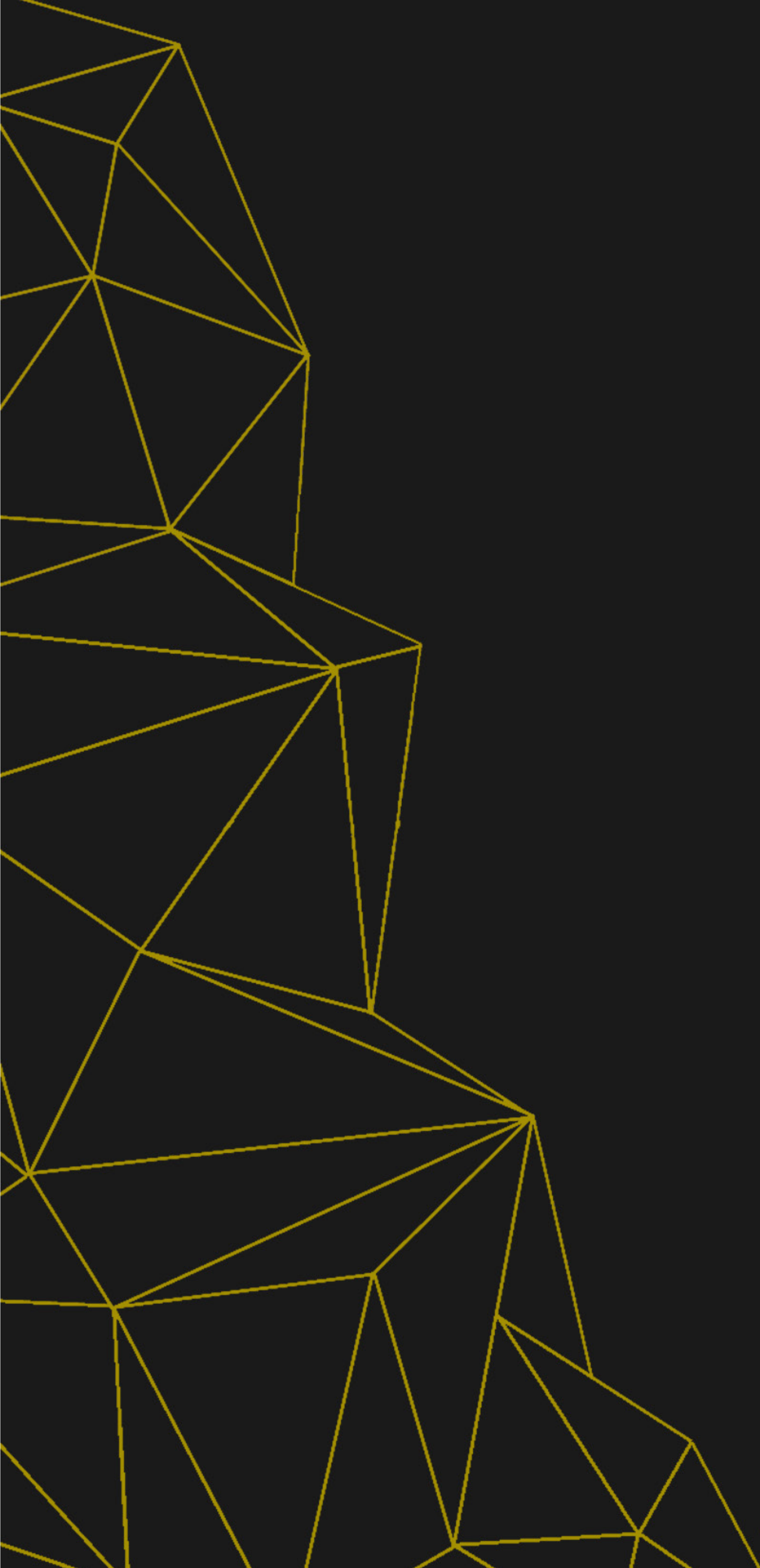

EQUILIBRIUM

UW Madison's Journal Of Economics

Summer'15

Cover Art: Rishika Narala

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The Univeristy of Wisonsin- Madison's Undergraduate Journal of Economics

from the editors

INTRODUCING EQUILIBRIUM

Dear Readers,

The staff of Equilibrium is proud to present the fifth volume of University of Wisconsin-Madison's undergraduate journal of economics. As the publication matures, we continue to foster new relationships, cultivate new talents, explore new fields, all in hopes of serving the students of this beautiful campus. We harbor a multi-dimensional presence. On campus, we see Equilibrium as a platform for economics undergraduates to discover, develop, and showcase their skills. Our team is a motley mix of future business leaders, budding graphic designers, and aspiring writers who have all contributed and learned from this experience. Outside it, our artfully crafted copies are a favorite among alumni; giving them a proud product from their alma mater and helping them stay connected with the department.

What makes us special is our ability to translate academic jargon into readable and entertaining writings to draw the attention of our student body. After all, this is a journal created by and for the undergraduate Economic student. We connect students to faculty and bridge an undergraduate degree with its potential in the real job market.

As the Economics department expands in admissions and influence, our faculty members and staff continue to work diligently. This issue is both our tribute to them and a testimony of their hard work. The research done and interviews conducted in this issue reflect not only students' academic proficiency but prove them to be aware thinkers. We cover a range of politically-salient topics and globally-relevant issues from the value of higher education to the question of diversity to the economies of emerging countries.

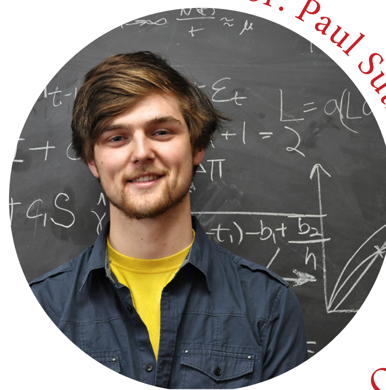
Finally, we applaud the students who have worked on this year's journal. Every word and every page were researched, written, designed, and edited by motivated students. We also received invaluable support from faculty members and kind inquires from our vast alumni network. It is only with their continual advice and financial assistance can we make the journal possible.

Thank you for reading. We hope you enjoy Equilibrium 2015 as much as we did producing it.

Amy Wang and Neha Alluri
EQ's Editors-in-Chief

writer: Razan Dagher

editor: Paul Sutherland



writer: Brody Kothe

writer: Amrit Hundal

writer: Anthony Oates

Staff

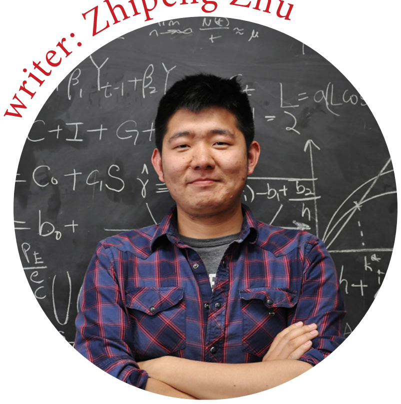
writer&artist: Madeleine Jones

writer: Elissa Kosadi

& CONTRIBUTORS

Michael Orlowski- editor
Neil Patel- editor
Connor Thellman- writer
Christina Sze- layout design
Rishika Narala - cover art

writer: Zhipeng Zhu



The EQ Staff
William H. Sewell Social Sciences
Room 7238
1180 Observatory Drive
Madison, WI 53706-1393

EQUILIBRIUM
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Parental Altruism & Patience in Childhood Investment Decisions.

According to the Department of Agriculture, on average, it costs $245,000 dollars to raise a child to the age of 18 in the U.S.

Research by Jinghao Yang
Written by Zhipeng Zhu

Have you ever wondered, as a college student, how much money your parents have spent on you throughout your lifetime? Statistically speaking, raising a child is getting more and more costly. According to the Department of Agriculture, on average, it costs $245,000 dollars to raise a child to the age of 18 in the U.S. This is partly the reason why countries like Ukraine, the U.K. and France have experienced major decreases in birth rates. And as a consequence, many countries in the world, such as Germany and Denmark, are experiencing shrinking population growth. These negative population growths can decrease a nation's labor supply, productivity, and weaken its national defense and security.

Investment in education is a big major decision and takes a long time to reap returns. Investment in children during their development is long, difficult, and time consuming, but the rewards are invaluable. What is the best way for parent's to maximize their return, in terms of academic success, through investment in their children? It is a tough question and it usually takes a whole lifetime to solve. In his research, Jinghao Yang tried to address the question by investigating which parameters in early childhood can affect the outcome of cognitive and non-cognitive abilities of children, and how they change children's development. Through his research, Yang tries to provide a new understanding of parents' optimal investment in their children. .

Parents' altruism level, parents' patience level, family income, children's interest and talents - just to name a few - are some factors that can affect lives of the children. Yang studied how children of parents with different altruism and patience levels responded to monetary investment in their education during their upbringing. He measured altruism by the amount of money spent on children and patience in hours spent with children, and characterized success by children's performance on standardized tests.

Yang built the two-period models to measure these effects on two different investment periods, early childhood development from 2-6 and late childhood development from 7-11. He uses the Letter-word Identification (LWI) test score to measure the cognitive ability of children. The Letter-word Identification test is a method that decodes the recognized letter and words. When reading and decoding, letters and words are accessed from the mental lexicon (the store of word knowledge) and then phonologically recoded. For noncognitive ability, Yang chose the Behavior Problem Index (BPI). The BPI test is a measure of the frequency, range, and type of childhood behavior problems for children aged four and over. Yang keeps count of two groups of children that are aged 2-7 and 7-11, and then divides them into two waves, analyzed in simultaneous equations. In his regression, the independent variables contain the altruism level and patience level, and dependent variables contain the standardized test scores.

According to his inter-temporal trade off model, Yang found that as parents become more altruistic toward their children, the ratio of optimal investment in two periods will fall. That is, the parents' investment decisions are delayed to the second period. Yang in his research characterizes this as a decrease in the marginal pivoting effect and decreasing rate in the increase of the standard test scores, assuming different investment levels. As the parent's patience increases, the ratio of their optimal investment level decreases, and their investment is relied more heavily on the second period of the childhood. In the end, the paper points out that investment in age 2-6 and age 7-11 are gross substitutes, however, the different age groups are not one-to-one substitutes.His findings suggest that investing in a child's life yields higher returns when its earlier in life than later

The paper points out that investment in age 2-6 and age 7-11 are gross substitutes; the different age groups are not one-to-one substitutes. Lacking in investment at age 2-6 requires additional compensation in age 7-11 to achieve the same cognitive and non-cognitive performance level.

He also found that credit constraints, including loans and aid to low income families, could play a big role in parents' investment strategies. Yang advocates for policy implications where credit constraints play a more important role in the early childhood period because it more important than the later period. Higher accessibility of loans or easing constraints on credit could be good policy choices.

Yang's policy suggestions are also supported by psychologists. Educational psychologists have found through scientific research that disadvantaged children from low-income families can benefit the most from early childhood education. However, lending to disadvantaged families is risky and expensive, so often government intervention is required. According to the report of Organization of Economic Cooperation and Development countries, the share of government spending on children is different among countries. Czech Republic, Iceland and Hungary are on top of the chart, while the United States is seconf to last among industrialized countries.

The current situation is clearly understood by the Obama administration, which has worked to reduce the severity of the issue through both advocacy and policy. In the 2013 State of the Union address, Obama claimed "to make high-quality preschool education available for every child in America." Obama stated in a town hall meeting at Decatur, Georgia that "study after study shows that the earlier a child begins learning, the better he or she does down the road." James Heckman, whom Yang cited extensively, is a famous social economist who wrote extensively on social mobility and human capital development. Dr. Heckman's research outlined that disadvantaged children receive extremely high returns in the long run for early an early educational investment compared to their peers. It pays dividends not just in their cognitive abilities but also social skills, motivations in life and self-esteem.

