Trading in Acid Rain: A Report on New Doctoral Research Findings

by Sunil Malla. Mr. Malla, a student affiliate with the East-West Center, recently completed his dissertation, “An Economic Analysis of Acid Rain and Emissions Reduction in Northeast Asia.” He will graduate in May 2003.

Acidification (or acid rain as it is commonly known) caused primarily by burning fossil fuels is linked with damage to forests, lakes, groundwater, soils and human health. While for years scientific research has indicated the seriousness of this problem, and abatement strategies were initiated both at the national and regional levels in Europe and North America, only recently has it been recognized as an environmental problem in Asia.

In fact, environmental quality has deteriorated rapidly in Asia, so it now one of the world’s most polluted regions. Of the world’s 15 most polluted cities, 13 are in Asia. A study by the Asian Development Bank (ADB) found that during the last three decades, Asia has lost half of its forest cover and fish stock. Sulfur dioxide concentrations (one of the precursors of acidification) in most Asian cities regularly exceed the World Health Organization recommended limits. Rainfall in some regions, particularly in Northeast Asia, has been measured to be ten times more acidic than unpolluted rain.

Increasing evidence of acidification damage to surface waters, soils, and economically important crops is beginning to appear. Despite these potential threats, however, limited action has been taken and further reduction of acid rain in Asia seems necessary.

Economists have long advocated the use of economic instruments for controlling transboundary air pollution rather than traditional command and control regulations. One such economic instrument is the tradable permit. A tradable permit system confers on pollution sources the right to release specified amounts of pollutants, and then allows enterprises to buy and sell those pollution rights in a market. Economic theory tells us that if permit markets are fully competitive, free trade in emission permits can result in a cost-effective permit allocation among emission sources, in the sense that the pollution target is met at minimum abatement cost.

The tradable permits approach is gaining in popularity because of recent evidence confirming both its economic efficiency and environmental effectiveness. The most recent example of international interest is the explicit inclusion of the tradable permits approach in the 1997 Kyoto

Continued on page 8

Estimated sulfur deposition in Northeast Asia by 2010
A Report from the Chair

Ringing out the old year, ring in the new year!! But not so fast—the old year, 2002, was a pretty good year for UHM Economics. Here are a few of the many highlights.

Our undergraduate program has been restructured to allow more non-majors to take our courses and to ensure that our majors still receive a rigorous training in economics. In Fall 2002 Prof. Jim Mak started teaching his new undergraduate course, *Introduction to Tourism Economics*, where he field-tested his new book on tourism economics. Prof. Byron Gangnes prepared to teach his new undergraduate course, *Economic Forecasting*, in Spring 2003. Prof. Xiaojun Wang revived both the graduate and the undergraduate *Chinese Economy* courses.

And development of many more new courses continues. Prof. Sherstyuk finished work on *Games and Economics Behavior* while Prof. Sang-Hyop Lee completed preparations on *Mathematics for Social Scientists*.

The Economics Club organized a wildly successful Career Night in April 2002 and, by the time you receive this newsletter, the Club will have sponsored a second wildly successful Career Night in December 2002.

Three major research projects—all financed with outside grants—got off to a flying start in 2002. Profs. Denise Konan, Carl Bonham, and Andy Mason began studying the sustainability of tourism in Hawaii (funded by Hawai‘i Department of Business, Economic Development, and Tourism). The “Coverage for All Project” (funded by the federal Health Care Services Administration), which examines how to extend health insurance to the entire Hawai‘i population, was organized by Prof. Gerry Russo and contains research projects directed by Profs. Sang-Hyop Lee and Katerina Sherstyuk. Yours truly organized and presented a paper in Washington, DC symposium, “Fixing Japan’s Economy” (funded by the Japan-United States Friendship Commission), which was attended by DC policymakers interested in Japan and representatives of major US and Japanese corporations.

Our graduate students continue to excel. Three doctoral students who were *oh so close to finishing their dissertations* received a Campbell Dissertation Award to finish their work. And guess what? All three—Naresh Pradhan, Asclepias Soerjono, and Yoav Wachsman—finished their dissertations! Xiaopeng Cheng received an internship at the International Trade Center UNCTAD/WTO in Geneva, Switzerland for Fall 2002. Takashi Yamamoto received a fellowship from the UHM Center for Japanese Studies for the 2002–2003 academic year. Yoav Wachsman and Xiaopeng Cheng presented papers at the Western Economic Association Meetings, while Ari Van Assche presented a paper at the Harvard East Asia Society Graduate Student Conference.

Profs. Andy Mason and Sumner La Croix had a wonderful dinner with UHM PhDs in economics in Bangkok, Thailand while Prof. Chung Lee dined and dined with UHM PhDs in Seoul, Korea. It was great to see our former students doing so incredibly well!!

