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# Economics

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## My Journey to UC San Diego

### FACULTY SPOTLIGHT

By Halbert White Jr., Ph.D.



I was born and raised in Kansas City, Mo., where I attended Southwest High, graduating in 1968. There, I was salutatorian, having gotten edged out from the valedictorian spot by a few thousandths of a GPA point. If I had been smart enough not to take orchestra for credit, I could have been valedictorian, but since the valedictorian was smart enough to not do that (damned clarinet players!), I always figured she deserved it.

I applied to Harvard and Princeton universities for college and got rejected from Harvard. Later, when I was deciding whether to stay at University of Rochester or move, I ended up choosing the UC

San Diego offer over that from Harvard, but not because of my undergrad admission experience. Like Groucho Marx, I apparently wouldn't want to belong to an organization that would admit someone like me (except in California).

Luckily, Princeton accepted me, and I was thrilled to go there, expecting to be a physics major. One problem: I couldn't understand physics to save my life. The only way I made it through physics to satisfy my science requirement was extensive tutoring by [Vince Crawford](#), who was my freshman year hallmate (in Dod Hall). By second semester sophomore year, I had decided economics was much more interesting and doable, and I was fortunate to have great professors, among them Steven Goldfeld; Richard Quandt; Gregory Chow; Ray Fair; William Branson; George DeMeni.; Orley Ashenfelter; Dan Hamermesh and my senior thesis advisor, Alan Blinder. Alan was a new assistant professor then, fresh out of Massachusetts Institute of Technology.

At Princeton, I played my trumpet in the marching band, in the orchestra (but not for credit) and in the Triangle Club – and in a wide variety of student groups: a brass quintet, several big band jazz groups and various soul/rhythm and blues bands, including The Nassau Brothers Soul Revue. This time I did manage to grab the valedictorian spot, although at Princeton this is not determined by GPA, but by departmental nomination and election by the faculty.

Given the large number of my professors who came from MIT, that seemed to be the place to go next. So, there I went in the fall of 1972, along with Vince Crawford. My class at MIT has turned out to be quite distinguished, containing not only Vince, but also UC San Diego's [Roger Gordon](#), who was my office mate in an office around the corner from Fisher Black and Robert Merton. Our office had no windows, but it housed both of us (as well as Zvi Bodie), and gusts of sticky black soot would periodically blow out of the air vent. My illustrious classmates also include Peter Berck, Glenn Lowry, Steven Sheffrin, Stephen Figlewski, Allan Drazen, Mario Draghi, Jeff Perloff and Dennis Carlton. It was at MIT that I unknowingly established a later claim to fame by grading the homework of both Ben Bernanke and Paul Krugman as a teaching assistant for Jerry Hausman's econometrics classes. No surprise – they both did well. Frequently, I could use Bernanke's homework as an answer key!

Of course, the faculty at MIT while I was in grad school were stunning: Paul Samuelson; Robert Solow; Evsey Domar; Jagdish Bhagwati; Franco Modigliani; Charles Kindleberger; Frank Fisher; Peter Temin; Stan Fisher; Rudy Dornbusch; Hal Varian; Robert Hall; and very notably Rob Engle, a newly minted Ph.D. from Cornell University; and a young Jerry Hausman, fresh out of Oxford University.

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*Hal and his wife, Teresa White, at the Xiamen Conference on Specification Testing in 30 Years*

I had somewhat of a hard time finding a thesis advisor to supervise my dissertation in labor economics, but eventually I knocked on the right door – Jerry’s – and found the best advisor a young grad student could hope for. Jerry was always available and encouraging and provided ways forward whenever I hit what seemed to me to be a hopeless roadblock. My dissertation committee also included Lester Thurow (with whom I published my first “Econometrica” article, in international trade in 1976) and Bob Solow.

My job market experience in 1975 to 1976 was a harrowing one. I had 27 interviews, including the University of Chicago, where among my interviewers was Jim Heckman. The interview consisted of him demolishing my labor economics job market paper. I did end up with a good number of fly-backs, including UC San Diego, but I did not get a UC San Diego offer (although Vince Crawford did, and took it). Nor did I have any top 5 or 10 fly-backs, and especially not Chicago! Only at the last minute, the night before I was just about to accept a very good but not great offer, did I get a call from the University of Rochester offering me a fly-out with a practically guaranteed offer. After consulting with Jerry, I decided to turn down my existing offer and bet my future on the Rochester possibility. In hindsight, I strongly suspect that Jerry was operating behind the scenes to generate that opportunity, making sure that his No. 2 thesis advisee (Roger Gordon was his first) was well treated in the market.

Rochester did come through with an offer, and an extremely attractive one at that: \$16,000 for the academic year! Plus, I was thrilled to be going to a truly distinguished department, including among others Lionel McKenzie, Sherwin Rosen, Stanley Engerman, Robert Barro, Walter Oi, Eric Hanushek, Elhannon Helpman and James Friedman. Econometrician G. S. Maddala had just left for Florida, but Charles Plosser and Bill Schwert were in the U of R Graduate School of Management just a few steps away, so I did have econometrics colleagues handy. The thing was, at that time, I was a primarily a labor economist and only secondarily an econometrician. So, there were some semesters that I taught macro and urban economics instead of econometrics. (Not that I knew macro or urban – these were just what was left over after the more senior faculty had chosen their courses!) I did accidentally learn a valuable lesson, though, in teaching those classes: Make the first lecture about using the method of Lagrange multipliers to do constrained optimization. Not only is almost everything in economics a special case of this, but it causes half of those enrolled to drop the class immediately.

My transition from labor economist to econometrician took place in the first few years at U of R. One factor was that all of my labor economics articles based on my thesis chapters got rejected from all of the field journals. Another was that I learned measure theory from Robert Bartle’s superb book “Measure and Integration” in a small study group consisting of game theorist Jim Friedman, general equilibrium theorist Larry Benveniste and myself. Each week we met and worked through a chapter of Bartle’s book and presented solutions to the exercises. From this, I finally began to understand asymptotic distribution theory.

At the same time, I was deeply concerned by the prevalence of misspecification in econometric models and the fact that not much was known at a general level about the consequences of misspecification. Especially puzzling was the then-common wisdom that OLS applied to a misspecified model gave you a Taylor-series approximation to whatever the true relation was. This made no sense to me, so I wrote a paper called “Using Least Squares to Approximate Unknown Regression Functions.” Amazing to me, this was accepted by the “International Economic Review” for publication. Since, thanks to measure theory, I now seemed to know what I was doing, and since I had finally succeeded in getting an article published, I then began to think that maybe econometrics was a better place for me than labor economics or international trade. (As an interesting aside, the IER paper now has nearly 300 citations, according to Google Scholar, but there are still lots of people who think least squares gives you a Taylor approximation!)

This paper then led to my famous “Econometrica” paper on heteroskedasticity, where my final conversion to an econometrician was effected by a referee who said that he

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would recommend publication, provided that the included labor economics example was removed. Finally, I got it! Econometrics was my way forward.

An especially outstanding feature of the U of R was the wonderful group of graduate students it attracted. Eventually, I did get to teach the graduate econometrics classes. Two of my now distinguished students there were Gary Gorton and Glenn MacDonald. And one of the most important relationships of my life began when Charley Bates showed up in my office one day with his little Lhasa apso dog, Li Po, to see about studying econometrics.

Charley had just finished an undergrad math degree at UC San Diego with a minor in economics. Charley ended up taking my econometrics classes, and after an interesting odyssey, eventually became my thesis advisee. As it turned out, that was just the beginning of a lifelong friendship and collaboration with Charley that has had an extremely positive impact on both my professional and personal life. Among other things, we cofounded our economics consulting firm Bates White, LLC, together with a small group of econ Ph.D.s that Charley had handpicked. The firm will soon celebrate its twelfth anniversary, and it now employs more than 150 highly talented people, many of whom have direct or indirect connections to UC San Diego. I am especially gratified that the firm is now well known for setting new quality standards in the economic and econometric analysis of legal disputes.

Another transition began in those early days at the U of R, and that was my transformation from an East Coast type with a Midwestern background to a California type. That transition began with a phone call in early May of 1977 from Rob Engle, who was by then at UC San Diego with Clive Granger. Rob's call came just one day after Rochester had received three FEET of snow (in May!) in a still-famous blizzard. He inquired if I might be interested in being a visiting assistant professor at UC San Diego. I had to think about that for a while – perhaps ten seconds. As it turned out, I was not able to visit the next academic year, but it did work out that I was able to visit in the winter and spring quarters of 1979. So, it was that in December of 1978 I flew out of Rochester during a blizzard and arrived in 75 degree San Diego sunshine to begin a visiting appointment at UC San Diego.