To understand how patience and autism are related investment strategies, it is important to look at the numerical results of the regression and understand their actual economic interpretations. Studies have used the LWI score measurement to find that an investment during the 7-11 period yielded a return of 0.0262. This means that a 1% increase in investment for a child would increase the child's LWI score by 0.0262. Children aged 2-6 boast a much higher rate of return (0.0514), almost doubling the investment return on the 7-11 year-olds. Contrarily, BPI scores are presented differently. It is shown that for BPI score - investment in age 7-11 has a rate of return of 0.0808, greater than 0.0467 in ages 2-6. The differences among investment effects between age groups is significant.

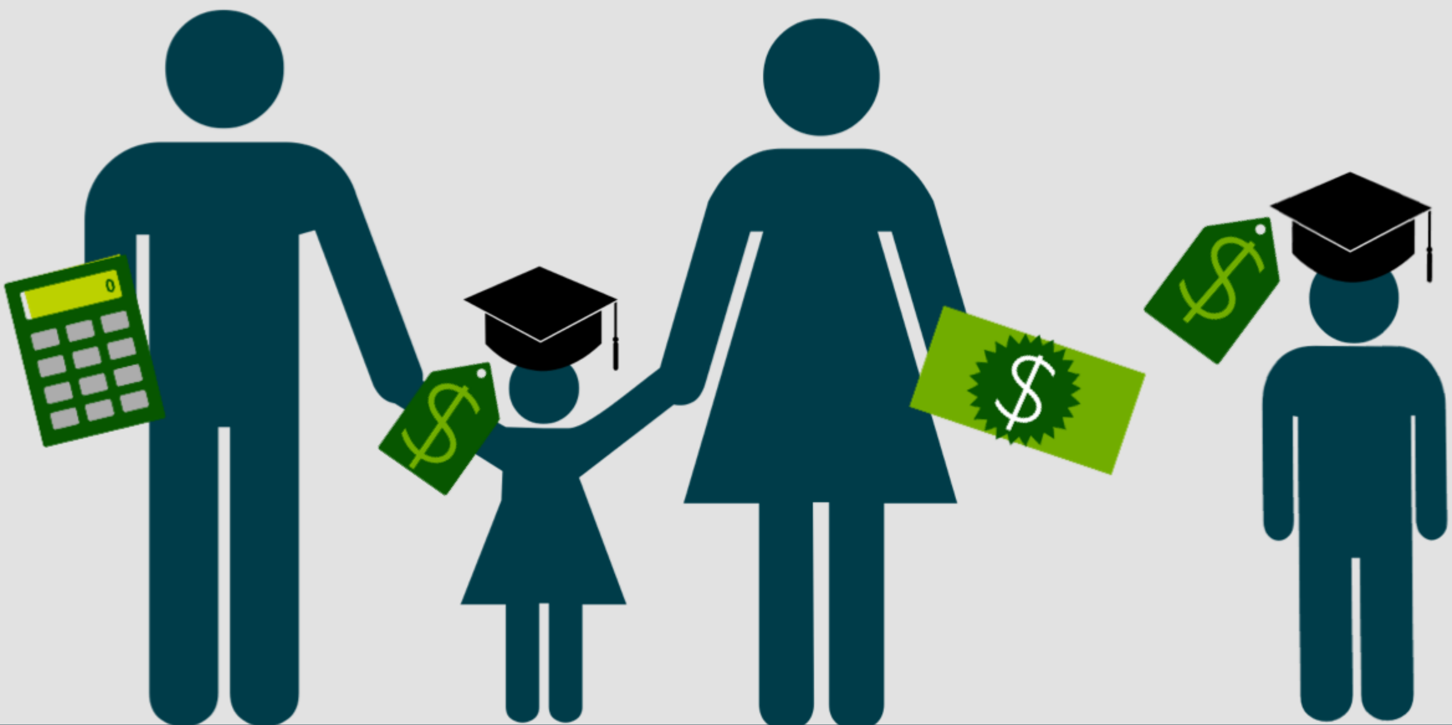
The results explain and verify that a lack of investment during the age 2-6 needs to be overcompensated for during the age 7-11 in order to achieve the same cognitive and non cognitive performance level. The investment, for disadvantaged families, means spending money for the children and adding financial burden to the family. This research, along with the work of psychologists and other social scientists, leads to an important policy implication,increasing the accessibility of funds for disadvantaged families by reducing barriers is a paramount step to ensure that no child is left behind.

Work has already been done in response to the recommendation to reduce borrowing constraints on low-income families with young children. After Obama's public speech at Decatur Georgia, the president proposed a plan that helped increase enrollment in free preschool programs. According to a report in The New York Times, the United States is moving forward with accelerating policies to improve the preschool system. Alabama's Governor Robert Bentley has been aggressively developing the taxpayer-financed pre-school system and increasing available slots for children. Even though it is too early to see any tangible effects of the preschool system on disadvantaged families, it is encouraging that it is rapidly changing..

Alabama is one of the five states that received top marks for its preschool system according to the National Institute for Early Education Research. The development of the free pre-school system supports disadvantaged families by offering an early investment in children. for offering investment in the early childhood period by relieving their financial burdens. Alabama is a good example that shows how the United States is pushing for early educational investments in children by lifting the the credit constraints in education.

Yang's research results are in sync with pervious findings which show that early childhood investment has a significant impact on performance. Arguably, early investments in childhood education do result in better cognitive and non-cognitive outcomes. Lastly, the paper suggests that alleviating financial burdens on disadvantaged families is the key for increasing social mobility. In order for America to remain "the land of opportunity" where poor people can move up the income ladder through hard work, a taxpayer-financed preschool system needs to be developed.

Parents not only have to invest money at the right time but also master the best investment strategies based on their intrinsic patience and altruism. Would this challenge push couples not to have children? Only time will tell. **eq**



A High School Graduate's Dilemma

The Effects of Attending Community College Versus Earning a Bachelor's Degree.

Research by Nathan Mislang
Written by Razan Al Dagher

During Obama's State of the Union speech in 2015, he mentions a plausible reform in the education system that would involve offering two years of community college for free. However, this decision is conditional; students are expected to maintain a GPA of 2.5 or higher and work towards eventually transferring into a four-year institution. One of the key aspects of Obama's speech was how important it is to obtain a higher education. Today, every two out of three jobs require completion of a four-year degree.

There are two opposing opinions to the President's statement. Andrew Kelly, director of the Center on Higher Education Reform at the American Enterprise Institute, regards it a federal reform agenda disguised as a free institution and others view it as a major element leading to a boost in economic growth. Regardless of these opinions, it is worth noting that education is a key factor to improve the United States' economic growth.

While President Obama is pushing for free education, in Wisconsin, there are obstacles such as Governor Scott Walker's budget cuts that have made obtaining a degree tougher. These two policies are conflicting as the President is trying to make tuition free, but the policy in Madison may discourage students from pursuing a higher education; a program at a four-year institution. Governor Walker's budget cut of $300 million on the UW system over the next two years can have a major impact on the quality of education the UW system offers. Besides lowering the quality of education, it will also raise tuition costs for students. In order for universities to offset state funding, tuition costs will rise.

As high school seniors graduate, they struggle to decide between attending a four-year university or a local community college. The reason why graduates have trouble making a decision is because there are pros and cons to both decisions. For example, even though attending a four-year institution gives one an edge when applying to jobs, it also accumulates debt. And while community colleges might be cheaper, some students find it more difficult to transition to four-year institutions. Transferring from a community college to a four-year institution can be a hurdle for many reasons. Some of the reasons include, but are not limited to, problems with credit transfers, difficulty forming new relationships, or simply adapting to a bigger campus with more students.

There are many reasons why community college is a more appealing choice to students. Community colleges cost half as much (per credit) as four-year institutions and are usually a good alternative for students who perform poorly in high school. They are also a great choice for people who decide to go back to school after taking time off, for veterans, and those who are rejected from four-year institutions. Although community colleges have benefits, there are certain barriers that prohibit a student from transferring to a four-year institution. Credit transfers are one of the biggest problems that make the transfer difficult.

On the other hand, there are pros and cons to attending a four-year university. One of the benefits of a four-year university is that it is academic. The farther a person is into obtaining their degree, their academic opportunities become broader. Four-year institutions have excellent libraries, opportunities for research, language and writing centers that aid a student in their academic path. They also allow students to design a curriculum that fits their career interests. However, they also have cons. As mentioned earlier, universities providing a four-year degree are twice as expensive. In addition, the number of students per class in a four-year institute may prevent students from engaging in thoughtful and intriguing discussions with their professors. These factors make the decision of choosing between community college and a four-year institute a daunting one.

Mislang concludes that attending a two-year school had a negative impact on receiving a four-year degree. Whether a student decides to enter two-year or four-year college also largely depends on the student's financial constraints, risk-aversion and passion for a higher education, not race or gender.

There has been consensus stating that attending community college decreases the chances of earning a four-year degree. UW-Madison's alumnus, Nathan Mislang, studies this using a probit regression model. In his paper, Mislang focuses on traditionally aged (17-19 year old freshmen) students and their education goals, and estimates the effect community college attendance has on their probability of earning a bachelor's degree. These variables were neglected in previous studies leading to possible bias in the results. He uses data from the Education Longitudinal Study (ELS), conducted by the National Center of Education Statistics (NCES), of around 20,000 sophomore high school students since 2002.

Mislang found in Long and Kurlaender's research (2009), that women have greater difficulty getting accepted into a four-year institution after attending community college compared to men. He also states that the location of a college has always been a crucial variable when conducting studies on the effects of community college on receiving four-year degrees. While Mislang avoided the proximity problem, other researchers (Alfonso 2006, Long and Kurlaender 2009, Reynolds 2011) have used it in models to churn out more accurate results.

The methods used in previous literature include propensity score matching (PSM) and probit model instrument variable (IV)* of college proximity. PSM is a statistical method used in analysis to estimate the effect of a policy taking into account the covariates that portend the policy, and an IV is usually used to approximate a causal relation when controlled studies are not possible. Researchers have found that the probit model with the instrument variable is better than propensity matching. This preference is due to the instrument variables that control the selection bias that generates more accurate results.

Mislang limited his data to students who began college by the end of 2005, generating a sample that exemplifies traditional age college students. Through his data, he finds that around 27 percent of students of the observed 20,000 began at a two-year community college. This number includes a large portion of students in the higher education pool.

In the process of refining his data, Mislang drops around 1 percent of observations that seem to be irrelevant to his study. He drops students that do not attend college, attend a college for less than two-years, students that aspire to attend one for less than a four-year degree (to avoid bias), students who refuse to release their transcripts and those who didn't participate in the base year or in the third follow-up. After dropping these observations, Mislang noticed significant changes in statistics.

With an access to household income, socioeconomic status and parent's education, he was able to conclude that race and gender (with the exception of the Asian race) were insignificant factors contributing to the probability of earning a bachelor's degree. However, Mislang discusses some difficulties with his research. One of the difficulties was the school's proximity to a student's home. Homesickness, comfort, or simply not being ready to leave the parents' home are all reasons that prevent a student from attending a school which is remotely far. Mislang uses a dummy variable to represent the proximity of colleges to a student's home (it would equal one if the student wants to live far from home and zero otherwise).