*Continued on page 5*
O
ver the past two decades there have been
dramatic changes in the types of technolo-
gies available to businesses. According to
the Current Population Survey (CPS) data sets, the
percentage of workers using the Internet at work
increased from 16 to 29 percent between 1997 and
2000. The percentage of workers using a computer
at work increased even more, from 25 percent in
1984 to 53 percent in 2001. (See the table below.)

The rapid development and diffusion of these new
information technologies has altered the produc-
tion process in many workplaces. Along with funda-
mentally changing the physical capital of firms, it is
also widely believed that their introduction has
altered the wage structure in the labor market.
Specifically, it is argued that many of these new
technologies increase the demand for skilled
workers relative to unskilled workers. This hypoth-
esis of skill-biased technological change is offered
as the primary explanation for the increased returns
to education and the increased wage differential
between skilled and unskilled workers that has been
observed recently in the United States.

How has the use of the Internet—and computers in
general—changed the labor market and the wage
structure? Empirical analysis using CPS data
suggests that there is still a substantial return to
computer use. The earnings differential in hourly
pay between workers who use computers on the job
and those who do not was 14 percent in 1997,
falling slightly to 11 percent in 2001. However, the
results from Internet use are quite different;
between 1997 and 2000, as Internet use became
more commonplace, the premium attached to its use
completely disappeared. This is in contrast to the
very slow decrease in the returns to computer use
that have occurred over a much longer time period.

The natural question is why the return to Internet
use is smaller than that for computer use? One
possibility involves the notion of skill upgrading.
Previous research has found that the there was a
very small wage premium associated with adoption
of factory automation technologies, but there is a
much larger premium associated with investment in
new computer equipment. Researchers have argued
that this may be explained by the greater skill
upgrading that is associated with computer use. If
Internet use requires less skill than other kinds of
computer application, then this could explain the
absence of any wage premium for internet users.

Another piece of evidence supporting this argument
comes from comparing union and nonunion wages.
It is well-known that wage differentials by skill
level tend to be smaller in union sectors. Consistent
with this, we found that the wage differential to
computer use is smaller in the union sector. But
there is no difference in Internet wage premiums
for union and nonunion workers, again suggesting
that Internet use is not related with skill upgrading
and hourly pay.

Is the evolution of the wage structure tied to future
developments in technology? The answer is both
yes and no. It depends on the characteristics of
technologies and their speed of adoption. There is
little link between Internet use and wages, whereas
the link between computer use and wages is much
clearer.

### Computer Use at Work: Percent of Workers Who...%

<table>
<thead>
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Alumni Profile: Pauline Sheldon Heads Up TIM School

by Francisco Brignole

The author is an undergraduate Economics major at UH Mānoa. He met up recently with Prof. Pauline Sheldon to discuss her experience as a UH Econ graduate student, her current job as Interim Dean, and her views on the prospects for Hawai’i’s leading industry.

Pauline Sheldon, Interim Dean and Professor in the School of Travel Industry Management at the University of Hawai’i at Manoa is one of many former UH Economics students who are succeeding professionally. Prof. Sheldon, originally from England, completed her Bachelor’s Degree in mathematics at Southampton University. Later she went on to earn an MBA and to successfully complete her Ph.D. in Economics and Management Information Systems at UH.

Prof. Sheldon had always been fascinated by tourism and traveling but never thought she would actually study it academically. It was only after she completed her Ph.D. in Economics that she realized how much economic analysis helps in analyzing the tourism industry. In fact, Prof. Sheldon believes that tourism, as the largest industry in the world, is having a huge economic, social, cultural, and environmental impact, and she considers that economics plays a “critical” role in understanding how it all works.

While studying in our economics department she found the professors to be a very valuable part of the program. She really enjoyed her courses in microeconomics analysis and industry structure taught by Sumner La Croix and the late Larry Miller. To students in our department, Prof. Sheldon’s advice is to study hard, for these are the years in their lives when students should devote themselves to understanding the principles of economics that will be useful to them for a lifetime.

Currently, her duties at the TIM school include overseeing the strategic planning of the school, hiring new faculty, making curricular changes in the program, and working with the industry in Hawai’i. In addition, she helps students with career placement and internship opportunities, and she does fundraising for the school. Prof. Sheldon also represents the school at meetings of a number of other organizations such as the World Tourism Organization, the Pacific Asia Travel Association and the Travel and Tourism Research Association, to name only a few.