Dr. Halbert L. White Jr. is a Chancellor's Associates Distinguished Professor of Economics, a Fellow of the American Academy of Arts and Sciences and the Econometric Society and a Guggenheim Fellow. He has the most cited work in economics literature published since 1970 and was honored for distinguished teaching in a graduate course. He cofounded Bates White Economic Consulting with Dr. Charles Bates in 1999. The Causality, Prediction and Specification Analysis conference will honor the lifelong achievements of Dr. Halbert L. White Jr. on May 6–7, 2011.



*Halbert White Jr. with Chung-Ming Kuan, Jerry Hausman, Yongmiao Hong and students from Xiamen University in China*

# Economics

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### FACULTY SPOTLIGHT

## Pioneer in the Field of Econometrics

By *Valentina Corradi, Ph.D. '94, and Norman R. Swanson, Ph.D. '94*

During this year, the 60th for Halbert White Jr. (Hal to his friends and colleagues), it is with great pleasure that we – a couple of Hal's former UC San Diego students who have had the good fortune of getting to know him as a person, researcher, coauthor and colleague – provide you with some insight about what it takes to be an academic like Hal White.



### Professionalism

What does it take to win a Nobel Prize in economics? A blockbuster contribution to the field and an illustrious career punctuated by the publication of numerous brilliant and groundbreaking papers. Seems reasonable. There's little to argue against inscribing Hal's name on the relevant shortlist. But one of the clearest memories of Hal is one that does not have to do with his superb track record in research – it has to do with his incredible professionalism.

In the early 1990s, Norm was a teaching assistant for Hal's Intro to Economic Statistics class at UC San Diego. As he recalled, "I was acting as one of many TAs to that class, given that the class had a huge number (certainly at least a couple of hundred) of students in it. Each day, over the course of the quarter, Hal pulled out his laptop and, via use of ingenious examples, proceeded to imbue the students with a great knowledge and a keen interest in statistics. Students were so eager, front row seats were taken long before

each class started. As I took it all in, I was simply amazed at the level and quality of instruction offered by Hal. It seemed that the brilliant lectures he had given my first-year Ph.D. class on asymptotic theory for econometricians (using his famous text of the same title) a couple of years earlier were par for the course. In any case, the end to this story is that on the last day of classes, after a final awesome lecture, the students of this massive class all got to their feet and gave Hal an incredibly long and clearly heartfelt standing ovation. I'd never before seen such an outpouring of appreciation for an instructor, particularly a teacher of statistics. I've never seen such an outpouring of appreciation for an instructor since. He deserved it. He is the ultimate professional. Truly a class act, a gentleman and a scholar in every sense."

### Contribution to Econometric Theory

There is little doubt that Hal has been one of the most important – if not the most important – player in econometric theory and in econometrics in general, over the last 35 years. There are many ways of measuring the role he has played in the profession and the impact he has had on research. For example, "**A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity**" ("Econometrica," 1980), also often referred to as the White Standard Errors Paper, has 5,738 citations on the Web of Science, and is thus one of the most highly cited papers ever, both in econometrics and in the entire field of economics. If we look at key papers of past Nobel Prize winners in econometrics, we see that Robert Engle and Clive Granger's "**Co-integration and Error Correction: Representation, Estimation and Testing**" ("Econometrica," 1987) and Engle's "**Autoregressive Conditional Heteroscedasticity with Estimates of Variance of United Kingdom Inflation**" ("Econometrica," 1982) have 4,474 and 3,254 citations, respectively. James Heckman's seminal sample-selection bias paper has 4,269 citations. Other keystone papers in econometrics, such as Jerry Hausman's testing paper and Lars Hansen's generalized method of moments estimators have 2,649 and 2,206 citations, respectively.

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## Impact of Publications and Research

Indeed, Hal is one of the most broad and prolific scholars in economics. He has more than 125 full-length articles spanning all of the very top journals in economics, statistics and finance. He has also written three seminal books in econometrics and has edited more than 10 other volumes.

His research has had a major impact not only in econometrics and in economics, but also in statistics, finance and computer and cognitive science; and in recent years his work has also had an impact even in medicine and the natural sciences. For example, his seminal paper on artificial neural networks (joint with Kurt Hornik and Max Stinchcombe) entitled **"Multilayer Feedforward Networks Are Universal Approximators"** ("Neural Networks," 1989) has 3,862 Web of Science citations. He even has an article recently accepted to the "Michigan Law Review." This is indeed a characteristic unique to Hal. We cannot think of a broader and more eclectic scholar.

We could easily write many pages outlining the reasons why Hal White is one of the greatest econometricians ever. For now we shall simply say that the main reason why Hal is a true leader in the profession is that he is an authentic pioneer. He sees things far in advance of anyone else. In virtually all of the areas to which he has contributed, he has cleared the first path and laid the groundwork for further study.

## Pioneering Publications

One of the things Hal did upon arriving at UC San Diego was to write his book **"Asymptotic Theory for Econometricians"** (1984). This was absolutely new and groundbreaking. Hal realized that in order to develop econometric theory – and also in order to be a competent user not limited by the availability of ready-to-use procedures – one should be able to understand and combine all of the relevant tools from probability theory and mathematical statistics. He was the first to develop and make accessible to econometricians the necessary tools for deriving the properties of estimators and constructing tests under a full menu of realistic settings. Hal was the first to teach us about the interplay between properties of the data (how much dependence there is in the series and how many moments are finite) and theoretical features of the model postulated by the researcher, as dictated by econometric theory. Whether an estimator has a well defined probability limit depends on the statistical properties of the data, but the meaning and economic interpretation of that probability limit depend on the theoretical model. One of the fundamental insights Hal emphasized is that all models are an approximation to reality, and are thus generally incorrect. Nevertheless, we can learn important things, even from an approximation of reality. Furthering this idea, a complete and rigorous treatment of estimation and inference with misspecified (i.e., generally incorrect models) is given in his book **"Estimation, Inference and Specification Analysis"** (1994). There is little doubt that modern econometric theory was pioneered by Hal. Hal's contributions have been fundamental not only to the field of theoretical econometrics, but also to the field of empirical economics. In particular, thanks to Hal's work, standard econometric tools, such as hypotheses testing and inference in general, are now utilized correctly, in a variety of realistic contexts.

## Contributions to the Field

It is literally impossible to list all of Hal's seminal contributions. We confine our attention to five particular standouts:

### 1. White Standard Errors

Empirical work often requires one to test the null hypothesis that a parameter – say, that associated with conveying the returns to an extra year of schooling – is zero or is instead strictly positive. Standard computer packages have always provided a ready-to-use solution to the problem. However, the classical solution is correct only under a particular assumption, known as conditional homoskedasticity. This assumption states that the variance of the error in a given model, conditional on the explanatory variables, is constant. This is a very restrictive assumption, often violated in practice. In fact, the variance of the error often depends on the individual covariates, in an unknown manner. However, if conditional homoskedasticity fails to hold, the inference that we draw based on the classical solution is incorrect, and may lead to the wrong conclusion (we might conclude that an extra year of schooling has no effect on



*Clive Granger and Hal White in January 2004 at UC San Diego*

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wages, when instead it does). This is because the variance/standard error estimator used by standard packages is only consistent for the “true” variance/standard error under conditional homoskedasticity.

In “**A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity**” (“Econometrica,” 1980), Hal developed an estimator of the covariance that is robust to the presence of conditional heteroskedasticity of unknown form. This estimator is now routinely available in all computer packages, and is called White Standard Errors. It is now common practice to report both “classical” and “White” standard errors.

White Standard Errors, although crucial to applied econometric analysis, still require that the error of the model is not autocorrelated (the error does not depend on its past). This is typically the case when we have cross-sectional observations. For example, we have data on a group of individuals at a given point in time, rather than data that are measured over time, such as the consumer price index. If we do have data measured over time, called time series data, then the error is not autocorrelated only if the model is “dynamically correctly specified.” For dynamic correct specification, we mean that both the functional form of the model and the dynamics specified for the model (the number of lags or past values) are correct. However, in practice, dynamic misspecification is more the rule than the exception.