Similar to other research where college proximity was used as an instrument variable (IV), Mislang's results were very similar considering that he did not have the material to use the same IV. He found that an increase of one point in the math score of an average student is related to a .003 increase probability of receiving a bachelor's degree. Other than math, a GPA also has great statistical significance. An increase of one point in GPA is linked to a .204 increase in getting a four-year degree. Finally, he concluded that attending a two-year school had a negative impact on receiving a four-year degree. Community colleges, according to Mislang, lead to a 0.185 decrease in probability of receiving a four-year degree. His findings confirm previous studies and state that there is a negative relationship between attending community college and the probability of receiving a four-year degree.

Moreover, Mislang ran a similar probit model to test the effects of attending a public versus a private school. His results show that there is a 0.127 decrease in the probability of receiving a bachelor's degree if the student has attended a public school. However, Mislang argues that these results should not be taken lightly; though private institutions promise quality of education and respect degrees, other private schools use profits as a catalyst to encourage students through their educational path.

In his thesis, Mislang clearly examines the key factors that could have been an influence on the completion of an educational career at a four-year school. Contrary to previous findings, he was surprised to find that gender is not among those factors. He wraps up by stating that in order to provide a good answer to whether a high school student should start at a two-year school or not, relies on a larger data set with the negative impacts of attending community college as a parameter. Thus, a student's decision largely depends on the student's financial constraints, risk-aversion and passion for a higher education.

Mislang in the beginning of his paper says, "The sheepskin effect describes the increased labor market value of a degree holder over someone of the same education, but no degree". Meaning, the integrity and legibility of a person's knowledge is restricted to whether that person has a degree or not.

Thus, having a .185 decrease in probability in receiving a four-year degree greatly shapes the future of students' role in an economy as well as the economic growth of the nation.

It is clear that Mislang's research points towards the importance of obtaining a degree in higher education and the struggle students face during this pursuit. This is a call for policy makers to aspire to be like countries like Germany. Mislang's research could act as a cornerstone for policy makers to work towards building a pillar for the youth of the United States. **eq**

As the first female president of the WTCS, Morna is in charge of an organization consisting of 16 public community colleges, providing training to over 340,000 students system-wide in preparation for employment in trained labor.

A Chat with The Wisconsin Technical College System.

Morna Foy is an alumna from the University of Wisconsin and is currently serving as the President of the Wisconsin Technical College System. After receiving her undergraduate degrees in Economics and Political Science from UW-Madison, she received her Master of Public Administration degree in Finance and Public Policy from the University of Indiana. After serving eight years as the Vice President of the Wisconsin Technical College System (WTCS) and concurrently pursuing a doctorate in Education Leadership and Policy in UW-Madison, she assumed her current role as the President of WTC in 2013...

Alumni in Review: Morna Foy

Written by Brody Kothe

EQ: What drove you to study Economics and Political Science as an undergraduate at UW-Madison?

Foy: Coming in I was interested in politics, and was encouraged by my older brother who was already here to sign up for any major in order to fit in to a small group on a large campus. I declared as a political science major and, as a sophomore, ended up taking Introduction to International Relations with a tenure faculty member. At the beginning of the semester, she stood up at the front of the class and told us that it is not possible to understand international relations without understanding economics. She was very convincing, and I started taking economics classes.

I think it's a very good foundational degree. I took an economics class at UW with a professor whose research focus was the underground economy. It was fascinating to me because he made economics seem much more relevant to my daily life. He showed me how economics is about human behavior; about how things we need and want affect how we behave. When you get down to it, it's really a fascinating field.

WISCONSIN TECHNICAL COLLEGE SYSTEM

EQ: What aspects of an Economics education have helped you in your work as the president of the WTCS?

Foy: First off it really helped my math skills, which have been important throughout my career. Being able to think about problems and solutions in a mathematical way really helps crystalize situations, and in general, how to deliberately go about processing information. It also introduced me to taxes and how government influences or incentivizes certain behaviors in society. Tax policy is a very important thing to understand if you want to work in any level of government. It affects how programs are set up and why they're funded or defunded. In the case of the Technical College System, we rely quite heavily on local property taxes to fund our colleges. I think my economics courses really were important to my understanding of how they work.

It also helped me to appreciate the grey in life, especially in my field of education and public service. It is not black and white; there is not one way to do it. In the private sector, you have the profit motive as the North Star and driving factor. You can't really do that in the public sector. You have to take into consideration who will be helped, who won't be helped, and who will be hurt by our decisions. This makes a lot of things grey, and you have to be able to sort through the grey otherwise you will be blinded by the fog and unable to go anywhere. I think economics gives you the analytical tools to compare those things and make decisions that will be the best possible outcome with the least negative consequences.

A Conversation with Alumni MORNA FOY...

EQ: Talking about the grey, in the 2013-2015 WI state budget, the WTCS proposed a plan to incorporate performance-based funding into their state aid. Currently up to 10% of WTCS's state funding is performance based. These numbers are set to increase to 20% and 30% over the next two years, but Governor Scott Walker has proposed to increase the amount of performance-based state aid to the system to 100% over the next few years. What has to be done to make these policies effective?

Foy: As a pilot we wanted to try this out. The majority of states are currently experimenting with this, and many states have been doing this for years. Tennessee is currently in year 32 of performance funding, and they just recently went to 100% for their system. But that's after 32 years of trial and error. We proposed the funding initially, and the governor took it up in a slightly different form and wanted to make it an incrementally greater share of our state's general aid. The legislature disagreed with that the last time around and decided to cap it at 30%. We have built a model that all of the system colleges have agreed to that involved not just themselves, but their customers, stakeholders, businesses, students, and the legislature. We have seen positive change already with about 10%. People ask, "How much money has to be put in?" or "What's the right percentage to make any difference?" It's really situational and depends on the state. We expect to see positive change at 20% and 30%.

What we've seen though, is that after 30%, larger schools will start losing significant amounts of money as a result of the shift away from the old statutory formula based on school enrollment, tax levying ability, and overall area expensiveness. While smaller schools will be able to increase their state revenue, this will create problems for us collectively. At a certain point, the big schools will be losing, because it will no longer be a reflection of their performance.

EQ: Do you feel this drastic shift will lead to inefficiencies in the system?

Foy: The shift to 100% will create divisions amongst the colleges and will affect their enthusiasm for outcomes based funding as appropriate. It will also diminish the equity component of state funding that all citizens get the same access to quality education. Performance-based funding cannot accommodate that kind of equalization concept. I believe that having a combination mechanism of statutory and performance-based is the best and most appropriate way.

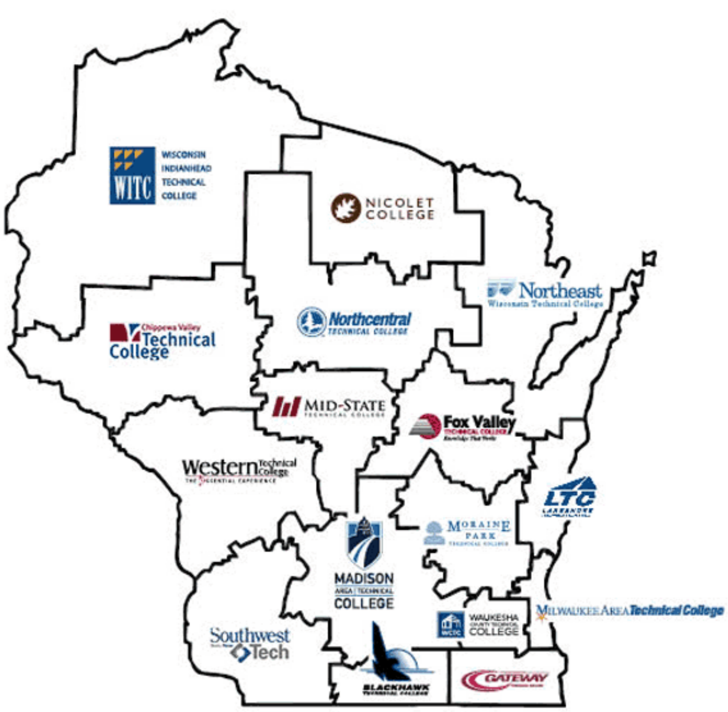
EQ: How do you adjust your trades programs when faced with changing U.S. workforce and sector dynamics?

Foy: We have a very elaborate and robust method of designing our programs. We add and drop programs every year across all the colleges. We have advisory committees made-up of employers for every degree program at every college. We have over 300 advisory committees that meet and talk with faculty about what we teach, our competencies, the general education requirements, andwhat kind of equipment students are expected to use. We also look at a lot of labor market information and trends on labor and job openings. We place a heavy emphasis on the employment of our graduates. We want to be sure that our students are ready.

EQ:In January President Obama proposed a plan for the U.S. government to provide free two-year community college to all U.S. high school graduates maintaining at least a 2.5 cumulative GPA and 50% attendance rate. How do you see this affecting the Wisconsin Technical College System in the future if enacted?

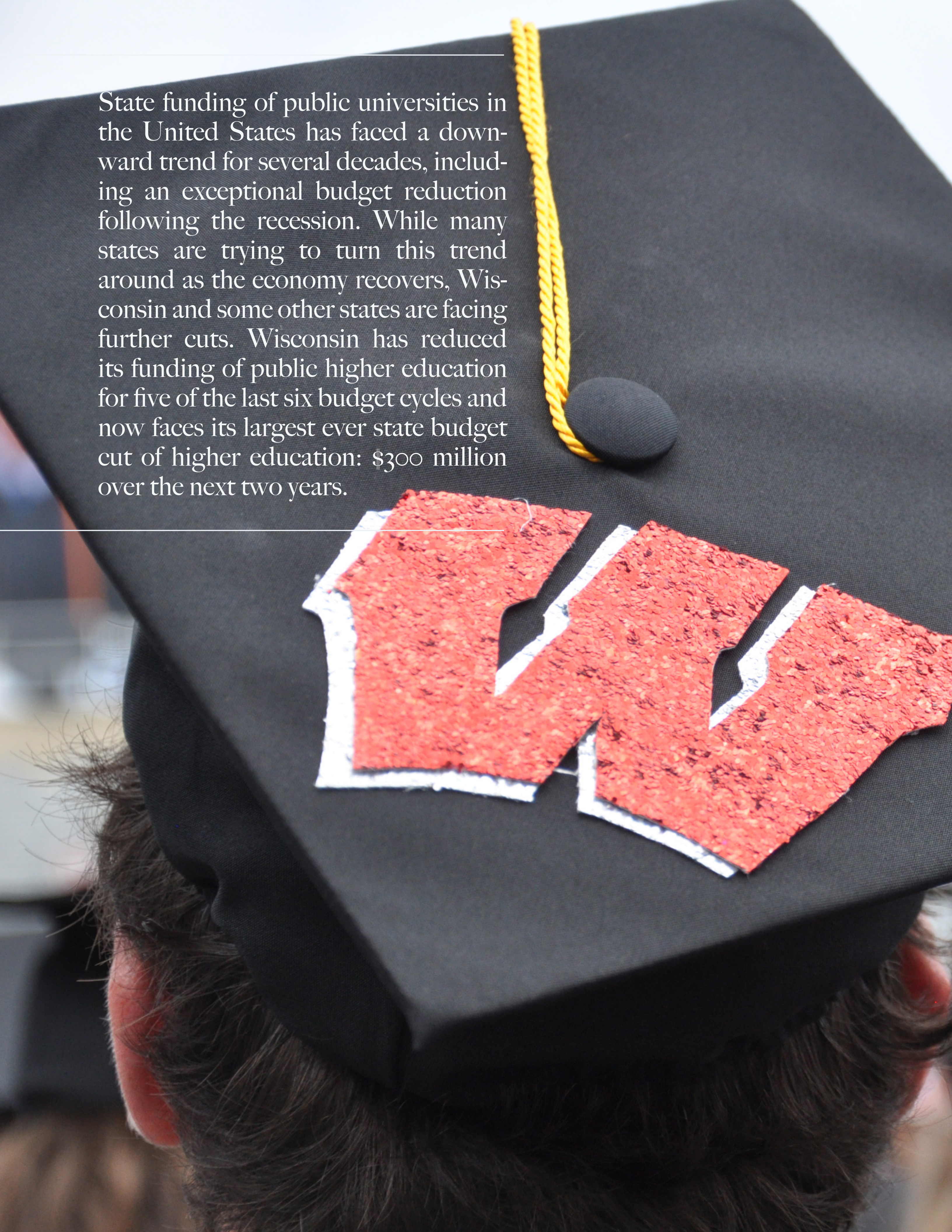
Foy: Given the work and history of our system, hearing that two-year technical colleges as the subject of a national discussion about how they can grow the economy and improve the lives of our citizens is so great! Recognizing the value of our programs as what makes the U.S. economy globally competitive is highly rewarding for everyone who works and goes to a two-year college.

