offloaded onto ships to finish their journey on the Ohio River. Even when the National Road was finished in 1833, the older portion was in poor condition.

The Erie Canal threatened Baltimore's dominance in another way. It enabled Midwest agricultural goods to reach East Coast markets. This eroded demand for grains and produce from Chesapeake Bay farmers, which were major users of Baltimore's port.

After several failed attempts to build a canal system, a group of Baltimore merchants and bankers formed a committee to find a way for the city to boost its Midwest trade. They boldly determined that a railroad would be the best way to compete with the Erie Canal, since it would be faster and cheaper to maintain than the National Road.

The Baltimore and Ohio Railroad was chartered in 1827 and took about 30 years to finish, creating the country's first public railroad that linked Baltimore to St. Louis. Others developed rail links to Baltimore, including the state's Western Maryland Railway and countless small enterprises.

Although the railroads ultimately brought more competition for Chesapeake farmers, it enabled Baltimore to reap the benefits of its port and location throughout the 19th century. Warehouses in Canton, Fells Point, and other waterfront neighborhoods were built to pack seafood and produce for shipping, while container manufacturers such as the American Can Co. were established to support this activity. Bakeries opened to take advantage of the plentiful supply of flour. Coal could be delivered to Baltimore cheaply, supporting the growth of industrial production.

"Baltimore evolved from being the link between the agrarian world and the markets of Europe, to being a manufacturing town," notes Kellett of the Maritime Museum.

By 1860, Baltimore was the nation's fourth-largest city and a commercial hub for the South. But the city would soon taste the bitter side of war.

A month after a mob attacked a Massachusetts regiment headed to Washington, D.C., to protect it from invasion, federal troops entered Baltimore in 1861 and declared martial law. Their occupation persisted until the end of the Civil War four years later.

The war severely damaged Baltimore's economy. "Suspension of communication with Southern customers, and the liability of capture and repeated interruptions in Western trade, almost paralyzed Baltimore's commerce ... and resulted in its diversion to other cities," wrote Pearle Blood in a 1937 journal article. "South American imports, which had been carried chiefly in Baltimore-owned sailing vessels, were transferred to foreign ships" to avoid plundering by Confederate troops.

While Pittsburgh and other cities farther away from the fighting developed their industrial muscle, Baltimore industry atrophied. Its only growth sectors were tied to the railroad or the port, both of which served as strategic transit lines for Union supplies and troops.

Baltimore's economy continued to feel the effects of the Civil War long after the conflict had ended. Plantations lost the economic efficiencies of slave labor, increasing the cost of farming and reducing the flow of agricultural goods through the city. Worse, local investors were less willing to bet their capital on the city's industrial sector, discouraged by the loss of the city's comparative advantage in manufacturing.

"Firms in Baltimore couldn't raise money through the sale of stock [so] they had smaller work forces," describes Johns Hopkins' Crenson. "The per-worker investment in machinery was lower than it was in other cities, which indicated that Baltimore wasn't keeping up technologically. The result was that Baltimore industry didn't grow as rapidly as it did elsewhere in the post-Civil War period."

Baltimore entered a prolonged period of redeveloping the value of its water access and geography that lasted throughout the 20th century.

Broader changes in the transportation industry added to the challenge. The construction of the interstate highway system provided a better way of moving goods and people than the railroad, undermining the advantages that Baltimore's rail links had once afforded. The development of refrigerated trucks meant that warehouses and packaging facilities no longer had to locate close to the source of production. These operations gradually relocated from Baltimore, moving wherever trucking was available and other economic conditions were more favorable.

The city began losing general cargo traffic to New York after World War II, mainly because its port facilities weren't up to date. "... The railroads were unwilling to make room for the developing truck traffic that was changing the face of American transportation," noted Robert Keith in his 1982 chronicle of Baltimore. Moreover, the thin peninsulas protruding into the harbor were great for offloading cargo onto trains, but created bottlenecks for trucks. Finally, "piers were reaching a state of decay, and the railroads were neither willing nor able to maintain them."

Government officials have tried to adapt Baltimore's waterfront to changing times. As ships grew larger to carry more cargo and accommodate vessel-sharing agreements among carriers, city and federal funds were deployed several times to deepen and widen the port's harbors and channels. The state's Maryland Port Administration (MPA) took over operation of most of Baltimore's maritime facilities in 1956 to make much-needed improvements. Three years later, the MPA started building Dundalk Marine Terminal on the southern edge of the city's waterfront to accommodate truck-borne cargoes. Across from Dundalk, it devoted $30 million to upgrade the railroad piers in Locust Point in 1964.

In subsequent years, the MPA geared the Port of Baltimore to serve certain niches in container transport, including forest products and rolling cargo such as automobiles and farm equipment. Baltimore has become the top East Coast exporter of vehicles and third in the nation for total car trade. In the past 10 years, more than 3.5 million vehicles have rolled through Baltimore.

Meanwhile, port activity gradually migrated from the shallower Inner Harbor to Canton and points farther south where the water is deeper, leaving behind empty warehouses and industrial sites. Urban renewal efforts in the 1970s and 1980s brought retail projects and museums to the Inner Harbor, while commercial and residential developers recognized the value of other sites along Baltimore's waterfront in the 1990s (see sidebar on p. 38).

Today, the city's water-based economy continues to evolve from shipping and factories to services and recreation. "The success of the Inner Harbor has begun to spread, particularly to the east towards Fells Point," describes Walter Sondheim Jr., a Baltimorean who has been involved in waterfront redevelopment since 1970. "The waterfront has become a center for commercial activity, particularly for office space and hotels."

However, Baltimore's historic harbor may only be succeeding in refocusing economic activity in the city. Development of a services sector along the waterfront "has created vacancies in the financial district downtown," admits Sondheim. Some of this space is beginning to be redeveloped, however, benefiting from downtown's proximity to the waterfront. Also, income levels are higher for residents who live by the water compared to other neighborhoods.

Sondheim argues that there are ways to spread around that growth. "Some of the tax revenues produced by the Inner Harbor finds its way into neighborhood development," he notes. As new waterfront development increases the property tax base and attracts tourism dollars, the economic role of Baltimore's harbor will continue to evolve. **RF**

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District Economic

BY ROBERT LACY

Apprehension about terrorism and political developments regarding Iraq cast a pall over the Fifth District economy in the last three months of 2002. Many businesses continued to place investment plans on hold in light of the uncertainty of potential military conflict. Consumers were out in force during the holiday season, but sales were disappointing for most retailers.