In articles coauthored with Ian Domowitz (“Journal of Econometrics,” 1982, and “Econometrica,” 1984) and as elaborated in his book “**Asymptotic Theory for Econometricians**” (1984), Hal proposed a variance estimator that is robust to both heteroskedasticity and autocorrelation of unknown form, and which is now known as a HAC (heteroskedasticity and autocorrelation robust) estimator. Whitney Newey and Ken West, in a famous “Econometrica” paper published in 1987, refined Hal’s estimator to ensure positive definiteness, which is crucial for empirical application, yielding the famous so-called Newey-West estimator. Of course, all of this work was predicated in large part on the initial 1980 “Econometrica” paper and Hal’s seminal work with Domowitz.

## 2. Maximum Likelihood Estimation of Misspecified Models

Another key contribution from Hal is “**Maximum Likelihood Estimation of Misspecified Models**” (“Econometrica,” 1982). This paper is also among the most cited ever, with 1,389 citations on the Web of Science. The idea underlying Maximum Likelihood Estimation (MLE) is that the estimators we compute are those maximizing the probability of observing the sample of data that we actually observe. If we correctly specify the conditional density of the data, then ML estimators are the “best estimators”: They are consistent, asymptotically efficient and invariant to reparameterization. However, we almost never know the correct conditional density. For example, sometimes we are able to correctly specify only the conditional mean and maybe the conditional variance, and sometimes we are not even able to correctly specify the conditional mean.

In the end, as Hal emphasized, models are just approximations of reality and are generally incorrect. But what happens if we estimate misspecified models using Maximum Likelihood? Hal shows that MLE generally converges to the parameter values minimizing the Kullback-Leibler Information Criterion (KLIC). Specifically, MLE always converges to the parameters minimizing the “surprise” that we get when we believe that our data are generated by a given model, but instead we learn that they are generated by a different one. Further, if we misspecify the conditional distribution but still correctly specify the conditional mean, then the ML estimator, under very mild conditions, converges to the same value, as in the case of “full” correct specification. Nevertheless, the asymptotic variance is different, and this should be taken into account when performing hypothesis testing.

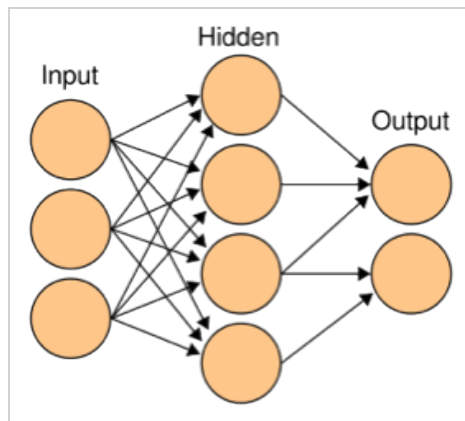
This observation led to the celebrated Dynamic Fisher Information Matrix test due to Hal. The main practical implication of his work on MLE with misspecified models is that one can simply estimate models via Gaussian Maximum Likelihood (one can proceed as if the errors are conditionally normal, even if they are not). This has had tremendous impact on applied work. Estimation with Gaussian likelihood is very simple to implement, and it is incredibly useful to know that it can deliver valid inference even if conditional normality does not hold.

This work also played a part in inspiring the subsequent literature on the estimation of conditional autoregressive models (ARCH and GARCH models). In this context, one postulates a model for the conditional mean and the conditional variance, even though the conditional density of the error is generally unknown and typically has fatter tails than those associated with a normal random variable. However, Gaussian ML generally gives consistent parameter estimates and allows for correct inference as a consequence of Hal’s theory. Hal’s 1982 paper was also the starting point for a literature based on the use of the KLIC for model specification and testing (see the recent applications of the KLIC to measuring serial dependence by Yongmiao Hong and Hal White in “Econometrica,” 2005, and to forecast evaluation by Raffaella Giacomini and Hal White in “Econometrica,” 2006).

## 3. Neural Network and Consistent Specification Tests



Neural network models were introduced by cognitive scientists in an attempt to build computers that could learn from experience instead of having to be programmed. Such models are characterized by input variables (sensory information) that “pass through” one (or more) hidden processing layers, yielding an “output” (a classification, prediction or action). In a series of seminal papers, some joint with Ron Gallant or with Kurt Hornik and Max Stinchcombe, Hal has shown that such models have a “universal approximation” property, in the sense that they are able to approximate any generic function, as well as its derivatives, up to an arbitrary level of accuracy, given mild conditions. Although not as well known to economists, one of Hal’s key papers on this subject, **“Multilayer Feedforward Networks are Universal Approximators”** (“Neural Networks,” 1989), has received 3,862 citations on the Web of Science, as mentioned above.



*The workings of a feedforward neural network*

The flexibility of a neural network model is ensured by its dependence on a number of parameters, which have to be estimated. Hal developed novel techniques for estimating neural network models and derived their statistical properties in a number of papers, including **“Some Asymptotic Results for Learning in Single Hidden Layer Feedforward Network Models”** (“Journal of the American Statistical Association,” 1989). These fundamental contributions to neural network theory have had a big impact in the cognitive sciences, medicine, engineering and psychology. But what impact have they had in the field of econometrics? For one thing, artificial neural networks now have their own JEL number, C45. Further, neural networks play a major role in the crucially important literature on testing for the correct functional form of a model. Suppose that we want to test whether a linear model is correctly specified for the conditional mean. In this case, we want to have a test that is able to detect all possible departures from linearity, including small ones. A test that is able to detect any generic deviation from the null hypothesis is said to be “consistent.” If the linear model is correctly specified, then the error is uncorrelated with any arbitrary function of the regressors. How can we approximate any arbitrary function of the regressors? With a neural network, of course, as they are capable of approximating any generic function. A very nice example of the use of neural network in testing for the correct functional form of a model is Hal’s paper with T. H. Lee and Granger entitled **“Testing for Neglected Nonlinearity in Time-Series Models: A Comparison of Neural Network Methods and Standard Tests”** (“Journal of Econometrics,” 1993).

Nowadays, a new branch of economics, labeled neuro-economics, is rapidly gaining momentum. The objective is to study the link between the functioning of the brain and economic behavior. For example, which part of the brain controls our behavior when playing the stock market? Which characteristics of the brain make an individual a “better” player in the stock market? There is little doubt that in the near future, neural network theory will play a major role in the formalization and in the development of neuro-economics.

#### 4. Reality Check and Data Snooping

**“A Reality Check for Data Snooping”** (“Econometrica,” 2000), is one of the most (if not the most) influential papers in the study of financial econometrics, as well as in forecasting, over the last few years. Begin with a “benchmark” model, typically the most popular model, or the easiest to estimate, and consider a (potentially long) list of competing models. Assume that we want to test whether there exists at least one competitor that truly outperforms the benchmark. Hal starts from the observation that if we use the same dataset to sequentially test each model versus the benchmark, then eventually we are sure to find one or more models that beat it. This is because of the well-known “data-mining” or “data-snooping” problem associated with sequentially comparing many models using classical statistical testing approaches. That is, we will eventually find a model that, simply due to luck, appears to be superior to the benchmark. Hal provides a novel solution to this problem. By jointly considering all competing models, his reality-check procedure ensures that the probability of rejecting the null when it is false (i.e., the probability of a false discovery) is smaller than a prespecified level, around 5 percent.

Evaluation of asset trading rules has been one of the most challenging issues in empirical finance. An investor can choose from a very long list of trading strategies. She may want to pick the strategy giving the highest return. However, because of the data-snooping problem, she may simply pick a strategy that by luck appears to be successful, but it is truly not. Hal’s Reality Check provides a formal way of choosing among trading strategies, controlling for the probability of picking “winners” just because of luck. This idea is clearly illustrated in his paper with Ryan Sullivan and Allan Timmermann, entitled **“Data Snooping,**

**Technical Trading Rule Performance, and the Bootstrap**" ("Journal of Finance," 1999).

## 5. Causality and Structural Modeling

In recent years, Hal's interest has also focused on the issue of measuring causal effects in very general settings. This is one of the most challenging problems in econometrics and statistics. Suppose that we want to evaluate the effect of an increase of police per capita on the crime rate. However, the crime rate may also increase in areas because of urban decay, which may be impossible to properly measure, and police per capita may be (positively or negatively) correlated with urban decay. Disentangling such cause-effect relationships is a problem that has been addressed numerous times over the last 100 years, and the problem remains vexing and complicated.