The recognition and value of our programs as a difference to make the U.S. globally competitive is a great feeling for everyone who works and goes to a two-year college. Our programs have historically suffered as people associate us as a stopping place for four-year institutions or who could not make it to one. It's a very common misconception about two-year colleges. From that perspective, to be the subject of this conversation has been terrific.



However, under the President's proposal, states would have to cover a large portion of the cost. In our state, the costs associated are many millions of dollars that we don't have in the state budget. There is a realistic concern that states might pull that money out of already existing support that's being provided to two-year colleges. The money that would come from tuition would be cut out from the technical college system and would essentially result in a forced budget cut while having to serve more students. That gets really tricky when average class sizes in the system is 10 students. That will take away the beauty and opportunityof the hands-on education programs ours can offer. The president's idea was that institutions wouldn't have their budgets reduced to make this happen, but in a practical sense, that probably won't be the case. A lot of details have to be worked out.

Another issue is skin in the game. If you have the resources to go to college, studies have shown that a financial investment of your own will lead to people taking their education more seriously thus working harder. Students will have to honestly ask themselves, "Will I work harder if I don't have to pay for it?" Another issue is that this proposal only covers tuition. Tuition is only one part of your educational cost. You need to a place to live, have food to eat, and buy books amongst other things. A lot of folks don't have these other financial resources to attend college. There will still be a lot of work that needs to be done to get them involved. I think it's great to talk about these options, but the devil is in the details. We have to work those out to decide whether this proposal would improve access and completion of two-year degrees for Wisconsinites. **eq**



State funding of public universities in the United States has faced a downward trend for several decades, including an exceptional budget reduction following the recession. While many states are trying to turn this trend around as the economy recovers, Wisconsin and some other states are facing further cuts. Wisconsin has reduced its funding of public higher education for five of the last six budget cycles and now faces its largest ever state budget cut of higher education: $300 million over the next two years.

University Budget Cuts: A View From Both Sides

Written by Connor Thellman

By the Numbers

There have been varying percentages used to describe the university system budget cut ranging all the way from 2.5% to 25%.It can be hard to know where these numbers actually come from, so here are the basic calculations. The $300 million cut is over a biennial budget cycle, which is $150 million per year. This yearly reduction out of the state's yearly contribution of $1.2 billion is 12.5%, which rounds to 13%. This yearly reduction out of the total yearly budget of $6.1 billion is 2.5%. Incorrectly using $300 million as an annual figure will give a reduction of 25%.These different percentages and many in-between were used in the early stages of debate: Governor Walker's Facebook page cited a 2.5% reduction, which is not necessarily incorrect, and a liberal radio talk show cited the 25%, which is. As the discussions evolved, a 13% state reduction of higher education funding became the established relevant figure.

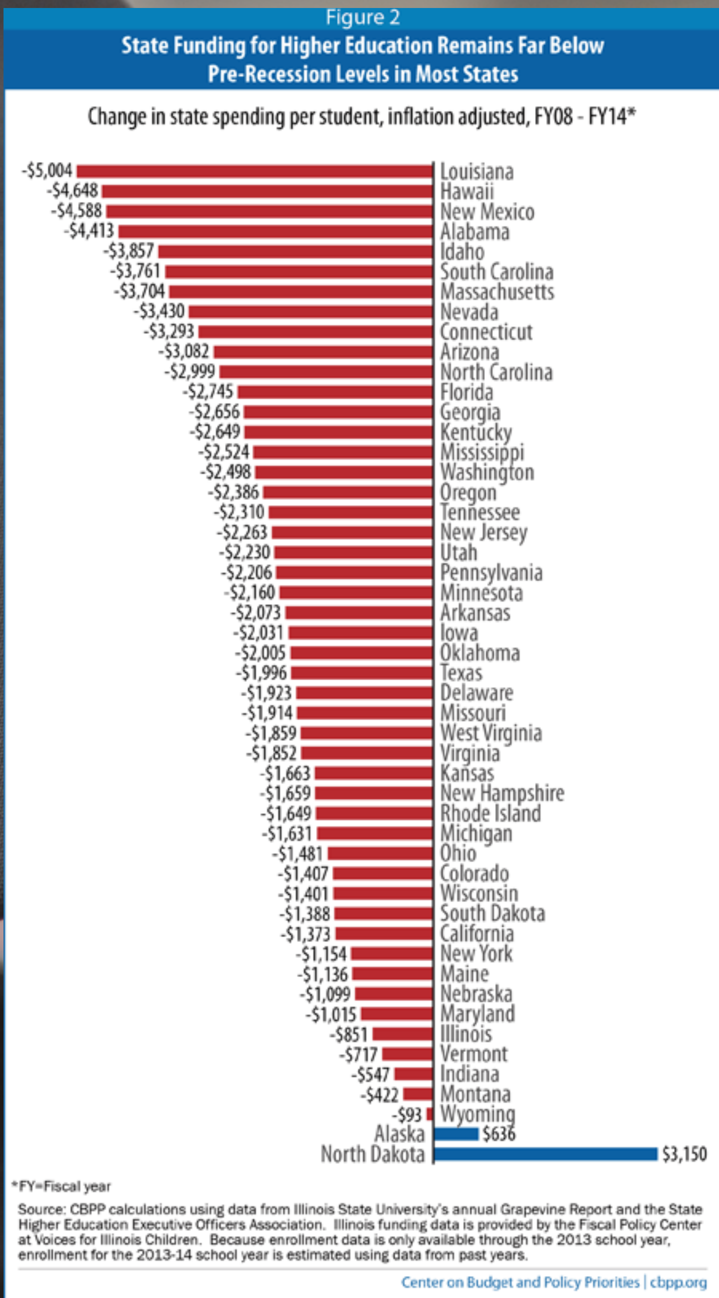
Although the university system has an annual budget of $6.1 billion, $3.7 billion has predetermined allocations. Grants from public agencies, foundations, and large private donors are usually given for specific aspects of a university or university system, and are nontransferable. So when discussing the university system's workable budget, the accurate amount is $2.4 billion. With respect to this amount, the reduction has a yearly impact of 6.25%. A study by the Center of Budget and Policy Priorities considers these cuts sizeable.

What impact might this cut have on UW-Madison?

UW-Madison makes up the greatest portion of the university system's funding at about 40%. This proportion translates to a loss of $57 million from the cutswith additional, indirect cuts. Chancellor Rebecca Blank says that in total there is a "91 million dollar hole to fill."

The cuts mostly affect the educational side of the university. At a university-wide undergraduate forum, Chancellor Blank said that to lessen this effect, she would spread the cuts to both education and administration. After her adjustments, Chancellor Blank will give the deans their new budgets, and it will ultimately be their decision on how to adjust departmental funding. Moreover, there will have to be newly created faculty positions that go unfilled. There have already been what the chancellor has called "casualties" in the hiring process, where candidates for a position have withdrawn from the hiring process because of the political climate. A few aspects of the budget will remain largely unchanged. The chancellor has made clear that she will not make any large cuts to diversity initiatives and will also keep the university's promise on all financial aid. The university's reciprocity with Minnesota will also remain largely unchanged, except for some minor adjustments within the system to give the University of Wisconsin-Madison a larger portion of its reciprocity tuitions to raise revenue.

When faced with cuts, the chancellor must raise revenues as a counter balance. Chancellor Blank will raise some professional school tuitions and out-of-state tuitions, which are considered to be some of the best valued in the Big Ten Conference. She believes that the university's undergraduate out-of-state tuition rate of $26,660 should be at least that of the Big Ten's median out-of-state tuition rate of $31,847. Furthermore, she wants to raise the out-of-state student cap to add to the number of out-of-state students paying tuition. Another revenuere source is the university's reserves. The system itself has $1 billion in reserves. Kevin Riley, the University of Wisconsin System President, said in discussions surrounding the number in 2011 that reserves this size are typical for a state university system. Yet, the "slush fund cuts" went into effect in 2011, and the University of Wisconsin-Madison has spent down its reserves from 420 million dollars to 387 million dollars. Again, some context: most of these reserves have strings attached to them, so the budget balancing has come from discretionary reserves, which have $54 million and are shrinking.



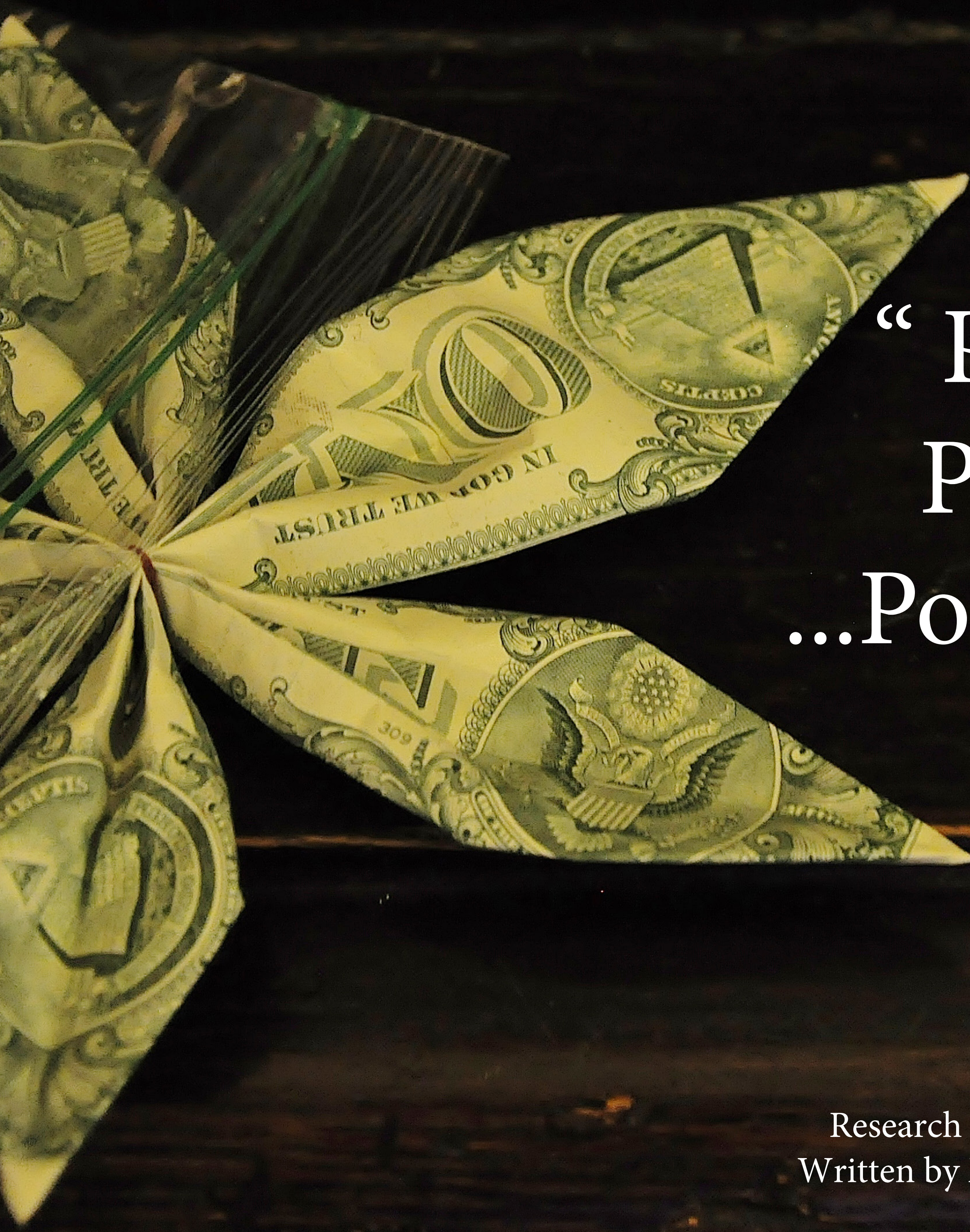
Above: Mitchell, M., V.Palacios, M Leachman."States Are Still Funding Higher Education Below Pre-Recession Levels" Center on Budget and Policy Priorities. May 1 2014. Web. http://www.cbpp.org/