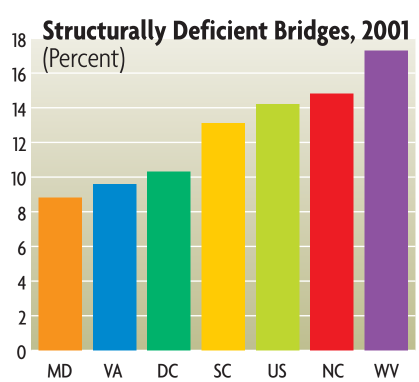
> **Did You Know. . .**
>
> **Fourteen percent of the highway bridges in the country are considered structurally deficient. The Federal Highway Administration considers a bridge structurally deficient if it has been restricted to light vehicle traffic, requires immediate rehabilitation to remain open, or is closed. Among Fifth District states, Maryland has the lowest percentage of deficient bridges, while West Virginia has the highest.**

Economic growth in the Fifth District slowed substantially in the fourth quarter of 2002. Retailers tell us that holiday season sales were lackluster — if not for upbeat postholiday sales, December would have been dismal for many District retailers. Manufacturers had some good news: new orders trended higher during the quarter. But they said that shipments were generally flat and noted that employment continued to decline.

Economic Anxiety

Participants in our monthly survey of retailers and services businesses reported that revenues declined in the fourth quarter of 2002. Retail revenues were particularly weak — shopper traffic in District stores was generally light, and merchants tell us that shoppers shied away from big-ticket purchases. Retailers continued to trim payrolls. In fact, retail employment in the Fifth District is at its lowest level in three years. Services sector jobs also declined, albeit at a slower pace than in retail.

District manufacturers managed to keep their heads above water in the fourth quarter, despite sagging consumer demand and heated competition from foreign producers. New orders picked up in the fall and shipments leveled off after slipping in late summer. But manufacturing employment continued to fall — 19,000 jobs were lost during the fourth quarter — and some manufacturers believed the sector remained in recession. "Things are very flat right now; some new glimmers of work coming ... but this recession has been long," according to a plastics manufacturer in North Carolina.



Government Sector Buoyant

Bucking the trend in total employment, government employment in Fifth District states was 1.5 percent higher in the fourth quarter compared to a year ago. It's a huge sector, accounting for 19 percent of total nonfarm employment in the Fifth District, swelled by the large number of federal employees in and around Washington, D.C.

It's also a diverse sector, and trends in local, state, and federal government employment have diverged. Local government employment growth has been fairly steady at around 2 to 3 percent over the last three years. State employment, meanwhile, has declined as states have wrestled with revenue shortfalls. Federal government employment, which fell throughout 2001, showed modest growth by the end of 2002.

Unemployment Rates Steady

The unemployment rate in the Fifth District stood at 5.1 percent in the fourth quarter of 2002. This rate was little changed from the third quarter of 2002 and was 0.2 percentage points below the level of a year ago.

The Fifth District's current unemployment rate is almost a full percentage point below the U.S. rate of 5.9 percent. Unemployment rates in Maryland and Virginia, at around 4 percent, are among the lowest in the country.

The unemployment rates in West Virginia and D.C. are now just above the national rate. But both of these jurisdictions have seen their unemployment rate converge to the national rate, after remaining well above the national average in the late 1990s.

Personal Income Growth Picks Up

Third-quarter personal income in the Fifth District was 3.7 percent higher than a year ago. This rate was faster than in the first half of 2002, but slower than the exceptional growth recorded in the late 1990s. Personal income growth in Maryland and the District of Columbia exceeded 4 percent in the third quarter.

Developments

Nonfarm Employment
Fourth Quarter 2002

	Employment (Thousands)	% Change (Year Ago)
DC	650	0.1
MD	2,473	0.1
NC	3,881	-0.1
SC	1,832	-0.1
VA	3,497	-0.2
WV	727	-0.9
5th District	13,060	-0.1
US	130,806	-0.2

Unemployment Rate
Percent

	4th Qtr. 2002	4th Qtr. 2001
DC	6.3	6.6
MD	4.0	4.4
NC	6.2	6.4
SC	6.0	6.0
VA	3.9	4.4
WV	6.0	4.6
5th District	5.1	5.3
US	5.9	5.6

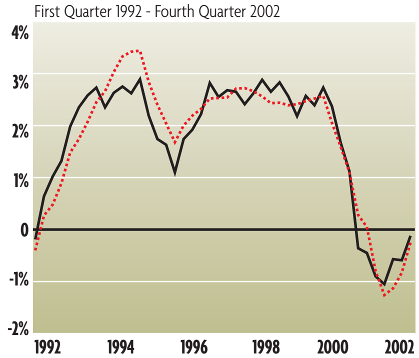
Personal Income
Third Quarter 2002

	Income ($ billions)	% Change (Year Ago)
DC	24.0	4.4
MD	198.1	4.3
NC	233.2	3.6
SC	105.1	3.5
VA	241.4	3.5
WV	42.8	3.3
5th District	844.6	3.7
US	8,984.2	3.3