Exactly how can we carry out valid statistical analysis of the sort needed? The difficulty is that we need to measure the effect of a cause or treatment that is "endogenous" – that is, the cause of interest (police per capita) is correlated with unobservable drivers (urban decay) of the response (the crime rate). The two most common solutions to this problem are the use of instrumental variables (the use of variables that are correlated with the observable cause but independent of the confounding, unobservable cause or the "error"). The second approach consists of finding control variables, such that the endogenous cause, conditional on the control variables, is independent of the unobservable causes. There is growing consensus that the latter approach is preferable. However, it is often difficult to find adequate control variables. In this case, one has to rely on the instrumental variable approach. Still, there is a problem, as this approach works only for separable models, in which the error enters in an additive manner; the unobservable causes do not interact with the observable causes.

In one of his recent important works in this area with Karim Chalak and Susanne Schennach entitled "**Estimating Average Marginal Effects in Nonseparable Structural Systems**" (2011), Hal studies the case of nonseparable models, in which the effects of unobserved causes cannot be separated from those of the observable endogenous causes. They consider a different route to evaluate the marginal effect of an endogenous cause on the response variable via use of the ratio of the marginal effect of the instrument on the response variables and the marginal effect of the instrument on the endogenous cause. In particular, they provide sufficient conditions on the structure of the model for the validity of the approach, and they develop a novel estimator. There is little doubt that this work will have a large impact on empirical microeconomics, as it considers very general and realistic settings. In another recent work with Stefan Hoderlein entitled "**Nonparametric Identification in Nonseparable Panel Data Models with Generalized Fixed Effects**" (2011), Hal is also considering identification of marginal effects in nonseparable panel data models with non-additive fixed effects. This is a daunting challenge, and their results are bound to open new frontiers in both the nonparametric identification and the nonlinear panel data literatures.

In other recent work with UC San Diego Ph.D. Xun Lu, ("**Granger Causality and Dynamic Structural Systems**," 2010), Hal shows that Granger causality is not devoid of true causal content. Instead, as Hal shows, it is equivalent to true structural causality under well defined conditions.

Hal also has numerous other recent papers on testing, estimation, causality and prediction, and we are remiss in not including them in our brief discussion, as many of these will likely turn out to be seminal pieces. We shall leave the discussion of them for the next time!

Both Valentina Corradi and Norman Swanson were students of Halbert White. Dr. Corradi is now a professor of economics at the University of Warwick and Dr. Swanson is a professor of economics and director of graduate studies at Rutgers, The State University of New Jersey.

# Economics

## IN ACTION

### STUDENT RESEARCH

## Valuing Research

### *Undergraduates Reflect on the Senior Essay Seminar Experience*

By Katie Magallanes

The Senior Essay Seminar, Econ 191A and 191B, is two-quarter course sequence required for departmental honors, designed largely to prepare students for graduate study. But it also provides several other – perhaps unexpected – benefits, including attracting employers in today's tough economy.

#### Research Questions

The course begins with an application process. Students choose their research from an amazing breadth of topics. This year's students pursued the following areas with remarkable success.

- Financial markets: What is the effect on the markets of high frequency trading by hedge funds using computerized trading schemes? Can an investment strategy based on the leading opinions of individual investors or mutual funds outperform the averages?
- Microfinance: How successful is small scale lending to the poor of less developed countries?
- Sporting events: How does the variability of a baseball player's performance affect his salary? How do major sporting events (like the Olympics and World Cup) affect tourism in the host country in following years?
- Money and macroeconomics: How does entering the labor market during a recession affect lifetime earnings? How do floating versus fixed exchange rates affect the economic success of countries during the recent financial crisis?
- Policy questions: How does the defense budget affect the growth of the U.S. economy? What are the economic determinants of an individual's willingness to pay for greenhouse gas abatement?
- Offshoring and outsourcing production by U.S. firms
- U.S. charities: How are they supported? How do they choose their specialty?

We asked several students who participated in the seminar what they gained that was unexpected, and here is what they had to say.

#### Interaction with Faculty

Students praised the seminar for giving them the opportunity to interact closely with faculty. Julia Yao, a management science student set to graduate in spring, felt that she was able to develop "a great relationship" with her advisor, Professor Famulari. For recent management science alumna Karina Litvak, the seminar was "an incredible experience from the very beginning ... Professors from the department provided guidance and support" while students learned more about the faculty's professional paths and research.

#### Personal Rewards

Julia echoed the sentiment of other students when she described the Senior Essay Seminar as "the most rewarding class" of her entire college career. Her motivation to enroll was to obtain research experience and to help her decide whether to go to graduate school, but what she gained was "that and so much more." She developed her quantitative skills and was also nominated to present at UC San Diego's annual Undergraduate Research Conference.

Other recent graduates were pleasantly surprised at the personal



Julia Yao

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benefits derived from the seminar. Tammy Weng did not anticipate the depth of learning: “The sense of wonderment and truly understanding the feeling that the more I learn, the more I learn that I don’t know ... I learned how expansive economics is.” Molly Novasel considers the Senior Essay Seminar to be “the most beneficial experience” she had while at UC San Diego: “In an academic setting that focuses on theoretical concepts, it is incredibly enlightening to do something practical to apply in the working world.”

Molly was also struck by “the talent [the seminar] gathers in one room. All the other students in the course have amazingly insightful and interesting ideas.” She “looked forward to this class more than any other to listen to all the great ideas.”



*Molly Novasel*

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## Skills Gained

Students developed a variety of invaluable skills and a deeper understanding of economics. Karina “gained many skills: problem solving, quantitative analysis and professional writing.” She “learned how to ask the right questions, how to anticipate complications, how to interpret regression results and much more.” Although many of these skills were addressed during the econometrics series, Karina stated that “nothing helps learning like doing your own project. I also became much better acquainted with STATA.”

Management science student Lucy Huang also gained from the intensity: “I didn’t expect to apply so much of what I learned from my economic classes. For example, I was familiar with STATA from completing homework assignments for econometrics classes. However, actually creating a model by myself and running it through the program was a new and very educational experience for me.”

Elliot Marks, also majoring in management science, pointed out how the project overlapped with his other commitments: “In leading a discussion section for Econ 100A, I helped introduce the implicit function theorem and a Jacobian matrix to students. As a student in Econ 172B, I used the Jacobian matrix as a piece of a Bordered Hessian matrix to determine if an optimal point was a constrained minimum or maximum in more complicated optimization problems.”

## Standing Out in the Job Search

One of the most powerful benefits of the Senior Essay Seminar was how it helped students during their job searches. Karina, who graduated in March, used the research project as a tool to find a job: “Every employer that responds to my job application asks me about this project and is impressed when I provide details of my research.” Karina had the opportunity to present her project at the Undergraduate Research Conference, which is also a point of interest for employers: “Some companies ask for a research writing sample. After I attach my completed research paper, the company contacts me in less than a week.”

Elliot also found his research to be integral to the favorable impression that he made: “When talking with potential future employers – at info sessions, career fairs or in interviews – the paper I am working on in 191 is always a part of the conversation. Most of the interesting employers that recruit undergraduate economists for entry level positions like to see some experience with research. At the UC San Diego job fair this quarter, I had about a 15-minute conversation with a representative from NERA Economic Consulting about the paper I was working on. The experience I am gaining from the (incredibly time-consuming and intellectually-demanding) 191A-B series definitely helps me provide concrete evidence to differentiate myself as a strong candidate for many positions in my job search.”

Management science student Lucy Huang confirmed that “employers tend to be impressed by the personal drive and motivation necessary to complete such a project.” In responding to their questions about what distinguishes her from other candidates, Lucy could confidently say, “I am part of this program and have experience conducting research that will be used to answer an interesting economic topic.”

Julia, who accepted a position as a Research Associate at NERA Economic Consulting and plans to work for a few years before going to graduate school, learned that having created her own research paper made her “stand out from the rest.” She has been able to discuss the paper with every single employer she has met or interviewed with. “They are always interested to hear more about the analytical techniques and processes I used to conduct my research.”

Tammy Weng graduated last year and is now in law school. Her thesis gave her the edge even in the legal profession: “For the first summer of law school, most students either decide to work in a law office, for public interest organization or extern for a judge. I decided to go for the last one. I had my thesis on my resume and was asked about it on all interviews, including the one for the job I currently have for this

summer.”