The National Context

Nationally, higher educational funding is controversial. The few states facing higher education cuts in their next budgets are Arizona, Illinois, Kansas, Louisiana, and North Carolina. All of these states have other much-debated budget cuts proposed by their governors. On average, states are raising their higher education funding, but not yet to pre-recession levels,excepting two states, Alaska and North Dakota, which are experiencing economic booms.

Looking forward, it is difficult to establish any concrete conclusions as to what will happen with higher education funding. As part of his "middle class economics" proposal, President Obama said he wants to expand policies that will make college more affordable, and even give free tuition to some community college students. Whether or not this will happen anytime soon is uncertain, but education as a workforce training initiative is becoming well established in the United States, with many cities, including Madison, strengthening their technical college's relationship with local businesses. The president also said he was informing universities not to raise tuition every year. Yet, for the universities experiencing cuts and needing to raise revenues, it is hard to know what the right move is. Ultimately, a state's funding of its university systems is up to its elected officials, and their decisions surrounding spending are incredibly difficult to predict. eq

How economic modeling can be used to inform policy by demystifying the connection between tobacco, alcohol and medical marijuana.



" Puff, Puff ...Policy? "

Research by Eric Koepcke
Written by Madeleine Jones

"We have to take our time and hurry up." Senator Daylin Leach's paradoxical statement underscored a key theme at the Senate State Government committee hearing that convened this February to discuss a proposal to bring medical marijuana to Pennsylvania. "There is an inherent tension between wanting to get a perfect bill and the medical exigency of so many people in Pennsylvania who will benefit from medical cannabis," Leach stressed. Despite his calls for expediency, a vote on the legislation that would add Pennsylvania to the growing list of states that allow medical marijuana is months away, as the bill has elicited heated debates on both sides of the issue.

Sally Schaeffer of Burlington, Wisconsin emphasized a similar sense of urgency in her push last year for legislation that would legalize a drug that includes a small amount of THC. Schaffer's seven year old daughter, Lydia, suffered from a rare form of epilepsy, and after hearing that children with similar conditions responded favorably to the drug in Colorado, she worked tirelessly to petition for its legalization in Wisconsin. "When I testified in Madison, I said please don't take my sunshine away," Schaffer recalls. Legislators increasingly find themselves in the position of attempting to balance lingering questions about medical marijuana and the sense of urgency felt by families like the Schaeffers. The healthcare community and general public are divided on the issue of medical marijuana, and marijuana laws vary considerably from state to state, which reflects the nations' lack of consensus regarding the issue. Twenty-three states and the District of Columbia have legalized medical marijuana use, but currently it is still illegal in Wisconsin. Many policy makers, healthcare providers, and citizens feel that there are critical issues that need to be researched and addressed before they can support medical marijuana legalization.

Interestingly, economic models can be used to examine many of these important questions that policymakers face when considering medical marijuana legalization. Specifically, by examining the effect of adoption of medical marijuana laws on demand for recreational marijuana, researchers can explore how recreational marijuana use might be influenced. Furthermore, the concept of cross-price elasticity can be used to examine how alcohol and tobacco use rates are related to marijuana use. Even marijuana's habitually addictive aspect can be examined using economic techniques, specifically the Becker Murphy model.

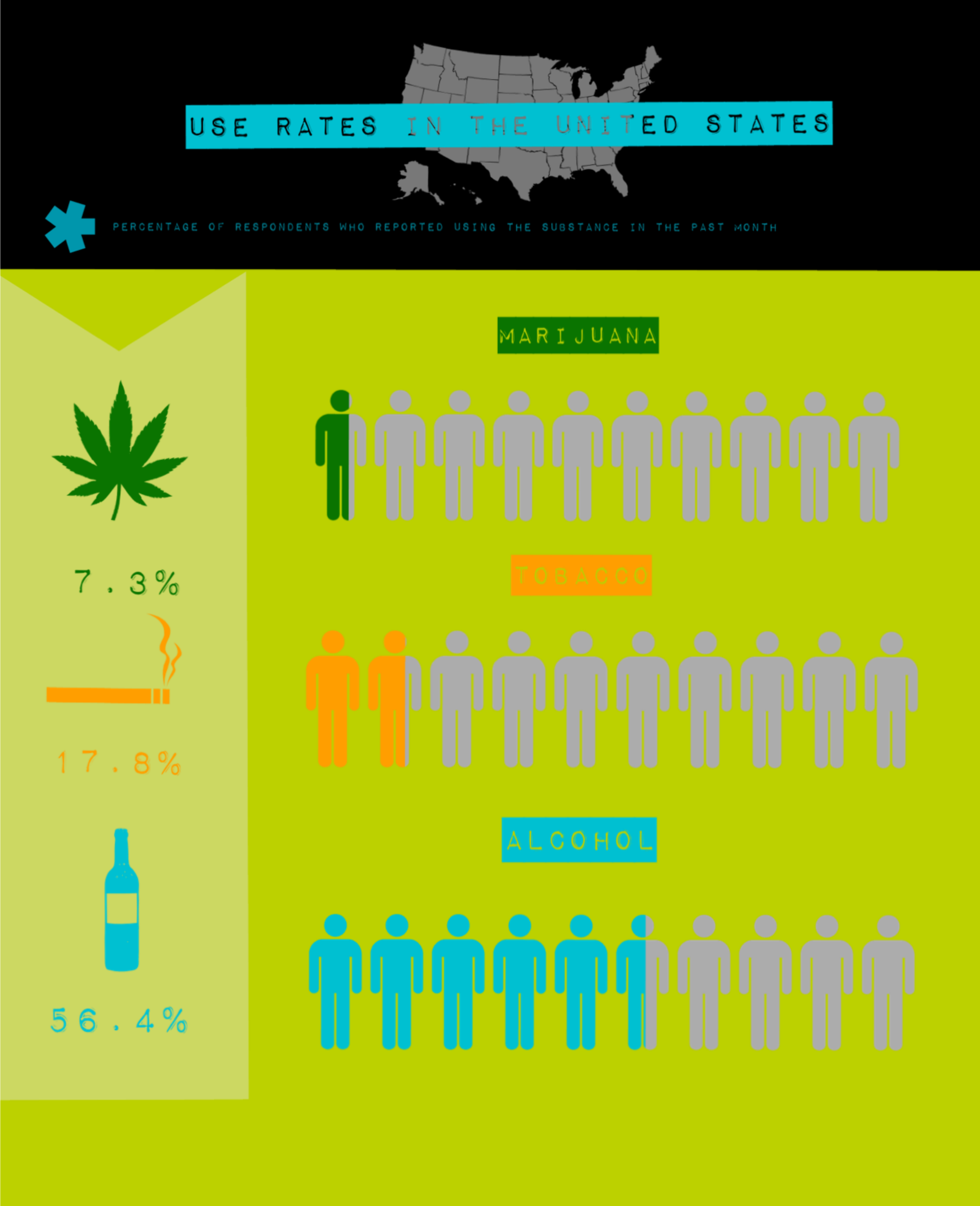
Eric Koepcke, an economics major who graduated from UW- Madison in 2015, set out to examine many of the assumptions surrounding marijuana use by creating economic models and using them to examine existing survey data. Koepcke documented his findings in a scientific journal article, "The Effects of Tobacco, Alcohol, Medical Marijuana, and other Correlates on Marijuana Use", which was published in December of 2014.

The main focus of his study was to investigate whether states that adopt medical marijuana laws experience an increase in recreational use of the drug. It is tempting to conclude intuitively that legalizing medical marijuana might also increase recreational use, but how well do these types of deductions align with statistical data? This is a key area of debate in courtrooms like the one in Pennsylvania where medical marijuana policies are decided.

Koepcke did not find substantial evidence to conclude that medical marijuana laws impact the frequency of recreational use in the states that have adopted them, discrediting the common argument that medical marijuana laws will lead to increased marijuana use by the state's population.

In order to provide a more complete picture of the factors that affect marijuana use, Koepcke also examines how recreational marijuana use is affected by demand for alcohol and tobacco, police enforcement, and characteristics of individuals. He formulated a method that would allow him to quantify the strength of the relationship between these factors and marijuana use, which may help to increase the efficiency and effect of policy measures. For instance, if a factor is shown to have a very weak relationship with marijuana use, the legislators can avoid wasting time and money trying to regulate this factor in their bills. Statistically based findings such as Koepcke's allow legislators to increase both the effectiveness and speed of marijuana legislation. In essence, it could help make Senator Leach's seemingly contradictory appeal to his fellow committee members a reality in courtrooms across the nation.

The first objective of Koepcke's study was to examine whether legalization of medical marijuana has been shown to increase recreational use of the drug. One of the main concerns surrounding medical marijuana laws is the potential for this externality. This type of policy issue is well suited for examination through an economic lens because it focuses on one of the social issues



infographic & art by Madeleine Jones

surrounding medical marijuana, as opposed to the biological effects of marijuana on various health conditions, which are better studied through clinical trials. In addition, the relatively recent trend of statewide medical marijuana legalization allows this question to be analyzed using data that has not been available in the past. In his study, Koepcke was able to compare the demand for marijuana in the 23 states that have medical marijuana laws versus states that do not, which would not have been possible in the recent past.

To do this, Koepcke used data from the restricted and unrestricted 1997-2011 rounds of the National Longitudinal Survey of Youth 1997 (NLSY97). This survey has been annually conducted, since 1997, by the Bureau of Labor Statistics. But at the time of Koepcke's 2014 study the most recent available results were those for 2011. The sample includes 8,984 participants who were between 12 and 16 years of age at the end of 1996. The reason that the survey focuses on this demographic is because its aim was to identify trends in the population during the transition from adolescence to adulthood. The responses in this study were collected on a basis; however, several measures were instated to attempt to improve the survey's reliability.

For his study, Koepcke developed the following model to test how marijuana use responds to past and future marijuana use, alcohol and cigarette use and prices, marijuana enforcement and medical marijuana

$$M = \beta_0 + \beta_1 M_{-1} + \beta_2 M_{+1} + \beta_3 C + \beta_4 A$$

$$\beta_5 ME + \beta_6 Medical + \beta_7 State + \beta_8 Year + \beta_9 X$$

He used M as his dependent variable for frequency of current marijuana use, and set that equal to a function he developed that also included variables for past and future use. He also included variables to represent alcohol and cigarette prices and demand, arrests due to marijuana possession, and the presence of medical marijuana laws.