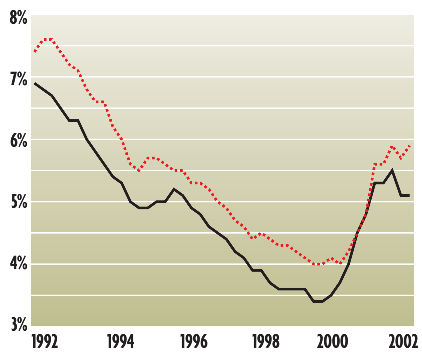
Fifth District **United States**

Nonfarm Employment
Change From Prior Year

First Quarter 1992 - Fourth Quarter 2002

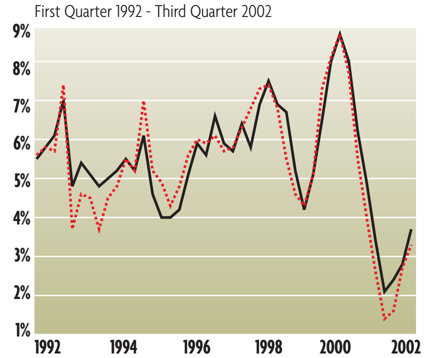


Unemployment Rate
First Quarter 1992 - Fourth Quarter 2002

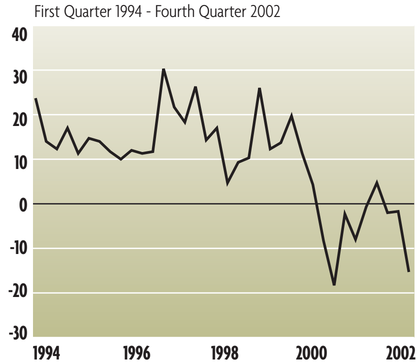


Personal Income
Change From Prior Year

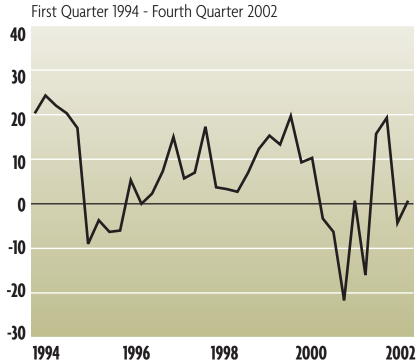
First Quarter 1992 - Third Quarter 2002



FRB—Richmond Services Revenues Index
First Quarter 1994 - Fourth Quarter 2002

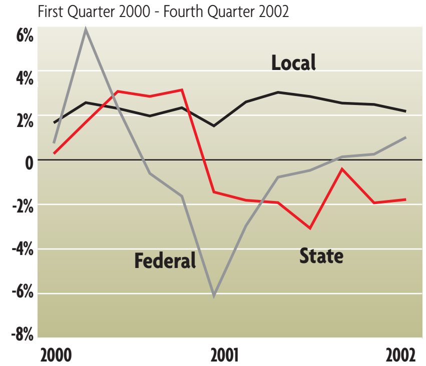


FRB—Richmond Manufacturing Shipments Index
First Quarter 1994 - Fourth Quarter 2002



Fifth District Government Employment
Change From Prior Year

First Quarter 2000 - Fourth Quarter 2002



NOTES:
1) All data series are seasonally adjusted.
2) FRB-Richmond survey indexes are diffusion indexes. Positive numbers represent expansion, negative numbers contraction.
3) State nonfarm employment estimates are based on surveys of establishments. These employment figures differ from those used to calculate state unemployment rates.

SOURCES:
Income: Bureau of Economic Analysis, U.S. Department of Commerce, http://www.bea.doc.gov
Unemployment rate: LAUS Program, Bureau of Labor Statistics, U.S. Department of Labor, http://stats.bls.gov
Employment: CES Survey, Bureau of Labor Statistics, U.S. Department of Labor, http://stats.bls.gov

For more information, contact Robert Lacy at 804-697-8703 or e-mail Robert.Lacy@rich.frb.org.

DISTRICT OF COLUMBIA

BY ANDREA HOLLAND

Over time, personal income and gross state product (GSP) tend to track fairly closely. But data on personal income are available well before information on GSP. Personal income data are released on a quarterly basis (with a two-quarter lag), while GSP data are released on an annual basis (with a two-year lag). Consequently, analysts often rely on personal income to estimate a state's recent economic activity.

Third-quarter real personal income data show that the District of Columbia's economy was strengthening late last year. In fact, the rise in the third quarter capped off 12 consecutive months of income growth in the jurisdiction.

Overall, personal income in the District of Columbia grew by 0.8 percent in the third quarter of 2002. By category, net earnings and transfer payments expanded, while dividends, interest, and rental income contracted.

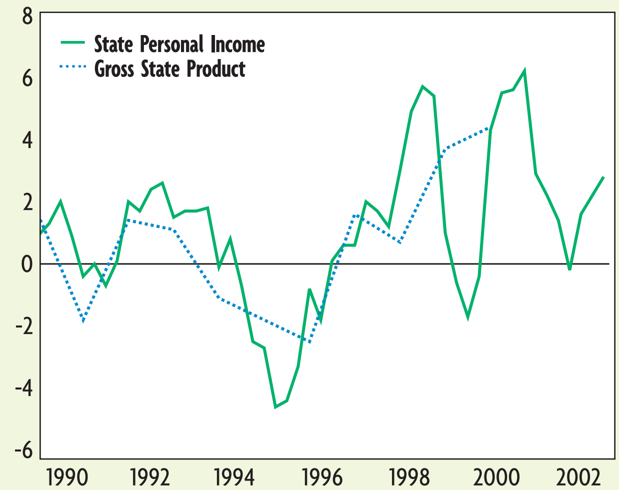
Net earnings, the largest component of personal income, rose 1.1 percent in the third quarter, matching the national rate of growth in the category. Wage and salary earnings were higher in all industry sectors, resulting in the first across-the-board gain since early 1999.

In addition to income growth, other economic indicators also improved. The number of new business bankruptcy filings dropped off, marking the third consecutive period of decline. Also favorable, venture capital investment picked up — though not by much — reversing the negative trend seen in the first two quarters of 2002.

In the real estate sector, performance in the District of Columbia's commercial and residential markets remains relatively sound. Though office vacancy rates have risen, the jurisdiction boasts some of the lowest rates nationally. Likewise, the residential market continued to advance late last year — in the fourth quarter, existing home sales reached their highest level since 1997.

Despite generally positive readings, the D.C. economy still faces possible problems. Fourth-quarter employment data were weak — the jobless rate crept back up to 6.3 percent and payrolls declined 0.4 percent. On the consumer side, the rate of mortgage loans past due ticked up slightly in the third quarter, after holding steady the first half of the year. Similarly, nonbusiness bankruptcy filings edged higher in the third quarter, following a slight decline in the second quarter.