Molly had an even more direct experience resulting from the seminar. She accepted an internship in home energy management just after she was admitted into Econ 191A. Molly wanted to have a positive effect on the environment and believed the best way to do so was to help decrease energy use through demand-side management techniques. She immediately put her work in the seminar into action: “The first thing that went through my mind was ‘What better way to impress my colleagues than by presenting research that can help the company?’ So, I chose to do a forecast of energy use dependent on specific demographic factors in order to create target populations for the company to advertise and sell to. After finishing my first draft in December, I immediately gave the document to my [internship] advisor who was very impressed with some unexpected things. She said my writing had a nice mixture of analytical yet conversational aspects, while my research was very practical and useful to the research and development of our marketing strategy. Only one month after reading the document – to my complete surprise – I was offered a job in which I would bridge the gap between analytical researcher and marketing journalist. In other words, I would be able to conduct research experiments to improve production, but at the same time write press releases and articles for our marketing department.

“The relief of getting a job offer in today’s economy is inexplicable, and I am unsure whether I would have received the offer without having produced the research paper. It is a very unique way to show employers, graduate schools and professors that you are truly passionate about a specific topic. Skills that you may not even realize you have are revealed ... and rightly so considering all that can be said in 10,000 words!”

### **Paving the Way for Entrepreneurs**

Alexander Wallin, an economics major who just completed his project, had a similar experience to Molly. He saw the Senior Essay Seminar as the “perfect way” to apply research tools to his idea to see “if it would hold in reality.” Pleased with the outcome of the project, he decided to present the results to several investors in order to build a business on his idea. Since then, Alexander has received more than \$300,000 in funding to start his own business. Alexander hopes his success will “inspire more entrepreneurs” like him to apply the “useful tools ... learned ... at UC San Diego and test their own ideas.”



*Alexander Wallin*

### **Preparation for Graduate Study**

Another aspect of the Senior Essay Seminar is to help students prepare for graduate school and to determine if further study is right for them. Karina “learned the way professional researchers think about their work.” For joint math and economics major Tom Tang, “the primary benefit of taking this course is that it enables students to really consider whether a career in academia is right for them.”

Tammy found advantages for her law studies: “All first year law students are required to take a legal research and writing class where we are given a hypothetical situation/story. We are then tasked with flushing out all legal arguments and ‘serve as counsel’ for a side and write a legal paper on all the possible legal arguments and assess their strengths and weaknesses. Writing this paper requires us to do legal research on Internet databases, which I was able to master much faster because of my thesis at UC San Diego.”

### **Advice**

Although students acknowledge the hard work and effort that goes into the Senior Essay Seminar, they greatly value their experience. Karina described the seminar as “difficult, more difficult than I had expected. However, it was also my most rewarding undergraduate experience.”

Tammy has the following advice for students interested in completing a senior essay: “First is to research, research, research because there is so much information out there on your topic – more than you know. This class is extremely hands off and so the work and the motivation have to come from the student. There is no professor with a strict syllabus and a reading assignment every week. Time management is key! At the same time, students need to understand that there’s only so much we students can do with our rudimentary understanding of economics and to understand how much you can truly take on.”

According to Molly, “it is an honor to be a part of such a talented group of students,” and she would “highly encourage everyone else to take the course.” Karina enthused, “As my advisor wrote in an email once the project was complete, ‘Econ 191 – the class that just keeps giving!’ This statement is absolutely

true. The class was an amazing experience, and I am immensely proud of myself for having done this. All the difficulties and setbacks were absolutely worth the finished product. I am grateful for my brilliant advisor and to the department for offering us this opportunity.”

The Senior Essay Seminar has grown in popularity in recent years and we have been offering two sections of the course to accommodate the increased demand. Admittance to the Senior Essay Seminar is by proposal only; proposals are submitted each spring.

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# Economics

## IN ACTION

### STUDENT RESEARCH

## Two Trips to Omaha: Meeting Warren Buffet and the Global Investment Research Challenge

By Michael Willoughby and Linda Xie

The Undergraduate Investment Society (UIS) is the largest student leadership organization on campus. Founded in 2005 by economics major Ann Ko, it is dedicated to empowering students through financial literacy. UIS produces bimonthly workshops and has implemented a program that helps local high school teachers introduce basic financial concepts in their classes.



### In Omaha with Warren Buffett

Last fall, UIS was honored to be invited to Omaha, Neb., by the "Oracle of Investing," Warren Buffett. Mr. Buffet is the third-richest man in the world. Despite the fact that his advice is sought after by corporations, celebrities and central bankers worldwide, Mr. Buffett remains a very modest man and an inspiration to young people around the world.

In October 2010, 20 UC San Diego students toured Mr. Buffet's hometown; the headquarters of his flagship company, Berkshire Hathaway; and its first acquisition – the Nebraska Furniture Mart, an impressive factory and outlet on 27 acres. The tour ended with a private Q&A session and photo opportunity with Mr. Buffett. Students were impressed with the breadth of his knowledge and the compassion of his wisdom.

Everyone was inspired by Mr. Buffet's clear and optimistic outlook. He told students that when he was eight years old, he had already finished reading every single book on investment in the Omaha Public Library. He also mentioned that he never uses contracts during business deals; he believes that people should not wake up in the morning because they are contractually obliged to, but rather because they enjoy what they do. He emphasized that the nature of his success has been to invest in the people "at the company" not the "product of the company." And he told students that the best class he ever took was a

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Dale Carnegie course that improved his public speaking skills (which he used to propose to his wife).

The tour ended with lunch at Mr. Buffet's favorite restaurant, Piccolo Pete's, where he regularly enjoys his favorite meal; a steak and a root beer float.

## The Global Investment Research Challenge

In December, five UC San Diego students – two UIS undergraduates, Kamron Farman-Farmaian (joint mathematics and economics) and Sean Lawson (management science), plus three UC San Diego Rady School of Management M.B.A. students – took the stage in the southwest regional qualifying round of the **Global Investment Research Challenge** (GIRC). This annual competition is sponsored by the Institute of Chartered Financial Analysts (ICFA). After winning the initial round, the team returned to Omaha, Neb., in April for the 2011 Americas Regional Final.



Thirty-two universities from Buenos Aires, Argentina, to Ontario, Canada, began the competition. UC San Diego won their quarterfinal match, defeating Georgetown University, and advanced to the round of 16. Unfortunately our team lost to the University of Wisconsin-Madison in the semifinal round. In the finals, University of Southern California advanced from the Americas Regional Final to face the Asian and the European champions for the Global title. The 2011 Global winner was Politecnico di Milano from Italy.



## Financial Horizons Conference

UIS hosts an all-day Financial Horizons Conference every February. The 6th Annual Financial Horizons Conference was held on February 26 and was attended by more than 400 UC San Diego, San Diego State University and University of San Diego students. This year's keynote speakers were Alex Sun, CEO of Mitchell International, and Tom Fleming of Goldman Sachs. Mr. Fleming, a Williams College graduate, earned his doctorate in mathematics from UC San Diego.

STAY CONNECTED





# Economics

## IN ACTION

### STUDENT RESEARCH

## Exploring Motivations and Tools That Encourage Giving

### *Schools and Nonprofits*

By *Laura Gee*

The problem of under-provision of public goods is among the oldest and most widely studied market failures in economics. Recently economists have been thinking about this problem from a more real-world perspective. For example, imagine you live in an apartment complex. All the residents contribute to comfortable and clean communal areas (the public good), and they know that taking out their garbage and turning down loud music at night contributes toward the communal living area. So, there is a clear understanding of the efficient allocation of the duties involved for optimal provision of this public good, but how might these residents create a governance scheme to make sure everyone follows through on a fair share of these duties?

### Vigilante Justice vs. Gun-for-Hire

One option is vigilante justice (if my neighbor has a loud party, I leave my garbage on her doorstep). Another is to use a third party. In my apartment complex, we have a superintendent. We pay the superintendent to use fines to punish those residents who throw loud parties. My work with James Andreoni tests whether subjects in an experimental setting will choose to hire a third party to help them better provide a public good. We find that our gun-for-hire mechanism is implemented more than 70 percent of the time and crowds out vigilante justice.

After finding a mechanism for better public provision in the lab, it seems natural to wonder about public good provision in the real world. In particular, my other research concentrates on charitable contributions to nonprofits.