The key points of interest in Koepcke's model for policy makers and politicians are the coefficients that precede each of these variables, as the sign and magnitude of these coefficients indicate the size and strength of relationships between these variables and the dependent variable, which stands for frequency of current marijuana use. Specifically, a positive coefficient in front of the medical marijuana law variable would indicate that marijuana demand increases with the adoption of legal medical marijuana, while a negative sign implies the contrary. If the estimated coefficient were very small, it would suggest that medical marijuana laws have little effect on demand for the drug in either direction. To increase the strength of his findings with regard to the effects of medical marijuana laws on marijuana demand, Koepcke controlled for differences in preferences and other characteristics that may vary by region and included a year variable to control for nationwide changes over time. What Koepcke found discredits a common intuition-based conclusion about medical marijuana legalization, and in his words is "certainly interesting from a policy viewpoint."

That may be putting it mildly. Koepcke determined that the estimated coefficient was too small to be considered statistically or economically significant, meaning that he did not find substantial evidence to conclude that medical marijuana laws impact the frequency of recreational use in the states that have adopted them. His model returned an interval from -0.009 to 0.025 using a 95% confidence level, suggesting that at worst, a state's adoption of a medical marijuana law would lead to a 2.5% increase in the probability of recreational use. Koepcke notes that, "while this is not a negligible probability, it is a worst case scenario, so the actual effect would likely be smaller," and in fact, a slight decrease in the frequency of recreational use may occur. According to Koepcke, "this clearly discredits the common argument that medical marijuana laws will lead to increased marijuana use by the state's population."

Because he included many variables in his model, it also yielded interesting results on how many other factors may affect recreational marijuana use. For example, it allowed him to predict the effect that taxes and laws regulating cigarette and alcohol use have on marijuana use. When looking at the price of alcohol, he found that a one dollar increase in state cigarette taxes are associated with a one tenth of a day reduction in marijuana use per month for a given person. So while there is evidence of a slight complementary relationship between cigarettes and marijuana, it appears that cigarette prices have very little effect on marijuana demand.

Interestingly, the estimated coefficient for frequency of alcohol use was more than double the magnitude of the coefficient for tobacco use, indicating that changes in alcohol use have more than twice the impact on marijuana use than do changes in tobacco use. Combining these two findings further supported the complementary relationship Koepcke found between the two substances and marijuana use, although overall the relationship appears relatively weak. This suggests that increased taxes on tobacco or alcohol or policies geared toward decreasing the use of these two drugs will most likely have little to no effect on marijuana use.

In the future, economic modeling and statistical analysis like Koepcke's may play a major role in deciding the fate of medical marijuana policy measures. Drug policy continues to incite intense feelings, beliefs, and debate on both sides of the issue. In forming opinions about the topic, people draw on personal experience, moral considerations, medical and biological concerns, and fears about societal implications.
Economic and statistical studies can provide citizens, and in particular policy makers, with important information about societal indicators that can inform their decisions on marijuana policy. It can reduce the chance of erroneous thinking based on intuitive conclusions, and it can clarify what effects proposed marijuana policies might have. With considerations like these, policy makers can focus their debates on less quantifiable policy aspects, such as moral implications, and avoid wasting time or creating bills based on faulty information.

Legislators know that they need to "hurry up" to help patients like Lydia but also cannot ignore the spillover effects that their laws might have on the rest of the population and more specifically, how they might impact recreational marijuana use. As more and more states consider medical marijuana proposals such as the one currently being debated in Pennsylvania, the balance between patient rights and potential societal implications is an increasingly pressing consideration. **eq**

the hidden cost of Diversity

Research by Theodore Kalambokidis
Written by Elissa Kosadies

On January 1, 1892, Annie Moore of County Cork, Ireland, became the first immigrant processed at Ellis Island. In the years that followed, the small island in Upper New York Bay became the nation's busiest immigration station, processing more than twelve million immigrants before closing in 1954. However, the history of immigration to the United States did not start when Moore first stepped onto Ellis Island, nor did it end after the station was closed. Immigration to the United States traces back to the early 1600s, when European settlers first came in search of economic opportunities and religious freedom.The majority of these early immigrants came from Western and Northern Europe, and established themselves as the racial majority.

Since those first Western and Northern European immigrants arrived in the United States, there have been periods of history marked by large numbersof individuals who share the same ethnic or racial background immigrating to the United States. Although their experiences vary drastically, immigrants to the United States throughout history share the experience of facing prejudice and suffering persecution.

Africans were the largest group of involuntary immigrants to the United States. From the early 17th century until the early 19th century, an estimated 388,000 Africans were enslaved and brought to the United States. Upon their arrival to the United States, Africans were legally stripped of their humanity and defined as property. The social reality reflected their legal status as non-humans.

In the mid-1800s to early-1900s, a flood of Eastern and Southern Europeans arrived to the United States. Their arrival initially prompted a xenophobic response from White Americans who initially perceived these groups as racially inferior. Eastern and Southern Europeans faced negatives stereotypes, exclusion from job opportunities, and even violence perpetrated against them by White Americans. However, over time these groups have been assimilated into the White racial majority in the US.

Chinese immigrants arrived at the Western United States in large numbers in the mid-1800s seeking to capitalize on the economic opportunities afforded by the California Gold Rush and the construction of the Transcontinental Railroad. Similarly to the African-American experience, Chinese immigrants faced legal discrimination in many forms. In reaction to the wave of Chinese Immigrants, the United States enacted the Chinese Exclusion Act, effectively barred all Chinese laborers from immigrating to the United States, and threatened those who did try to immigrate with prison time and deportation.

The story of immigration into the United States is still unfolding as evidenced by the most recent surge of immigrants from Central America, many of whom are entering the United States without documentation. These individuals face severe challenges in the United States. Many Americans resent Central American immigrants because they perceive immigrants as stealing jobs from deserving Americans. There is also hostility towards Central American immigrants because many only speak Spanish.

Keeping in mind the history of immigrants facing prejudice and persecution, we turn to an examination of ways in which researchers have sought to measure racism, with an extended review and analysis of a model developed by Theodore Kalambokidis, a recent UW graduate, in his senior thesis.

Researchers in a variety of disciplines have crafted tools to measure the prevalence and severity of racial discrimination and inequality. Many of the indicators that have been developed, such as the Social Dominance Orientation, Symbolic Racism Scale, and Modern Sexism Scale, are behavior oriented and rooted in psychology. Other methods of measuring inequality along racial lines combine economic indicators, such as the Gini coefficient, with population studies that reveals the degree to which inequality falls along racial lines. Theodore Kalambokidis decided to craft a model that adds to the field of study focused on measuring racial discrimination in the United States. Furthermore, Kalambokidis examines the relationship between immigrant populations and public goods spending.

Kalambokidis bases his paper on the article "Public Goods and Ethnic Divisions" written by Alesina, Baqir and Easterly (1999). Kalambokidis begins his paper by offering two contradicting hypotheses regarding the effect of ethnic diversity on public goods spending. The implications of the first hypothesis are that migrants, as part of the lower-skilled and less educated labor force, tend to immigrate to regions with higher public welfare spending, and thus the number of immigrants and the level of public goods spending should be positively related. The implications of the second hypothesis are that larger immigrant populations provoke a xenophobic reaction from the native populace, manifested in a lowering of public goods spending.

Kalambokidis' research distinguishes itself from similar work because it is specifically focused on the effect of immigrants on public goods spending rather than on the broader effect of ethnic heterogeneity on public goods spending. However, because the level of immigration and the degree of ethnic heterogeneity are related, it is useful to review the literature that examines the ties between ethnic heterogeneity and public goods spending as well. Alesina, Baqir and Easterly (1999) found that, at the city and county levels, spending on public welfare goods such as roads and other infrastructure is inversely related to ethnic heterogeneity. Numerous studies conducted around the world have found similar negative correlations between ethnic heterogeneity and public goods spending.

Much of the existing literature defines the utility an individual gains from public goods spending as the sum of the utility an individual gains through one's own use of public goods plus the utility the individual gains from others' use of public goods. Thus, one way the literature explains the negative relationship between public goods spending and ethnic heterogeneity is that the native population gains less utility when a larger proportion of individuals benefitting from public goods are of different ethnicities.

Kalambokidis' hypothesis is that the native populations' utility of social spending decreases as the immigrant population increases, and thus public goods spending should be lower in areas with high immigrant populations.

To measure this relationship, Kalambokidis designs a linear model that uses forms of social spending as the dependent variables and establishes the proportion of foreign–born in the community as the independent variables along with a range of control variables.These independent variables affect public spending in impactful ways. For example, income per capita affects spending, as larger states with more income will have larger total spending, If theories about native populations' diminishing utility from social spending as immigrant populations increase are correct, we should expect an increase in the foreign born independent variable to produce a significant negative effect on some measures of social spending.

Kalambokidis uses data from the U.S. Census Bureau and variables included in the 2011 American Community Survey and the 2011 Annual Survey of State and Local Finances. His 2005-2012 panel data is taken from the American Community Survey and the Annual Survey of State and Local Finances. Unlike other established research focused on spending at either local (city or county) or cross-country levels, Kalambokidis concentrates on measuring spending at local to state government level, allowing him to examine how the overall size of a community may affect the public goods spending outcomes.

Kalambokidis constructs his model with coefficients estimated using an ordinary least squares linear regression. In his analysis, Kalambokidis pays particular attention to two factors that have significant impacts on the result of his regression. The first factor is the measurement unit of the spending variables. He is concerned with whether he should use the percentage of total spending data or per capita data to measure the dependent variables. This proves to be a highly important distinction, as the regressions using these two different measures of spending yield significantly different results. Kalambokidis' other concern is to ensure that the funding of his spending variables was all done at local and state levels. This is crucial information because if the federal government provided the funding, we would not expect the social spending variables to be reactive to levels of immigration in a local setting. This error would obscure the relationship between immigrant population levels and local public goods spending.

As previously stated, Kalambokidis ran regressions on his 2011 data and 2005-2012 panel data using both percentage of total spending and per capita levels of spending. When he ran his 2011 regression, the different measures of spending led to different results.

His 2011 cross-sectional data using percentage of total spending on specific public goods shows that the size of the foreign–born population has statistically significant negative effects on spending for education (-0.263, $p < 0.05$) and highways (-0.161, $p < 0.01$), as well as a negative impact on police (0.0683, $p < 0.05$). These results could be explained by the anti–immigrant and nativist sentiment theory that greater ethnic heterogeneity in the population has a negative impact on public goods spending. The observed effects could also be explained by proportional changes in spending. For example, the proportional reduction in education spending may not have been a real reduction, but rather adjustments in spending for other public goods.

In an effort to correct the ambiguity of using proportional spending measures, Kalambokidis ran the regressions using per capita spending data as the dependent variable. The cross–sectional per capita data still shows a statistically significant negative effect of foreign–born on spending for highways, but did not show a statistically significant result on education, and actually showed a statistically significant positive effect on police. These results imply that the negative impact of immigrants on education spending can probably be explained by changes in other types of public goods spending, for example an increase in police spending, rather than by a real reduction in education. Using per capita spending measures comes with its own problems, however, as a higher foreign-born population is associated with higher per capita spending. Thus, the positive effects on spending are difficult to parse out between overall spending and specific public goods spending.

The outcomes of fixed effects regressions of the 2005 – 2012 panel data are contradictory to the cross-sectional 2011 data. The foreign–born variable in the 2005 – 2012 data show no statistically significant results on any type of spending. These results are similar to Alesina, Baqir and Easterly (1999), who also found that ethnic heterogeneity had a significant negative effect on cross-sectional data, but that this negative effect disappeared in panel data.