DC Personal Income and GSP Growth
Annual Percent Change, 1990 to 2002



SOURCES:
Venture Capital Investment, PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association MoneyTree™ Survey
Personal Income, U.S. Department of Commerce, Bureau of Economic Analysis/Haver Analytics
Business and Nonbusiness Bankruptcy Filings, Administrative Office of the U.S. Courts/Haver Analytics
Mortgage Loans Past Due, Mortgage Bankers Association of America/Haver Analytics
Metro Area Office Vacancy Rates, CB Richard Ellis/Haver Analytics

		Percent Change at Annual Rate From	
	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Nonfarm Employment	650.3	-0.4	0.1
Manufacturing	11.0	0.0	-1.8
Services	309.0	3.8	1.5
Construction	10.2	8.2	-4.1
Civilian Labor Force	268.3	-3.9	-2.9
Home Sales	15.1	93.7	18.9

	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Unemployment Rate	6.3	6.0	6.6
Housing Permits	394	1,045	313

NOTES:
Nonfarm Employment, thousands of jobs, seasonally adjusted (SA); Bureau of Labor Statistics (BLS)/Haver Analytics
Manufacturing, thousands of jobs, SA; BLS/Haver Analytics
Services, thousands of jobs, SA; BLS/Haver Analytics
Construction, thousands of jobs, SA; BLS/Haver Analytics
Civilian Labor Force, thousands of persons, SA; BLS/Haver Analytics
Home Sales, thousands of units, SA; National Association of Realtors®/Haver Analytics
Unemployment Rate, percent, SA; BLS/Haver Analytics
Housing Permits, number of permits, not seasonally adjusted; U.S. Census Bureau/Haver Analytics

MARYLAND

BY ANDREA HOLLAND

Personal income and employment data are two frequently used measures of state economic activity — due largely to the comprehensive nature of personal income statistics combined with the lack of timely gross state product statistics. Recent figures from both sources suggest that the current economic downturn has been less severe in Maryland than in many other parts of the country.

Maryland is the only Fifth District state where personal income has continued to expand each quarter since the onset of recession. Additionally, on the employment front, payroll levels in Maryland are 0.2 percent higher now than when the recession began. In contrast, national and Fifth District-wide payrolls have contracted by 1.2 and 1 percent, respectively.

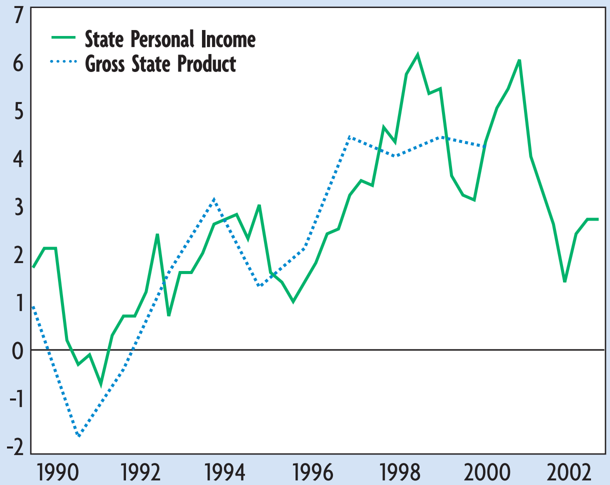
The state's personal income growth is noteworthy. Total personal income in Maryland rose by 1.0 percent in the third quarter of 2002, outpacing the national 0.9 percent rate of growth. By category, net earnings and transfer payments expanded, but dividends, interest, and rental income contracted somewhat. By industry, earnings growth was the weakest in manufacturing and trade, and earnings contracted in the transportation and public utilities sector. Subsequently, these were the only industries in Maryland that did not add jobs in the fourth quarter.

Nevertheless, Maryland posted a 4.8 percent employment gain in the fourth quarter of last year — easily exceeding the pace of growth nationally — and the unemployment rate dropped 0.2 percentage points to reach 4 percent.

Besides stronger-than-average income and employment data, other positive indicators were apparent in Maryland late last year. Consumers continued to take advantage of favorable interest rates and sales of existing housing units reached a series high in the fourth quarter. Also solid, the number of nonbusiness bankruptcy filings fell for the second consecutive period in the third quarter.

But conditions were less bright for Maryland businesses. Reflecting continued softness, office vacancy rates and bankruptcy filings inched up a bit in the third and fourth quarters, respectively. But there was some good news for Maryland firms. Venture capital flows into Maryland rose in the third quarter and remained higher over the year — hopefully encouraging greater business investment spending in the future.

MD Personal Income and GSP Growth
Annual Percent Change, 1990 to 2002



SOURCES:
Venture Capital Investment, PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association MoneyTree™ Survey
Personal Income, U.S. Department of Commerce, Bureau of Economic Analysis/Haver Analytics
Business and Nonbusiness Bankruptcy Filings, Administrative Office of the U.S. Courts/Haver Analytics
Mortgage Loans Past Due, Mortgage Bankers Association of America/Haver Analytics
Metro Area Office Vacancy Rates, CB Richard Ellis/Haver Analytics

		Percent Change at Annual Rate From	
	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Nonfarm Employment	2,473.1	4.8	0.1
Manufacturing	170.0	-3.2	-3.5
Services	868.3	4.8	0.7
Construction	169.3	27.6	5.3
Civilian Labor Force	2,902.1	-0.5	1.8
Home Sales	123.5	24.6	6.8

	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Unemployment Rate	4.0	4.2	4.4
Housing Permits	6,488	7,289	7,015

NOTES:
Nonfarm Employment, thousands of jobs, seasonally adjusted (SA); Bureau of Labor Statistics (BLS)/Haver Analytics
Manufacturing, thousands of jobs, SA; BLS/Haver Analytics
Services, thousands of jobs, SA; BLS/Haver Analytics
Construction, thousands of jobs, SA; BLS/Haver Analytics
Civilian Labor Force, thousands of persons, SA; BLS/Haver Analytics
Home Sales, thousands of units, SA; National Association of Realtors®/Haver Analytics
Unemployment Rate, percent, SA; BLS/Haver Analytics
Housing Permits, number of permits, not seasonally adjusted; U.S. Census Bureau/Haver Analytics

NORTH CAROLINA

BY ANDREA HOLLAND

Gross domestic product (GDP) data — the measure of the size of the U.S. economy — are released quarterly with a minimal lag. Unfortunately, GDP's regional counterpart, gross state product (GSP), is not as readily available — data are released only annually with a two-year lag. But as shown in the figure, personal income closely tracks with GSP and, as such, is often used by analysts as a timely measure.

During the recent recession, personal income in North Carolina contracted at a faster rate than the national average — due in part to the state's heavier dependence on the manufacturing sector. In the third quarter of 2002, for example, the manufacturing sector contributed 18.4 percent to total North Carolina wage and salary earnings compared to only 14.1 percent nationwide.