### Gifts of Time

Nonprofits depend upon charitable gifts as a means to provide services to the public. To continue or to expand these services, nonprofits would benefit from a better understanding of the relationship between gifts of time (volunteering) and gifts of money. Much of the previous research in the nonprofit sector has concentrated on gifts of money, but gifts of time are important in their own right. Many Americans engage in volunteering. In fact in 2009, 7.2 percent of the U.S. population engaged in volunteering on an average day and those who did volunteer spent 2.11 hours engaged in that activity ([PDF: Bureau of Labor Statistics, "American Time Use Survey 2009 Results," Table A-1](#)).

To begin to look more closely at gifts of time, it may be easiest to explore a single specific setting, such as a school. Time contributions produce a public good (improved school quality for all students) and private benefits (better class placement for my own child). If private benefits increase with the number of children a set of parents has enrolled at a school and parents value these private benefits, then the level of contribution should be affected by the number of parents' own children enrolled at a single school. Using a nationally representative sample of more than 2,500 multichild households, I find evidence that time contributions rise with number of own children enrolled in the same school, which implies that households do get private benefits from volunteering ([Gee, "Nonprofit and Voluntary Sector Quarterly," April 2010](#)).



*Laura Gee is a fourth year graduate student in the Department of Economics Ph.D. program. She is the recipient of the Walter P. Heller Award for Outstanding Third Year Paper, the Women's Philanthropy Institute's Dissertation Fellowship 2010 and is a Cote Robles Fellow.*

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## Future Research

Building upon this better understanding of how households view gifts of time, the natural next step is to build up a model of gifts of both time and money. My current research is beginning to attack this question using a mixture of both experimental and empirical approaches.

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# Economics

## IN ACTION

## Economics Leadership Council Set to Break New Ground

*By UC San Diego Social Sciences Office of Development*

The newly formed Economics Leadership Council (ELC), established by the department of economics, partners with top business leaders, including UC San Diego alumni, to work on new projects and initiatives. "It's nice to see the department thinking strategically about its current and future role and reputation," said council member and alumnus Mark Hoffman. "They are considering how that translates into new or enhanced requirements and services to support students and alumni."

### Diversity of Members

The council is an important step in being inclusive in this process. "We are bringing together a diverse group of people who can contribute in different ways," said Doug Kurtz, director of development for the social sciences. "We have Ph.D. alumni, undergraduate alumni and general community members involved. What is common to them, and what is exciting about this opportunity, is that everyone wants to help elevate the quality of the department and increase the meaningfulness of a UC San Diego degree in economics."

ELC members represent a broad business spectrum, from investment and commercial banks to economic consultants to major regional firms such as Qualcomm and Sempra. The council also has members from outside of Southern California who participate remotely. "We have members who live and work in San Francisco, New York and Europe," said Kurtz. "While this presents a logistical challenge to engaging with them, we are using video conferencing and email, and the response has been positive. Their involvement is important, as these people provide a very valuable business perspective."

### Strategic Areas

Members are working with department leadership to set the council's agenda. "We are delighted to have their energy, ideas and lively conversations in helping us chart a course for the future in some of our strategic areas," said Julian Betts, chair of the department. In early conversations and at the inaugural meeting, council members have shared several ideas that have coalesced into a set of focus areas. "It would be great to have more local business support with the department," said Emmy Sobieski, an inaugural member. "It would also be great to have more awareness of potential career paths that students can follow with different economics degrees and concentrations."

Other focus areas include creating stronger alumni connections, forming strategic partnerships between private industry and the department and increasing the marketability of a UC San Diego economics degree for both graduate and undergraduate students. ELC's greater ambitions may create future goals as well.



*Mark Hoffman is looking to use his consulting background to bridge industry and academia, and to engineer hands-on learning opportunities for students.*



*Emmy Sobieski, CFA, worked at Oppenheimer Funds in New York for much of her career. Assisting students and conveying the value of a UC San Diego economics degree, particularly with hiring firms, are*

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## Alumni: Continued Education and Support

*two areas of interest.*

As for why alumni are stepping forward to serve, there seems to be a common interest in wanting to give back to help the department. As Hoffman put it, "I'd like to give something back, but hopefully in a way where I can have more impact. Believe it or not, cultivating an economic way of analysis and thinking has led to many opportunities for me educationally and career-wise, and it's gratifying even to teach it to corporate executives in a strategic marketing program that I help facilitate. So, beyond the math, equations, cost and supply and demand curves and isoquants, there's other value in economics. I hope that by joining ELC, I will be able to continue some of my education, challenge my thinking and bring some outside perspective."

The individual council members have pledged philanthropic gifts to help the department along with their service on the council. At a time when resources are greatly stretched, their generosity and assistance is tremendously valuable, and we are very grateful for their support.

To learn more about ELC, please contact Doug Kurtz at [dpkurtz@ucsd.edu](mailto:dpkurtz@ucsd.edu).

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# Economics

## IN ACTION

## Job Market Proves Strong for Our Doctorates

### *We Did It Again*

By Julie Cullen

This year we had an unusually large group of graduate students (19) seeking positions as economists. This was perhaps the most striking feature of the market: Many of the leading departments had similarly large cohorts of candidates. The spike in supply seems to be attributed to the addition of previous years' students who chose to delay entering the market in hopes that the economy would recover.

The good news is that demand had rebounded somewhat. Many institutions that were off the market last year were back on, but many with only one open slot rather than the several as in more robust years. Institutions also seemed to interview and fly out more individuals per slot than in past years. This change led to an active but uncertain and drawn-out market for participants. Despite the challenging conditions, our candidates had superb outcomes.

#### **Half of the students will be starting careers as academics at leading national or international institutions:**

This set includes both behavioral and experimental economists: Charlie Sprenger was courted by several top departments and ultimately decided to join the faculty at Stanford University, and David Eil also had an attractive set of options and chose to accept a position at George Mason University. Two other microeconomists who specialize in game theory, Phil Neary and Elisa Hovander, will be heading off to Royal Holloway, University of London, and George Washington University, respectively. Cynthia Wu, a macroeconomist who had broad success on the market, accepted an offer from the University of Chicago Booth School of Business. Our lone environmental economist, Ben Gilbert, is joining the University of Wyoming, which is particularly strong in his field. Our lone econometrician, Min Kim, is heading north to Ryerson University in Toronto. International economist Oana Hiraikawa found a great match with a position at Claremont McKenna College. Youjin Hahn and Hee-Seung Yang, who recently married and both specialize in public economics, will be moving to one of Australia's premier institutions, Monash University.

#### **The other half chose positions in first-rate government or private-sector institutions:**

Four of our students working in macro and finance – Ayelen Banegas, Will Peterman, Alberto Rossi and Cindy Vojtech – all secured coveted positions at the Federal Reserve Board. This has to be a record! Two others headed for Washington, D.C., are labor economist Tiffany Chou and international economist Danielken Molina, who have accepted positions at the U.S. Department of the Treasury and the Inter-American Development Bank, respectively. Jess Diamond, who is an expert on the Japanese economy, landed a position at the Bank of Japan. This year two students chose private-sector positions that competed effectively with their academic options: Sarada, an expert on entrepreneurship, is joining Cornerstone Research, and game theorist Chulyoung Kim will be returning to Korea to work at the Korea Information Society Development Institute.

All in all, this was a very successful job market, thanks to the students' hard work and the faculty who have supported them throughout their time here at UC San Diego. Most students found positions that were very close to their first or best choices. This is remarkable given how stiff competition was this year, and is strong evidence of the high value the market places on a doctorate in economics from UC San Diego.

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## Grace Chui-Miller

### *Ready to Compete in Any Arena*



Grace Chui-Miller likes to look beyond her boundaries and explore the variety of opportunities in her environment. Her mentor, the late Muir College provost and mathematics professor Patrick Ledden, had a love of public art and literature and, similarly, Chui-Miller pursued her writing interests while earning her degree in quantitative economics and decision sciences at UC San Diego.

#### Undergraduate Experience

"UC San Diego helped me realize that who I am matters," Chui-Miller said. "More than just learning economic theory and facts, my experience at the university taught me how to think, how to question and how to analyze."

One of the most important aspects of Chui-Miller's extracurricular life at UC San Diego was at the "Muir Quarterly," first as a reporter, then

in her senior year as editor-in-chief. She credits that experience with giving her access to people and ideas that she wouldn't have had otherwise, including weekly meetings with Dr. Ledden. "Dr. Ledden taught me that if you take advantage of all the tools a university like UC San Diego has to offer, you will prepare yourself for your life beyond campus," she said.