When Kalambokidis ran a regression analysis using per capital levels of spending of the 2005 – 2012 data, the results were different from all the previously discussed regressions. This regression showed statistically significant positive effects of foreign – born population on education (0.0408, $p < 0.05$), public welfare (0.0473, $p < 0.01$) and police (0.00373, $p < 0.05$) spending. These results can be explained by the hypothesis of direct proportionality between the population of immigrants and public goods spending. The results can also be seen as an increase in overall spending due to the population growth, without a particular focus on public goods spending.

Kalambokidis offers several possible explanations for the contradictory outcomes. For the regression on the 2005-2012 percentage data, he cites the limited amount of years in the data set as an inhibiting factor. With so few years there may not yet be enough data to display any significant effect of immigrants on public goods spending. Furthermore, the limited number of years in the data set makes it impractical to lag the independent variables, even though lagging is more suitable in this case because policy changes and budget adjustmentstake time to have an observable effect on society. Kalambokidis also cites the 2008 global financial crisis, which is contained in the panel data set, as a significant disruption of the economy and public spending.

Kalambokidis suggests improvements could be made to increase the validity, accuracy, and reliability of this study. One such improvement is to use longer data panels so that more observable patterns can emerge. Longer data panels also allow for lagging the independent variables, so that the effects of any policy changes may be factored into the analysis.

Although Kalambokidis' regressions are contradictory and his results are inconclusive, his study lies in an exciting vein of work focused on measuring social issues by using economic research methods and data analysis. In the coming years, it will be interesting to see the different ways in which researchers continue to apply these methods to identify, measure, and confront social problems. **eq**

Economic Health Indicators of Emerging Countries

Sniffling, sore throat, high body temperature: these are all early indicators of an impending illness. Identifying such symptoms is key to treating any disease effectively. Just as doctors monitor a patient's symptoms, macroeconomists monitor economic indicators as an attempt to prevent our economy from getting "sick".

RESEARCH BY JINCHEN HUANG | WRITTEN BY ANTHONY OATES

During 2008-2009, the global economy suffered one of its worst recessions in recent history. A credit crunch in the housing sector led to banking institutions scrambling, resulting in a major financial crisis. According to the United States' Treasury Department, 8.8 million jobs and $19.2 trillion in household wealth were lost, and home foreclosures skyrocketed. In the following years macroeconomists have done a substantial amount of research on what pushed the global financial system to the brink. Similar to how doctors compile symptoms of a new disease in order to increase chances of early detection, macroeconomists pour through economic data in order to compile a profile of warning signs. An advanced warning system would allow governments to formulate and employ proactive policies for combating economic contractions instead of reactionary ones. However, most research and analysis done on the recent global recession places emphasis on developed economies. Emerging countries were virtually omitted. Countries such as Indonesia, Brazil, and Mexico are substantial exporters of raw materials and manufactured goods. Considering that these up-and-coming economies are responsible for around fifty percent of global GDP growth, research in this field is more important than ever. This is probably why UW's undergraduate, Eric Huang, decided to research on prominent economic health indicators for major developing economies.

Eric zeros in on seven major emerging economies (in terms of total GDP) in his study. These include Brazil, Russia, India, Mexico, Indonesia, South Africa, and Turkey. Each of the countries listed have experienced high GDP growth rates over the past ten years. They also all experienced economic contractions during 2008-2009. Although China and Argentina fall under the umbrella of the major emerging economies, they are not included in the study for several reasons. First, the 2008-2009 financial crisis had a mild economic impact on the Chinese economy. Second, there is an absence of complete and reliable data from Argentina. Data from the selected GDP indicators was collected on a quarterly basis from the first quarter of 2003 through the fourth quarter of 2013. Why pick this specific time period for a sample? There are three reasons: 1) Some countries used in this study did not begin collecting data on selected indicators until the 2000s. 2) The study was conducted on the 2008-2009 recession, therefore Eric wanted to avoid encompassing historical trends not relevant to this time period. 3) Macroeconomic data from developing countries was not always well processed nical and economic conditions. In order to construct an accurate model, Eric pulled data from multiple sources during his research. These sources included databases from the IMF's International Financial Statistics, Economic Research by the Federal Reserve Bank of St. Louis, and the OECD iLibrary. He also adjusted for seasonally patterned variables to ensure consistency.

Upon analysis, share prices are found to be a statistically significant indicator and are positively correlated with GDP growth among four of the seven countries tested. Thus share prices is this study's leading forecasting indicator of economic health.

Utilizing previous models studied throughout various economic courses, Eric selected seven macroeconomic indicators that best represented economic health in developing countries. These indicators include current account, industrial output, net exports, credit growth, term spreads of interest rates, real exchange rates, and share prices. Current account is composed of a country's trade balance. It includes net income from abroad and net current transfers. Eric utilizes a current account to GDP ratio as his variable. This ratio evaluates whether an economy is a net lender or borrower. A heavily negative ratio suggests that the country's economic growth is primarily driven by lending. Such growth is seen as unsustainable. The next variable utilized was Industrial Output. When a country experiences a period of high economic expansion Industrial Output rises with increased investment and productivity. On the other hand, if a country experiences an economic contraction then Industrial Output decreases as investments dry up. Since exports are an incredibly important factor for economic growth in developing countries, Eric selected this variable for his study. Many emerging economies export raw materials and finalized goods to developed nations. Therefore a sudden decrease in net exports is indicative of an economic downturn and vice versa. Another economic indicator examined is private credit growth. Eric reasoned that in economies driven by consumption, private credit to GDP ratios can indicate the formation of bubbles. Private credit is represented usually as bank lending for consumption spending. In the months leading up to the 2007-2008 financial crisis, the United States' private credit to GDP ratio spiked. In addition, exchange rates are another indicator Eric tests with his model. Exchange rates measure the value of a country's currency relative to other nations. If the relative value of a country's currency begins to fall, we can assume, based on economic theory, that its economy is suffering a contraction. This is due in part by the decrease in demand for that country's currency. The last indicator Eric evaluated with his model was share prices. Share prices are reflected by total value of a company's financial assets. Eric's rationale behind this choice was based on the idea that when a company's share price value is high they have high cash flows and, in turn, a higher capability towards growth. Given this information, there is a positive relationship between share prices and economic growth.

Eric employed several statistical procedures in order to validate the best indicator for predicting a recession in emerging economies. His autoregressive model uses the cumulative time series data of the individual economic indicators to predict percent change of GDP growth in a specific period (in this case 2008-2009). Since these developing nations have similar economic structures, the forecasting model also accounts for the heterogeneity of the countries. The idea of forecasting is based on using current information to predict future events. Therefore, Eric had to devise a method to decide what time lag gave an indicator the most accurate prediction of GDP change in 2008-2009. To find the optimal time lag it took for an economic indicator to impact GDP growth in the years 2008-2009, Eric used an Akaike Information Criterion (AIC).The AIC measured the relative quality of his regression forecast model for a given set of time lags. The lower the produced AIC value, the lower the odds of error. By choosing the time lags with the lowest AIC value, the chance of error within the forecasting model is greatly reduced. Once accurate time lags were found for each variable, they were compiled into forecasting models for each individual country.

The final forecasting models underwent an F-test in order to determine which economic indicator was the most significant in predicting percent change in GDP. All variables significant with a p-value below 0.05 are argued to hold a strong correlation with economic expansion and contraction. Upon analysis, share prices were found to be a statistically significant indicator and are positively correlated with GDP growth among four of the seven countries tested. Thus, share prices are this study's leading forecasting indicator of economic health. Intuitively, share prices are an excellent indicator of economic health. They are often viewed as a reflection of confidence in an economy's future. If economic outlook is pessimistic, aggregate share price tends to dip. If economic outlook is optimistic, then aggregate share price tends to rise. However, this is not to say that the other indicators do not have an equal forecasting value. In addition, results from the F-tests indicate that current account, net exports, private credit growth, industrial output, and exchange rates contain some level of statistical significance to a number of the major emerging economies. Also, there may have been other unknown indicators that can carry warnings about economic health. Due to the time and data limitations the study was not able to detect such absent indicators. Throughout the duration of his research, Eric realized how truly complex economic forecasting is. Modern economies in the real world are so intricate that numerating all the causes of expansions and contractions is a near impossibility. Economists must utilize econometric tools in order to discover factors that prove to be economically significant in the long run.

As the global economy continues to grow and become more interwoven, economic forecasting in developing nations has become increasingly crucial. Advances in forecasting techniques to capture the dynamics of developing economies could increase the effectiveness of foreign investment. More accurately targeted foreign investment and aid to these nations could promote healthy GDP growth. Hopefully Eric's unique angle on economic research is only the beginning. **eq**

Philosophizing Economics with Professor Steven Durlauf

Interview by Amy Wang

I have been warned before speaking to Professor Steven Durlauf. Mostly by students who have worked with him and by students who want to work with him. They tell me speaking to him is like confronting a wild storm; it is not until long after the conversation do you begin to find unheralded pieces of information scattered everywhere from the wealth of topics he was able to confer. The EQ staff was able to sit down with Professor Durlauf during his sabbatical, to unravel the man and mind behind this renowned scholar.

In a way Steven started just like us. Adamant to study philosophy in college, he was confronted by his father's withdrawal of financial support in exchange for practicality. "Just take an econ class," requested his father. He had the impression that the subject is "hard and boring" but thought Steven might like it because it is math. Steven grew to like his economics courses and realized that "philosophy disillusioned him" --- philosophy at Harvard was taught by world-class scholars, but Econ 101 was taught in sections by grad students.

Today he works to combine his love for thinking and numbers. With philosophy and sociology as muses, Professor Durlauf works to not only ask questions but to formulate them too. He describes his research as attempts to integrate sociological ideas into economic analysis. In his own words, he helped "pioneer the application of statistical mechanics techniques to the modeling of socioeconomic behavior and has also developed identification analyses for the empirical analogs of these models." "Just as ideas in psychology are now permeating through behaviorial economics," Durlauf insists, "there should not be one social science." Each orientation of it should not have principle barriers on how to think about behavior. Modify existing theoretical structure so they can better capture the world has always been his mission in research.

Throughout the range of courses he taught, from the

comprehensive Econ 102 (Introduction to Macroeconomics) to the specialized Econ 580 (Research Project Design) to an undergraduate class close to his heart on the subject of equality, Durlauf has long proliferated the idea that economics has ways of thinking through problems that have wide applicability. He listed three examples. First is the notion of equilibrium. When individuals and firms are interacting, incentive changes cause not only individual effects but also an equilibrium effect. Applications can be seen in the notions of externalities in public policy making. Second is the employment of choice-base logics. This allows policymakers to better analyze and implement public policies. For example, do mandatory seat-belt laws make people safer or do they encourage more reckless driving? How does policy alter people's choices? Thirdly, and perhaps most substantive, is that economics provides training in contextual data analysis. As opposed to a course in statistics, economics trains its students to think quantitatively when facing a social phenomenal.

As powerful the training economics offers, Durlauf is fully aware of its limitations. He stresses that basic models taught in college are basic. That is, it's naïve to think maximizing utilities is great and that they don't involve deeper ethical issues. What he strives to create is a more permeable barrier in which "ideas from philosophy enters some aspects of economics, ideas from economics help clarify philosophy."