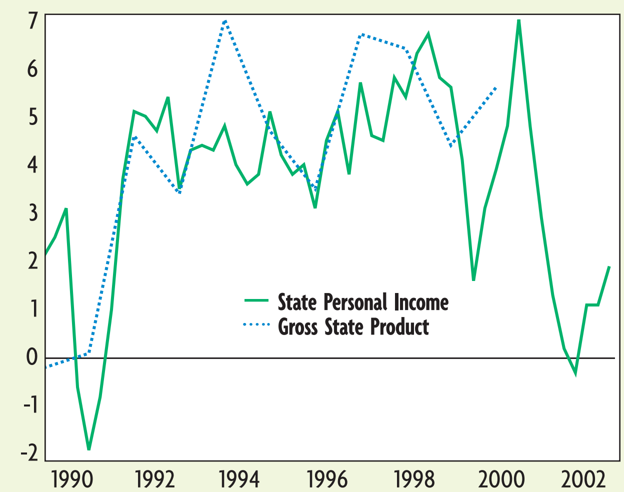
Earnings for North Carolina factory workers began to erode in early 2000 — and have contracted in six of the last eight quarters. But recent data have been more positive for state workers.

Manufacturing wage and salary earnings grew by 1.3 percent in the third quarter of 2002 — the largest quarterly expansion recorded in nearly three years. In addition, after bottoming out in 2001, average weekly hours continued to edge higher in manufacturing. In spite of strong earnings and hours data, however, manufacturing payrolls continued to weaken in late 2002, suggesting that factories could be relying primarily on increasing worker hours to meet demand.

Outside of manufacturing, wage and salary earnings rose in the third quarter in all North Carolina sectors except for construction, resulting in total income growth of 1.2 percent statewide. Also positive, new building permits grew 18.5 percent in the fourth quarter and vacancy rates for office space in the Charlotte area stabilized in the third quarter. Venture capital investment into state firms also rose significantly in the third quarter of the year. And for consumers, fourth-quarter existing home sales capped off a record year.

But the employment situation remained mixed in the state. On the upside, North Carolina's unemployment rate dropped 0.2 percentage points to reach 6.2 percent in the fourth quarter. In contrast, total payrolls declined by 1.1 percent during the same time period — due largely to the 3 percent drop in manufacturing employment. But services sector payrolls continued to expand in the fourth quarter, cementing a year of job growth.

NC Personal Income and GSP Growth
Annual Percent Change, 1990 to 2002



SOURCES:
Venture Capital Investment, PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association MoneyTree™ Survey
Personal Income, U.S. Department of Commerce, Bureau of Economic Analysis/Haver Analytics
Business and Nonbusiness Bankruptcy Filings, Administrative Office of the U.S. Courts/Haver Analytics
Mortgage Loans Past Due, Mortgage Bankers Association of America/Haver Analytics
Metro Area Office Vacancy Rates, CB Richard Ellis/Haver Analytics

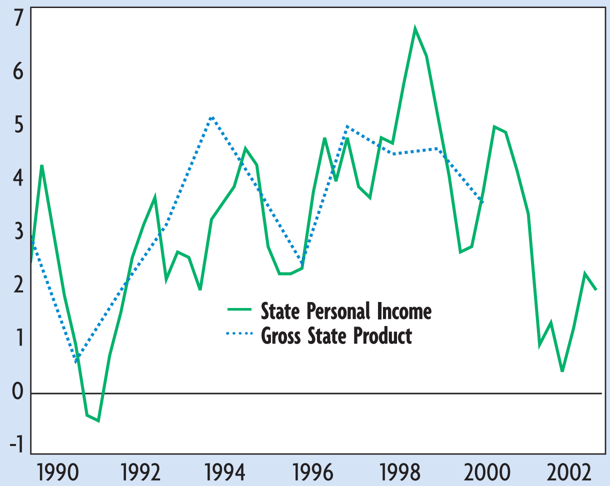
		Percent Change at Annual Rate From	
	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Nonfarm Employment	3,881.3	-1.1	-0.1
Manufacturing	696.0	-3.0	-2.5
Services	1,067.6	1.0	2.0
Construction	220.6	-2.4	-2.6
Civilian Labor Force	3,956.8	-1.5	-1.4
Home Sales	236.0	-1.7	5.4
	4th Qtr 2002	**3rd Qtr 2002**	**4th Qtr 2001**
Unemployment Rate	6.2	6.4	6.4
Housing Permits	20,963	20,092	18,206

NOTES:
Nonfarm Employment, thousands of jobs, seasonally adjusted (SA); Bureau of Labor Statistics (BLS)/Haver Analytics
Manufacturing, thousands of jobs, SA; BLS/Haver Analytics
Services, thousands of jobs, SA; BLS/Haver Analytics
Construction, thousands of jobs, SA; BLS/Haver Analytics
Civilian Labor Force, thousands of persons, SA; BLS/Haver Analytics
Home Sales, thousands of units, SA; National Association of Realtors®/Haver Analytics
Unemployment Rate, percent, SA; BLS/Haver Analytics
Housing Permits, number of permits, not seasonally adjusted; U.S. Census Bureau/Haver Analytics

SOUTH CAROLINA

BY ANDREA HOLLAND

SC Personal Income and GSP Growth
Annual Percent Change, 1990 to 2002



SOURCES:
Venture Capital Investment, PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association MoneyTree™ Survey
Personal Income, U.S. Department of Commerce, Bureau of Economic Analysis/Haver Analytics
Business and Nonbusiness Bankruptcy Filings, Administrative Office of the U.S. Courts/Haver Analytics
Mortgage Loans Past Due, Mortgage Bankers Association of America/Haver Analytics
Metro Area Office Vacancy Rates, CB Richard Ellis/Haver Analytics

		Percent Change at Annual Rate From	
	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Nonfarm Employment	1,832.0	0.7	-0.1
Manufacturing	308.1	-8.3	-4.9
Services	473.5	4.8	2.2
Construction	110.7	-3.9	-0.8
Civilian Labor Force	2,021.5	2.8	4.1
Home Sales	122.2	30.2	12.4
	4th Qtr 2002	**3rd Qtr 2002**	**4th Qtr 2001**
Unemployment Rate	6.0	5.3	6.0
Housing Permits	6,711	7,930	6,920

NOTES:
Nonfarm Employment, thousands of jobs, seasonally adjusted (SA); Bureau of Labor Statistics (BLS)/Haver Analytics
Manufacturing, thousands of jobs, SA; BLS/Haver Analytics
Services, thousands of jobs, SA; BLS/Haver Analytics
Construction, thousands of jobs, SA; BLS/Haver Analytics
Civilian Labor Force, thousands of persons, SA; BLS/Haver Analytics
Home Sales, thousands of units, SA; National Association of Realtors®/Haver Analytics
Unemployment Rate, percent, SA; BLS/Haver Analytics
Housing Permits, number of permits, not seasonally adjusted; U.S. Census Bureau/Haver Analytics

The economic downturn hit South Carolina early. Employment and personal income levels in South Carolina began to weaken about two quarters before the national recession began in March 2001.