#### Professional Development

Five years ago, Chui-Miller cofounded Correlation Ventures, a venture capital firm in San Diego where she is chief financial officer responsible for all financial reporting and operational aspects of the company. She also oversees investor relations, providing financial information, monitoring current investee companies and investigating prospective investments. She joined Correlation Ventures after serving as chief financial officer of Doll Capital Management in Menlo Park.

Chui-Miller began her journey to the venture capital world in an unusual way. In her junior year, a posting at UC San Diego's Career Services Center offered an internship at KPMG. Even though she was not an accounting major, Chui-Miller applied and discovered it was an old posting. "The person who had originally posted the job had been promoted, but he took my call and I ended up with the internship – the first time they had ever hired an intern with no accounting background," she said.

For eight years after graduation, Chui-Miller held a management position in the assurance department at KPMG, where she oversaw audit engagements and was involved with SEC filings and asset-backed securitization transactions. "During my time there, KPMG continued to hire non-accounting majors," Chui-Miller said. "Knowing how to work hard and feel confident in my abilities helped me succeed in a very competitive environment."

While at KPMG, Chui-Miller completed her M.B.A. at the night program at UCLA Anderson School of Management. Traveling by train to and from UCLA several times a week while holding a full-time job required dedication and concentrated effort. But succeeding in a highly competitive environment was not new to Chui-Miller, and she credits her experience at UC San Diego for preparing her well. "I was competing with the best and the brightest at UC San Diego," Chui-Miller said. "These were very smart, well-rounded students who had clear goals and plans for how to reach them."

#### Giving Back

While at UC San Diego, Chui-Miller was also very involved in the business fraternity Alpha Kappa Psi,

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which helped prepare its members for post-collegiate life by organizing activities such as mock interviews, but Chui-Miller says the group also taught the importance of giving back. “We participated in community service projects like helping to repaint a school because the district didn’t have the means to do it,” said Chui-Miller. “It was heartbreaking and heartwarming at the same time to see students and their families come out to help improve the atmosphere where their learning took place.”

Chui-Miller continues to remain active in the alumni chapter of Alpha Kappa Psi in San Diego, as well as in ATHENA San Diego, which promotes professional growth for women executives and rising managers in science and technology. She also is making plans to mentor economics students at UC San Diego. “With the severe funding crisis throughout the educational system in California, UC San Diego needs the help of its alumni now more than ever,” Chui-Miller said. “UC San Diego helped us develop into who we are today. We must give back in whatever way we can.”

As a wife, mother, career woman, community volunteer and triathlete, Chui-Miller has focus, success and balance in her life. She concluded, “My education at UC San Diego was a stellar bargain and top-notch. Thanks to UC San Diego, I can be myself.”

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# Economics

## IN ACTION

## Chair's Corner

Welcome to this edition of "Economics in Action." In each edition our goal is to convey several aspects of the happenings in the Department of Economics in addition to original commentaries such as [Professor Valerie Ramey's lead article](#) that provides some fascinating empirical evidence testing the notions in the recent controversial bestseller "Battle Hymn of the Tiger Mother."

### It's Hal White's Birthday!

Valentina Corradi and Norman Swanson, who graduated from our doctoral program in 1994, contribute a wonderful article in this issue [highlighting the research contributions thus far by Hal White](#). Valentina, Norm, Shinichi Sakata, Graham Elliott and Allan Timmermann, along with department staff member Briana Weisinger, have worked tirelessly on a festschrift celebrating Hal's 60th birthday in May, which will reunite many of Hal's students, colleagues and co-authors for a conference in his honor. The conference is of course really just an elaborate ruse so that we can hear Hal play with his band. We will report on the festschrift in the next issue of "Economics in Action."

### Kudos

We congratulate Professor Valerie Ramey and Ph.D. alumnus Neville Francis (now an associate professor at the University of North Carolina at Chapel Hill) for winning the 2011 American Economic Journal Best Paper Prize for "A Century of Work and Leisure," published in July 2009. The work was selected as the best article published in the last three years in "American Economic Journal: Macroeconomics." The paper is available [free online](#).

Congratulations to Professor Gordon Dahl and Professor Valerie Ramey for their separate papers just published in the "Quarterly Journal of Economics." Gordon's work with David Card in the paper "Family Violence and Football: The Effect of Unexpected Emotional Cues on Violent Behavior" has received widespread media attention.

We also congratulate Professor Karthik Muralidharan for winning a Spencer Foundation Postdoctoral Fellowship, which will allow him to devote the next academic year entirely to his research on the economics of education in a developing country context.

UC San Diego has its own set of awards, and our professors have recently received a number of these. For instance, the Hellman Fellowships are granted on a highly competitive basis to help promising UC San Diego assistant professors to further their research. This spring three of our assistant professors – Davide Debortoli, Prashant Bharadwaj and Mark Jacobsen – won this award. Adding these three to Irina Telyukova, who won a Hellman Fellowship last year, and Nageeb Ali, who won two years ago, our department has now won five of these fellowships in the last three years. This number exceeds the total number of Hellman Fellowships awarded to department faculty in the preceding fourteen years. Surely some of this upward trend indicates the exciting work that our assistant professors are currently doing.

We also congratulate Prashant Bharadwaj for winning a 2011 UC San Diego Sustainability Award for teaching that touched upon environmental sustainability.

### Undergraduate Program

We have lots of exciting news at the undergraduate level as well. The department continues to be the choice of roughly one out of ten undergraduates when choosing a major. Class sizes are inching upward and we do our very best to deliver a quality undergraduate education to our students, in spite of several years of budget cuts.

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Please see [Dr. Michael Willoughby and Linda Xie's article](#) highlighting the exciting work of the Undergraduate Investment Society and the tremendous success that two of our majors recently had in the Global Investment Research Challenge. The entire department values Dr. Willoughby's work with our undergraduate in activities such as these, in addition to his first-rate teaching.

You may also be interested in reading [student testimonies on the value of the undergraduate Senior Essay Seminar](#). Many professors have taught this course over the last decade. We owe a special debt of gratitude to all of them, and in particular to Vice Chair Melissa Famulari for the efforts she has put into running this course in some years, and for helping to expand the program.

## Graduate Program

We had the largest number of applicants to our doctorate program: 692! In fall 2011, 30 new students entered our highly ranked program. This is due to the hard work of five faculty members who make up the admissions committee chaired by Yixiao Sun. Committee members are Patrik Guggenberger, Silke Forbes, Davide Debortoli and Paul Niehaus as well as several support staff. And once again, the department's Open House was a hit with visiting admits (36) from across the nation due to a fantastic collaboration between faculty, current graduate students and administrative staff.

Even in this challenging employment market, we are proud to have been able place all students (100 percent placement rate again!) on the job market: This year 20 graduating Ph.D.s went to various positions, including academia, federal government and other nonprofit agencies (e.g., Alaska Fisheries Center) and economic research consulting firms. Detailed information about placements can be found in the [article written by Job Placement Director Julie Cullen](#).

Finally, we are pleased with our new vice chair of graduate studies, Gordon Dahl, who really hit the pavement running in working with faculty and staff to maintain our top-ranked program and to best serve our 119 current graduate students.

## Outreach

Elsewhere in this newsletter you will find an [article introducing the Economics Leadership Council \(ELC\)](#). This newly formed council of business leaders, many who graduated from our department, will seek to foster closer ties between the department and the community and to help the department plan for the future. We are grateful to each ELC member for making a generous financial donation to the department; an even more important gift is the time that they are already devoting to helping the department to highlight its undergraduate and graduate students in a broader community. I and other members of the department have worked closely with Social Sciences Director of Development Doug Kurtz to create the ELC. The department is grateful to Doug for his work on this initiative.

The department would particularly like to thank Ken and Jennifer Kroner, whose quiet generosity is terrific to behold. They have just made a substantial gift to the department and a permanent endowment to the Division of Social Sciences, both designed to help us attract the best graduate students. Their gift has already made a difference: This fall's entering class will feature Kroner Fellows, the first of many.

Professor James Hamilton continues to direct the Economics Roundtable speaker series. So far this year the Roundtable speakers have included Victor Nichols, CEO of Experian North America and graduate from our economics bachelor's program, and academic superstar Barry Eichengreen from Berkeley. You can learn more about this series including upcoming speakers [here](#).