Her job as Interim Dean may not last long, however, since the search for a new Dean is now underway. Once the position is filled she is looking forward to going back to teaching, doing research, writing and “all of those good things.” Prof. Sheldon has taught courses in tourism information systems, tourism policy, tourism economics and research methods in tourism. But she has also done a lot of research, and she has a large number of publications on the topics of tourism information systems, tourism demand modeling and tourism as an academic subject.

Prof. Sheldon sees the tourism industry in Hawai’i as gradually recovering from the challenging times it has faced since 9-11. She points out that in recent months the numbers of U.S. visitors are essentially back to the levels they were a year ago. The increasing number of visitors coming from the U.S. East Coast has made up in part for the reduction in Japanese visitors coming to Hawai’i since September 11. Prof. Sheldon cautions that Hawai’i needs to solidify its visitor base. To do this, a lot more promotion is being targeted on the East Coast and on Asian markets other than Japan, such as Korea and Taiwan. She also claims that Europe carries a lot of promise as a big potential market.

Despite this warning, Prof. Sheldon is optimistic about the future of Hawai’i as a tourist destination. She reminds us that Hawai’i has one of the highest levels of visitor satisfaction in the world. Further-
more, she says that when people around the world are asked where would they most like to go on a vacation they say Hawai‘i. To Prof. Sheldon these facts mean that Hawai‘i is still in the forefront of people’s minds as a tourism destination.

Prof. Sheldon asserts that the tourism industry also offers promise for developing economies. But again, she warns that this is not a panacea. Unless the industry is developed correctly, it can bring a lot of negative side effects. If there is a lot of foreign investment in the industry, situations may arise where a lot of the economic revenue flows out of the developing economies. For tourism to work as a potential savior for developing economies it is imperative that the local populations benefit from the industry as well.
Awards and Honors

In Spring 2002, **Tu Ha** was given the award for Best Senior Economic Major and **Katie Tangtipongkul** was named Outstanding Student in Economics.


Ph.D. candidate **Ari Van Assche** was invited to attend Nobel Laureate James Buchanan’s workshop “Economics Beyond Neoclassical Limits” in Blacksburg, VA, in June.

### Advanced Degrees Awarded

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<tr>
<td>Ph.D.</td>
<td>Jaejin Byun</td>
<td>May 2001</td>
<td>“Horizontal and Vertical Analysis”</td>
</tr>
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<td>Jeffrey Brown</td>
<td>May 2002</td>
<td>“Three Essays on Old Age and the Family”</td>
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<td>Hing Ling Chan</td>
<td>May 2002</td>
<td>“Multinational Firms, Skill Investment and Government Policies”</td>
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<td>Meechai Orsuwan</td>
<td>May 2002</td>
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Yong Her Yeh published “A Note on Custom Unions vs. Non-Preferential Tariffs,” *Atlantic Economic Journal*.

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**Burnham O. Campbell Memorial Fund**

We in the Department of Economics wish to express our thanks to those of you who have earmarked your donations to the UH Foundation for the Campbell fund. This scholarship fund established in Campbell’s memory benefits graduate students of economics specializing in Asian development. Your gifts mean a great deal to us.

To ensure accurate processing of your gift, please complete this form and mail it along with your tax-deductible donation to: Burnham O. Campbell Memorial Fund, UH Foundation, P.O. Box 11270, Honolulu, HI 96828-0270.

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Mighty Paddlers!

Hard to believe, but Econ Professors Chung Lee, Jim Mak and Jim Roumasset have a life outside the classroom. Here they are relaxing with the Hui Nalu Canoe Club.

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Or email us at: econ@hawaii.edu

Name _____________________________________________

Address _________________________________________________________________________________

Email _____________________________________________________________________________________

UH Degree (s) and date(s) __________________________ Major Professor___________________________

Degree(s) from other institutions and date(s) ____________________________________________________

Present position, employer, location_________________________________________________________________________

Awards, honors, fellowships ________________________________________________________________

______________________________________________________________

Other news and information ______________________________________________________________________

Send a note to your favorite professor! _________________________________________________________

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My research investigates whether a system of tradable permits can contribute to cost-effective acid rain emissions reduction in Northeast Asia. The characteristics of acid rain make this a challenging problem. Unlike uniformly dispersed pollutants such as carbon dioxide, the damage caused by sulfur dioxide and related pollutants depends not only on the amount of emission but where the pollutants end up. Therefore, a deposition permit must specify both the amount of permitted emission and the geographic area where those emissions may be deposited.

The results from analyzing a deposition permit scheme suggest there is considerable potential for their implementation in emerging economies like those of Northeast Asia. However, problems exist with the tradable permits approach if there are high transaction costs, if firms have market power, or if there is insufficient monitoring and enforcement. It is important to increase the emphasis in environmental policy-making on enforcement, openness, accountability, and access to information, as well as encouraging further international cooperation.