But the gap between activity in the state and in the nation appears to be shrinking. Personal income in South Carolina expanded by 1 percent in the third quarter of 2002, outpacing the national growth rate of 0.9 percent.

Gross state product (GSP) and personal income tend to track closely in the long run. And because personal income data are released relatively quickly — with about a two-quarter lag — they are used by analysts as a proxy for GSP data, which are available annually with a two-year lag.

The most recent personal income data for South Carolina are encouraging. In the third quarter, income increased for the third consecutive quarter — suggesting growth in the state's economy. Wage and salary earnings rose 1.3 percent statewide, with income picking up in all industries except mining. The most notable turnaround occurred in the manufacturing sector — earnings were higher in both the second and third quarters, following nearly two years of contraction.

In addition to strong income growth, news was also bright on the job front. South Carolina added 3,100 jobs in the fourth quarter, marking the second quarter of expansion. Payrolls rose in services, transportation and public utilities, government, and finance, insurance, and real estate, but fell in manufacturing, construction, and trade.

On the downside, although fourth-quarter existing home sales soared to record levels, the number of new building permits authorized remained lower over the year. Also, the percentage of mortgage loans with installments past due ticked up slightly in the third quarter and personal bankruptcy filings edged higher.

And in spite of positive employment numbers, South Carolina's jobless rate kicked up 0.7 percentage points to reach 6 percent in the fourth quarter, due mainly to a seasonal rise in the labor force coupled with weaker-than-average holiday hiring.

VIRGINIA

BY ANDREA HOLLAND

Personal income in Virginia continued to expand in the third quarter of 2002, although at a slower pace than in the second quarter. Despite the deceleration, income growth has shown considerable strength over the last 12 months for which data are available. Expanding by 1 percent in the third quarter, Virginia's growth matched the Fifth District's rate and exceeded the national rate.

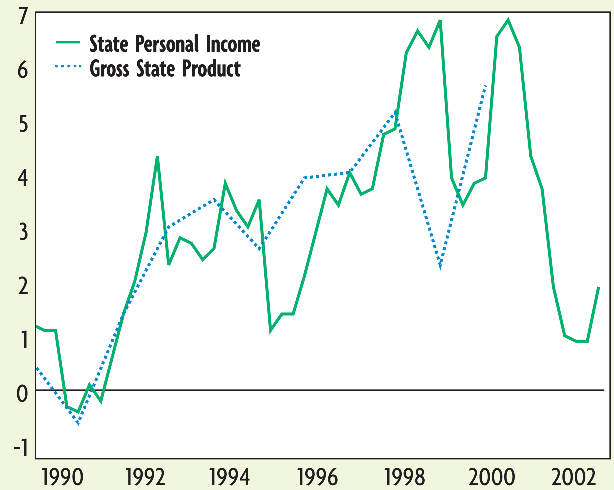
In the third quarter, wage and salary gains were recorded in all of Virginia's sectors. Growth was most robust in government, wholesale trade, manufacturing, and finance, insurance, and real estate. In addition to strong earnings by factory workers, average weekly hours reached an all-time peak at both durable and nondurable goods manufacturers — suggesting that operators may be increasing hours worked, instead of payrolls, to meet demand.

As in most other Fifth District states, Virginia data generally suggest that the consumer sector remains sound. Virginia's jobless rate fell by 0.1 percentage points to 3.9 percent in the fourth quarter, the lowest rate among Fifth District jurisdictions. In addition, consumers in the state have continued to spend throughout the downturn. In the fourth quarter, for example, new home sales reached a series high in Virginia. And in the third quarter, new vehicle registrations and taxable retail sales remained above levels recorded a year ago.

On the flipside, the percentage of mortgage loans with installments past due ticked up slightly in the third quarter of last year, but remained well below Fifth District and national rates. In addition, softness persisted in personal bankruptcy data, though there have been some bright signs recently. Filings have generally trended upward since mid-2000, but some improvement was apparent in the third quarter — the last period for which data are available.

Other Virginia data continue to have an upbeat tone. The number of new business bankruptcy filings dropped off in the third quarter, marking the second consecutive period of decline. Also, nonfarm employment data showed promise — payrolls expanded by 0.2 percent in the fourth quarter. By sector, large job additions in services, government, and finance, insurance, and real estate offset declining payrolls in manufacturing, construction, government, trade, and transportation and public utilities.

VA Personal Income and GSP Growth
Annual Percent Change, 1990 to 2002



SOURCES:
Venture Capital Investment, PricewaterhouseCoopers/Thomson Venture Economics/National Venture Capital Association MoneyTree™ Survey
Personal Income, U.S. Department of Commerce, Bureau of Economic Analysis/Haver Analytics
Business and Nonbusiness Bankruptcy Filings, Administrative Office of the U.S. Courts/Haver Analytics
Mortgage Loans Past Due, Mortgage Bankers Association of America/Haver Analytics
Metro Area Office Vacancy Rates, CB Richard Ellis/Haver Analytics

		Percent Change at Annual Rate From	
	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Nonfarm Employment	3,497.1	0.2	-0.2
Manufacturing	355.9	-1.1	-1.6
Services	1,162.4	2.2	0.9
Construction	206.6	-0.3	-2.3
Civilian Labor Force	3,782.6	0.5	2.1
Home Sales	161.2	56.6	11.9

	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Unemployment Rate	3.9	4.0	4.4
Housing Permits	14,262	15,038	11,664