At the American Economic Association Annual Meeting in Denver in January, the department hosted a reception for alumni and friends of the department. Every year that I have hosted this event, attendance has grown, to the point where this year perhaps 75 people attended; a happy buzz from old friendships with other alumni and with faculty filled the reception room.

On a more sober note, as chair I have noticed that one of the most common questions from alumni is about the budget situation in California. Certainly there is little good news out of Sacramento these days, but as my macroeconomist colleagues remind me, a good chunk of the problem reflects the extended recession, and so things will improve over time. However, there has been a downward trend for more than a decade in the share of state revenue in the overall budget of the University of California. For instance, since 1990 the percentage of the cost of education that is paid for by the state has fallen from 78 percent to 58 percent today. The upshot has been large increases in tuition and limits both on enrollment and on faculty hiring.

In times like these, the department is especially appreciative of donations that friends and alumni have made. We have used some of these donations to create endowed chairs, to support our various seminar series, to subsidize several undergraduate organizations (although we would like to be able to do much more here), to subsidize graduate student summer fellowships, and to create assistance for promising

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students in advanced stages of their thesis through fellowships named after Clive Granger and supported in part by generous donations from Patricia Granger. Please contact Doug Kurtz at [dpkurtz@ucsd.edu](mailto:dpkurtz@ucsd.edu) or me at [econchair@ucsd.edu](mailto:econchair@ucsd.edu) if you would like to learn more about Giving Back possibilities.

## And Now, Back to Work

I find it hard to believe that my three years as department chair are coming to an end on June 30.

I have greatly enjoyed working with my colleagues in the department and throughout the university. During this time we have made real progress in creating a more competitive teaching load for faculty; we have made various improvements to both undergraduate and graduate programs; and we have hired five faculty members while losing only one faculty member. I also believe that the university in general, and our department in particular, have taken some preliminary steps to enter a new, more entrepreneurial period of existence that will do much to counteract the trend of diminishing state funding. If we do this right, we will continue to fulfill our mandate of teaching the most promising undergraduates in California and the most promising graduate students in the world, all the while becoming more self-sufficient and more relevant.

With this exciting agenda in hand, I am delighted to announce that Professor Valerie Ramey will become department chair effective July 1. She will do a great job. I state this with immense confidence, as I know her abilities and those of the fine department staff who will support her efforts.

Sincerely,



Julian Betts, Chair

# Economics

## IN ACTION

# Is There a *tiger mother* Effect?

Time Use Across  
Ethnic Groups



By Valerie A. Ramey, Ph.D.

2011 is officially the “Year of the Rabbit” on the Chinese calendar, but it might be better known as the “Year of the Tiger Mother.” In early January, “The Wall Street Journal” published an article by Amy Chua entitled “[Why Chinese Mothers Are Superior](#),” which summarized her new book, “Battle Hymn of the Tiger Mother.” The article and book set off a wave of commentary and controversy about Chua’s extreme parenting approach, reaching even as far as the Davos summit where Larry Summers commented on the debate.

Chua, a Yale law professor, brought up her daughters in the “traditional Chinese” way, featuring strict discipline and an emphasis on academic success above all else. While she required her daughters to spend hours studying and practicing piano or violin, she prohibited them from watching TV, playing on the computer and engaging in play dates and sleepovers.

Chua’s book has struck a nerve because of the stereotype of Asian academic success. The most recent academic test scores from the [Program for International Student Assessment show that four of the five top-scoring countries are Asian countries](#) (Finland is the non-Asian exception). In California, Asians represent 12 percent of high school graduates, but one-third of admissions to the University of California and almost half of all undergraduate admissions to UC San Diego.

The question that naturally arises is whether Asian parenting is the source of this academic success. Do Asian children spend more time studying and practicing music than children of other ethnic groups? Do Asian parents spend more time pushing their children to academic success?

To answer these questions, I analyzed detailed data from the American Time Use Survey. This U.S. government survey measures the time use of thousands of individuals from 2003 to 2009 based on time diaries, which are considered the most accurate way to measure time use. It includes data on individuals ages 15 and older, so I concentrate on teen time use and parent time use.

### High-School Students’ Time Spent Studying

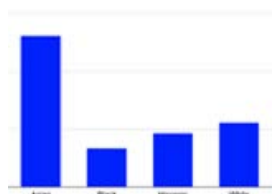


Figure 1. Time Spent Doing

Figure 1 shows that Asian high-school students do indeed spend more time studying and doing homework. The bars show average weekly hours spent on studying and homework by full-time high school students, averaged over the entire year. The average (non-Hispanic) white student spends five-and-one-half hours per week, and Hispanic and (non-Hispanic) black students spend even less. In contrast, the average Asian student spends a whopping 13 hours per week (and recall that this is averaged over summer vacation times as well). Moreover, the differences

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*Homework by High-School Students. Click graph to enlarge.*

become greater if the sample is limited to children who have at least one parent with a college degree. Thus, the educational level of their parents cannot explain the large differences.

These differences in time spent studying mirror differences between the U.S. and Asian countries. For example, in a 1991 “Journal of Economic Literature” paper, Juster and Stafford showed that Japanese high school students spent significantly more time studying than American students.

## High-School Students’ Time Spent on Other Activities

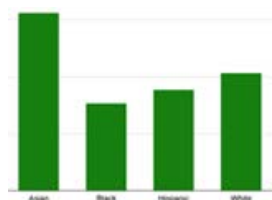
If Asian students are spending so much more time studying, what are they giving up? Table 1 shows time spent in a number of other activities. It appears that the average Asian high-school student is not like Chua’s daughters in all aspects. In particular, they spend no more time practicing and performing music, about the same amount of time watching TV and they spend more time playing on the computer. However, Asians do spend less time on sports and socializing than any of the other ethnic groups. The biggest difference, though, is in time spent working at a job: White students spend 5.8 hours per week on average, and Asian students spend only 2.4 hours. Thus, relative to whites, Asians appear to be spending less time socializing, playing sports, doing chores and working, but spend more time studying and playing on the computer.

**Table 1: Average Hours per Week Spent by High-School Students**

Activity	Asian	White	Black	Hispanic
Studying	13.0*	5.6	3.4*	4.6*
Music practice and performance	1.3	1.3	1.1	1.0*
TV watching	13.6	13.7	17.6*	15.6*
Computer (games and other leisure use)	8.5*	5.6	5.0	4.7
Sports	3.4*	5.1	6.0	4.8
Socializing	5.2*	7.7	7.5	8.1
Household chores	4.6	5.9	4.4*	5.6
Work	2.4*	5.8	4.1*	3.1*

\*Indicates that the average is statistically different from that of whites at the 5 percent level.

## College Students’ Time



*Figure 2. Time Spent Doing Homework by College Students. Click graph to enlarge.*

Do these Asian students coast on studying once they escape the grips of their Tiger Moms? To answer this question, Figure 2 shows study time by full-time college students. The gap is not so extreme in college, but it is still the case that Asian students spend more time studying: more than 15 hours per week in comparison with white students who spend a little over 10 hours per week, and with black and Hispanic students who spend even less time.

## Mothers’ Time

When I first read Chua’s “Wall Street Journal” article, I wondered, “Where does a Yale law professor find the time to engage in such extreme parenting?” My paper with Garey Ramey, “[The Rug Rat Race,](#)” published by the Brookings Institution last year, chronicled the dramatic increase in time spent by educated parents on their children since the early 1990s. Even the average white college-educated parents spend a great amount of time caring for their children and managing their activities. Do Asian parents spend even more time?

**Table 2: Average Hours per Week Spent by Mothers**

	Asian	White	Black	Hispanic
Educational activities with children	1.9*	1.5	1.3*	1.3*
All child care	14.1	14.4	11.0*	11.3*

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*\*Indicates that the average is statistically different from that of whites at the 5 percent level. These averages control for family composition, age and education of mother and marital status.*

Table 2 shows time spent by mothers by ethnic group in education activities with their children, such as reading to them or helping with homework, as well as total time spent on child care. These averages control for differences across groups in the number and age of children, education of the mother and marital status. The numbers show that Asian mothers do spend more time in educational activities, but only a half-hour per week more than white mothers. There is no difference in time spent on all child care between white and Asian mothers, though both groups devote more time than black and Hispanic mothers.

Thus, these Tiger Mothers seem to be able to make their children spend much more time studying without having to spend more of their own time. Perhaps this is what Chua's "Chinese discipline" is all about.

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