NOTES:
Nonfarm Employment, thousands of jobs, seasonally adjusted (SA); Bureau of Labor Statistics (BLS)/Haver Analytics
Manufacturing, thousands of jobs, SA; BLS/Haver Analytics
Services, thousands of jobs, SA; BLS/Haver Analytics
Construction, thousands of jobs, SA; BLS/Haver Analytics
Civilian Labor Force, thousands of persons, SA; BLS/Haver Analytics
Home Sales, thousands of units, SA; National Association of Realtors®/Haver Analytics
Unemployment Rate, percent, SA; BLS/Haver Analytics
Housing Permits, number of permits, not seasonally adjusted; U.S. Census Bureau/Haver Analytics

WEST VIRGINIA

BY ANDREA HOLLAND

Over time, a state's personal income data and its gross state product (GSP) data tend to track fairly closely. But in recent years, West Virginia's personal income growth appears to lead the state's GSP growth. As the figure suggests, personal income growth picked up and declined prior to GSP in the late 1990s. The figure also shows that, unlike in other Fifth District states, income growth is only now beginning to erode in West Virginia. But it is dropping relatively sharply.

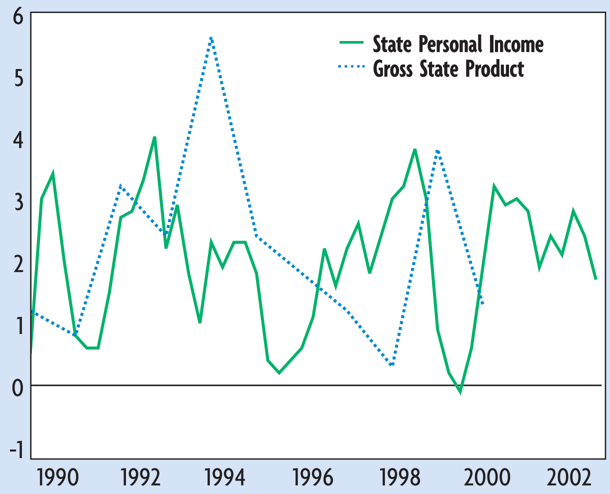
Total personal income in West Virginia expanded by only 0.6 percent in the third quarter, the lowest growth rate among Fifth District jurisdictions. In addition, wage and salary earnings growth was anemic across most industry sectors — only government, services, and finance, insurance, and real estate topped the 1 percent mark. In contrast, employee earnings contracted in the mining and construction industries.

News on the job front was also lackluster. West Virginia posted a 0.5 percent loss in nonfarm employment in the fourth quarter. Payrolls rose in the trade, government, mining, and finance, insurance, and real estate sectors, but were shaved in the manufacturing, services, construction, and transportation and public utilities sectors. The loss of services jobs marked the first decline in the series in exactly one year and is of particular concern since the sector accounts for over 32 percent of jobs statewide.

Other indicators point to a weakening of conditions for West Virginia's consumers and businesses. On a year-over-year basis, the rate of personal bankruptcy filings in the state rose considerably in the third quarter, after declining in the second quarter of last year. And the number of business bankruptcy filings edged higher in the third quarter, reaching levels not recorded since 1997. Also, the percentage of mortgages past due edged higher in the third quarter.

But some bright spots continue to exist, mainly in the residential real estate market. Consumers continued to take advantage of favorable interest rates, with fourth-quarter sales of existing housing units finishing the year on a strong note. Also, the number of building permits for single-family and multifamily dwellings remained strong, easily outpacing year-ago levels.

WV Personal Income and GSP Growth
Annual Percent Change, 1990 to 2002



SOURCES:
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Personal Income, U.S. Department of Commerce, Bureau of Economic Analysis/Haver Analytics
Business and Nonbusiness Bankruptcy Filings, Administrative Office of the U.S. Courts/Haver Analytics
Mortgage Loans Past Due, Mortgage Bankers Association of America/Haver Analytics
Metro Area Office Vacancy Rates, CB Richard Ellis/Haver Analytics

		Percent Change at Annual Rate From	
	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Nonfarm Employment	726.5	-0.5	-0.9
Manufacturing	72.2	-6.9	-4.4
Services	234.7	-1.7	1.2
Construction	31.7	-7.6	-5.6
Civilian Labor Force	808.9	-0.2	-2.9
Home Sales	29.1	13.4	3.6

	4th Qtr 2002	3rd Qtr 2002	4th Qtr 2001
Unemployment Rate	6.0	6.1	4.6
Housing Permits	992	1,132	855

NOTES:
Nonfarm Employment, thousands of jobs, seasonally adjusted (SA); Bureau of Labor Statistics (BLS)/Haver Analytics
Manufacturing, thousands of jobs, SA; BLS/Haver Analytics
Services, thousands of jobs, SA; BLS/Haver Analytics
Construction, thousands of jobs, SA; BLS/Haver Analytics
Civilian Labor Force, thousands of persons, SA; BLS/Haver Analytics
Home Sales, thousands of units, SA; National Association of Realtors®/Haver Analytics
Unemployment Rate, percent, SA; BLS/Haver Analytics
Housing Permits, number of permits, not seasonally adjusted; U.S. Census Bureau/Haver Analytics

For more information regarding state summaries, call 804-697-8273 or e-mail Andrea.Holland@rich.frb.org.

Opinion

The More the Merrier

BY AARON STEELMAN

In October 1999, the world's population surpassed 6 billion. You might have expected people to rejoice over this development. After all, it meant that the human condition was no longer "solitary, poor, nasty, brutish, and short," as Thomas Hobbes famously put it. Indeed, mankind had come a long way: infant mortality rates had dropped, life spans had increased, and prosperity had spread to areas of the world where despair had once been common.

But, instead, many observers viewed this historic event as cause for alarm. For instance, Lester Brown, head of the Earth Policy Institute, claimed that without "clearly defined strategies by governments in countries with rapid population growth to quickly lower birth rates and a commitment by the international community to support them, one-third of humanity could slide into a demographic dark hole."

Such arguments are hardly new. The classical economist Thomas Robert Malthus predicted that the rate of population growth would exceed the rate of growth of the means of subsistence. In other words, population expansion would lead to mass starvation. Malthus, of course, was wrong. In those rare cases in which famine was a serious problem during the 20th century, despotic governments were often to blame.

So how should we look at population growth: boon or bane? This question, like many others, is hard to answer in black-and-white terms. But, on balance, population growth tends to be positive for the economy.

Estimate of World Population (in millions)

Year	People
1000	310
1250	400
1500	500
1750	790
1800	980
1850	1,260
1900	1,650
1950	2,520
2000	6,079

SOURCES: United Nations (1000 to 1950 data) and U.S. Census Bureau (2000 data)

Increased population can create economies of scale. That means "that more people constitute bigger markets, which can often be served by more efficient production facilities. And increased population density can make economical the building of transportation, communication, educational systems, and other kinds of 'infrastructure' that are uneconomical for a less-dense population," wrote the late economist Julian Simon of the University of Maryland.

Economists Marvin Goodfriend of the Richmond Fed and John McDermott of the University of South Carolina have developed a model of early economic development in which population growth plays a key role, much like Simon described. "Population must grow to a threshold before our economy can support an urban-market sector. After this sector appears, rising population continues to shift effort from the household to the market sector because the latter is more efficient at larger scales of operation. The pace of urbanization is dictated by the rate of population growth in the preindustrial economy," they write.

"Population must attain a second critical level to get industrial growth going. The human-capital or knowledge accumulation that characterizes modern industrial growth does not begin until market size has expanded the range of specialized goods sufficiently to make routine innovation worthwhile. Market size, perhaps through trade, is a necessary precondition for industrialization."

All right, one might argue, population growth was good for the West centuries ago, but it surely isn't good for the poorest parts of the world today, right? Perhaps. But Nicholas Eberstadt of the American Enterprise Institute has challenged such thinking. "In the 1990s, sub-Saharan Africa was estimated to have the world's very highest rate of population growth — the United Nations Population Division put its pace at over 2.5 percent a year for the period 1995-2000 — and sub-Saharan Africa is clearly a troubled area these days. However, if we look back in history, we discover that the United States had an even higher rate of population growth at the end of the 18th century," he notes. "Some today may believe that sub-Saharan Africa has too many people — but would they say the same about early frontier America?"

Eberstadt argues that it is a mistake to assume that poverty is a "population problem" simply because it is manifest in large numbers of people. There are many reasons why sub-Saharan Africa is poor — corrupt governments, poorly defined property rights, and so on — but population growth is not near the top of the list. Indeed, it may not make the list at all.

Opponents of population growth often "mention a greater number of mouths coming into the world, and even more pairs of hands, but they never mention more brains arriving," Simon argued. This is a crucial point. More people mean more ideas — and ideas are, in many ways, the lifeblood of today's economy. We should look at population growth as a positive development. Or, at the very least, not as the catastrophe that many people claim. **RF**

NextIssue

Guns, Butter, and Money

The Fifth District has a large military presence, from the U.S. Naval Academy in Maryland, to the Pentagon near Washington, D.C., to big installations in the coastal areas of Virginia and the Carolinas. What does this mean for the Fifth District economy — both in times of peace and national emergency?

Liquid Assets

Jurisdictions throughout the Fifth District regulate the sale and distribution of alcohol in a wide variety of ways. What drives these policies and are some more efficient than others?

Who Protects the Consumer?

Occupational licensure laws are designed to keep the unqualified from entering certain professions. But instead of protecting the consumer, these rules often drive up the price of services without necessarily increasing quality. An economic view of a supposedly "essential" form of government regulation.

At the Window

Open Market operations represent the Federal Reserve's most significant monetary policy tool. But the Discount Window is also important. The Fed has recently changed the rules guiding Discount Window loans, but the mission is the same: to provide immediate liquidity to commercial banks.

On the Road

By some measures, NASCAR is now America's most popular spectator sport. But it wasn't always so. Come with us for a look at how stock-car racing went from a regional activity centered in the Fifth District to a national phenomenon.

Jargon Alert

Have you read about the "wealth effect" but weren't sure what it meant? Here's a chance to find out.

Legislative Update

Recent fiscal-policy decisions mean that the federal budget deficit will be on the rise. Will long-term interest rates be too? A look at contemporary economic thought on the issue.

Opinion

There are proposals in Congress to reinstitute the military draft. But there is little economic rationale for a conscript army.

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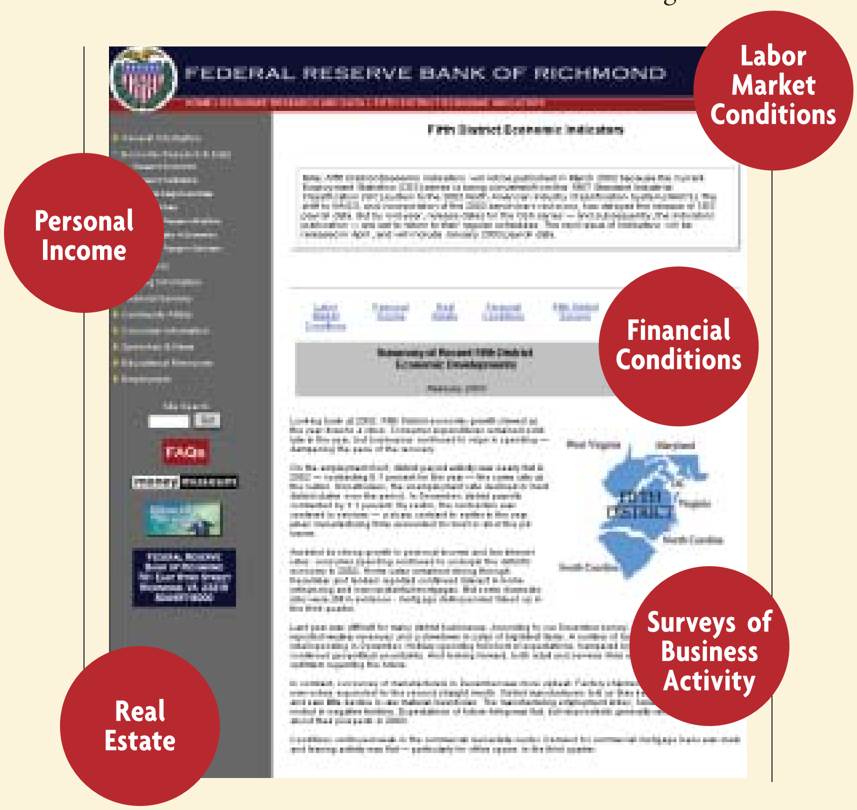

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