This marriage of societal morals and quantitative analysis forms his research foundation. "In any policy evaluation, it is inevitable that we have to talk about ethics," Durlauf cautions, "But a word that rarely shows up in that conversation is fairness." While he doesn't think the fact-value dichotomy exists, when one moves on from positive descriptions of phenomena, any normative claims we make have to have well-defined justice considerations. "Econ focus on positive or normative questions where the interesting part is not the ethical objective. For example, in thinking about inequality, one has to distinguish between inequality and disadvantage. So it's one thing to say I want things to be more equal --- for those who have less I wish them to have more. But if I just cared about inequality then I want to take the stuff from the rich and throw it in the garbage!"

Often, economic assumptions mask the larger social question. "In the field of economics, we don't tend to think of income as zero-sum," Durlauf explains, "but there are some domains where that is true." The story is very different in the political sphere; one person one vote is ideal but individuals have differential ability to spend money on politics therefore each has differential political power. The inequality in the economics sphere manifests itself in the political sphere where strict equality has a different interpretation. Once unexamined morality can stand in for the social responsibility, policymaking would be reduced to a vocation, its practitioners untethered to any consensus regarding societal welfare.

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Before the conversations drew to a close, Durlauf parted us with some tips for approaching social problems. "When I think about particular phenomenon, I construct in my head a heuristic, mathematical model that captures the property of it." Through the stochastic process, random system analysis can be employed to model that. Another direction is to ask whether or not one can identify behavioral mechanisms that can underlie such a mathematical structure."The third is that I read like crazy. I spend a lot of time on any problem reading outside of economics."Since economic models are approximations, it is incredibly important to know what theories outside of economics have to say about the problem at hand. **eq**

image from CNNMoney

From Low-Cost to Legacy: Southwest's Flight

Research by James Anthony Cozart | Written by Amrit Kaur Hundal

The airline industry is a complex machine greatly impacting both professional and personal lives for the majority of both domestic and global population. Serving a wide reaching demographic of both individuals and families, airfare prices are influenced by many factors. Intrigued by these fluctuations in prices, Cozart analyzes inter-industry competition within the airline sector to make sense of airfare pricing in response to this competition.

To provide some background on this varying competition, a little historical information is needed to comprehend the building tension within the overall industry and large firms representing the industry. However, it is necessary to begin with a few definitions that will be used within this piece and in other sources of literature about airline competition.

Firstly, a legacy carrier is an airline firm that had established inter-state routes prior to the Airline Deregulation Act of 1978; subsequently, these firms were affected by the Act. A low cost carrier, then, is a term coined in a slightly disparaging manner. These firms are post deregulation start-up carriers that increased market competition. It is noteworthy that both terms categorize American airlines. Prominent characteristics that distinguish the two classes of airline firms are mainly concerned with available amenities for passengers. Legacy carriers are known to provide higher quality services to their passengers such as first class or business class seating and opportunities to join frequent flyer programs; not to mention an increase in cabin service quality and possible in flight entertainment. The rise of low cost carriers was largely due to the Deregulation Act of 1978 mentioned above; other objectives of the Act were to decrease government control over airline and potential routes to be employed by the airlines. As a result of the Deregulation Act, the increase in competition from airline firms boded unfavorably for several legacy carriers. This was so because low-cost carriers, as their name indicates, were economically favored by a subset of the greater demographic.

Additional complications for legacy carrier came in the early 2000's, particularly post 9-11. In fact, four major bankruptcies and two major mergers were products of this time; all legacy carriers reported profit reduction. Several developments have been made in order to better understand and provide explanations to these trends. One such explanation details the 'burst of the dot-com bubble' in which consumers had access to large quantities of electronic information and increased communication leading to a decrease in consumer willingness to pay prices demanded by legacy carriers. Similarly, another potential implication of profit reduction is a decrease in demand following stringent security measures contributing to an increasingly wary post 9/11 environment. These concerns appear to explain, at least partially, the unexpected profit reduction following economic deregulation.

James Anthony Cozart's senior honors thesis focuses on the concerns faced by legacy carriers. Cozart's empirical analysis of incumbent or legacy carrier(s) response to low-cost carrier entry particularly highlights competition between legacy carriers and low-cost airline carriers. Similar perplexities of dominant incumbent firms, suffering financially with negative shareholder equity, despite benefiting from economics of scale, greater access to capital markets, market visibility, and infrastructure advantages, are central to Cozart's analysis. Although they face similar input costs and serve a demographic with similar preferences, low cost carriers have found ways of expanding and gaining market power. To emphasize this competition, Cozart specifically details the response of incumbents or legacy carriers (American, Continental, Delta, Northwest, United, and U.S. Airways) to low-cost carrier, Southwest Airlines.

Cozart analyses low cost carriers and their recent exponential growth over the past few decades, choosing Southwest Airlines as a case study that has been doing relatively well since the early 1990's. "The Southwest effect" was a term coined in order to describe the powerful impact of Southwest's expansion into new markets. In recent years, however, the impact of this effect has been reduced as legacy carriers have become introspective through larger macroeconomic forces and have spent more time reconsidering their business strategies and management systems. Additionally, the emergence of more low-cost carriers has provided additional competition to Southwest, possibly diminishing its influence. The empirical analysis is a study in which prices and quantities of incumbents before, during, and after Southwest's establishment of an operating presence on a specific flight route is recorded.

Cozart argues that legacy carriers respond to an anticipated Southwest entry to a particular route with markedly less severe price cuts than documented in prior literature. This previous literature is centrally defined as work done by Goolsbee and Synerson in 2008. Cozart makes baseline assessments on statistical work produced by Goolsbee and Synerson such as fixed-effect regressions of data samples from 1993-2004 and 2005-2012. Upon expansion of this type of statistical methodology, Cozart tests incumbent responses in regards to general threat of entry, among hub and non hub locations, following bankruptcy proceedings. General findings show that the decline in air fare does not take into effect Southwest's potential entry immediately but four quarters later. This was when Southwest fully established a presence at the second endpoint airport of a threatened route.

Southwest's entry has been, overtime, less intimidating to incumbents who previously felt pressure to immediately changing prices. Cozart argues that throughout the course of its success, Southwest has become more of a legacy carrier itself.

Southwest influence on the larger airline industry has been expanding since the early 1990's as it has merged into markets and routes previously dominated by legacy carriers. Aside from adding services to more than 35 airports since 1993, Southwest has seen a considerable increase in annual revenue and passenger volume. By entering principal routes of legacy carriers, Southwest has been a domineering force prompting great inter-industry competition. In the late 1990's Southwest was most active in expansionary efforts with entry into relatively small markets. However, starting in 2005, Southwest employed a more effective strategy: it began to expand into legacy airline hubs or focus cities. This was primarily accomplished by gaining government controlled slots at major airports such as New York LaGuardia, Newark and Washington Reagan that were previously held by bankrupt airline firms.

Despite the imminent success Southwest has in gaining market power, legacy carriers appear to have a certain degree of consumer loyalty. It is estimated that the number of passengers carried by incumbents on threatened routes increases as incumbents decrease average prices to better compete with Southwest's airport entry. Indeed other means of survival for legacy carriers have been merging with other carriers that provide several advantages: large cost advantages over low cost carriers, increasing loyal consumer database, and generally doubling strengths from having greater experience relative to low-cost carriers.

A large deviance from existing literature noted by Cozart details the more subtle effect of Southwest's entry on airfare prices than previously considered. Moreover, Cozart asserts that the extent and intensity of competition between legacy carriers and Southwest has likely declined.

A large implication of Southwest entry into hub airports for legacy carriers has been the added differentiation between luxuries afforded by legacy carriers versus Southwest airlines. Hub airports are qualitatively and quantitatively different; in his research Cozart tests incumbent response to Southwest's entry as it pertains to hub and non-hub locations. To explain further, a hub premium exists in hub airports giving added preference to frequent flyers and the subset of the flying demographic that would gain and enjoy utility provided by lounges. Cozart argues that legacy carriers may feel they are able to compete with Southwest without significantly decreasing fares as a result of the products and services they present at these locations. Moreover, Southwest and other low-cost carriers have increased fares considerably. Fares of legacy carriers are now on average approximately 1.35 times those of low cost carriers. This ratio has decreased overtime, perhaps to favor smaller price-cuts in order to minimize risk of losing existing customers.

The main empirical finding Cozart emphasizes on through his data manipulation is that incumbents no longer change prices as a preemptive measure and that Southwest's entry has been less intimidating to incumbents who previously were pressured to immediately change prices. In fact, Cozart urges that throughout the course of its success, Southwest has become more of a legacy carrier itself. Ultimately, Cozart concludes that incumbent legacy carriers no longer respond to Southwest as the threatening start-up it once was.

In order to truly understand airfare fluctuations, the inter competition especially relative to legacy versus low-cost carriers should be considered as a strong underlying factor. Further study on the competition between incumbents or legacy carriers with low cost firms should involve a more focused look at anti-trust policy and how it has changed the size of the incumbent industry. **eq**

A Conversation with an Alum...

POPCULT Marketing

with WILLIAM MERRICK

Written by Neha Alluri

POPCULT Marketing is a start-up founded in 2014, by a UW-Madison alum William Merrick. The company offers marketing and advertising services to businesses and helps students gain professional entry-level experience by training them. A growing business, it is constantly growing around three areas: Product, Professional Services and Social Ventures.

An Economics and Psychology major, Merrick narrates his story and tells us what inspired him to start POPCULT a company that connects businesses to students.

POPCULT Marketing is their product. It is a venue that matches budding marketers with experts to work with local businesses. Their professional services include business development and administration – from setting up a point of sale and inventory systems to finding employees, among other things. The Social Ventures division currently provides job opportunities to the homeless and poor in Madison to carry out weekly clean ups and pays them individually for their efforts. The company's founder, William Merrick, says that their Social Ventures are a way of giving back to the Madison Community. He says, "We believe that a company can do a lot of good with simple efforts - and This Lovely City is how we're doing that today".

Tell us your story. I was raised in Madison - half in the city and half in the country. After graduating early from Madison West High School, I spent many summers working at Rutabaga, an outdoors store that sells canoes and kayaks and also provides lessons for canoeing and kayaking.

I was in the Navy for about three years, returned and worked in a factory, Research Products. I attended MATC and finally transferred to UW Madison. I was always interested in innovation and technology. I was really thinking of doing something in Industrial Engineering and Systems design but near the end of my time at UW Madison, I discovered a local tech start up – SOLOMO. It all started when we bonded over BBQ and 8 months later I found myself working there.

It really changed my life. I liked start up businesses and was curious about businesses in general. I grew a lot in that company as I learnt the ins and outs of a company- from the software design process and marketing process to partnership development. But near the tail end, I discovered a problem in small businesses. They were problems for students so I decided to start POPCULT Marketing. The problem for students is getting real world experience in an environment that provides guidance and flexibility. Right now, there is simply no safe place to fail along the career path. Also, there's a problem transitioning from college to career - because the cultures are so different. In college, you have a professor who can explain things to you. There is no such person defined so clearly in your career - you have to find a mentor, and it's a two-way street with that person. Also, the game is all-or-nothing. In real life, you don't get a C with a chance for extra credit or a make-up exam - you get fired, you lose a client. There's more ambiguity and higher stakes. Through POPCULT, we're creating a bridge between these worlds.

Which was your favorite Economics class and how has it impacted your career?

I'll do two – one would be Raymond Deneckere's Industrial Competition and Strategy, which was about Bargaining and Auctions. Professor Deneckere's case study approach along with his attitude made the class extremely engaging. The subject matter of this class was the most applicable to real life out of everything else I came across. I learnt a lot of interesting lessons.

The other class was Thomas Cox's Quantitawtive Methods. The way he teaches makes people think differently. It challenged me in a way that no other professor has. The class really helped me build my analytical thinking and excel skills, which I will never forget. Most importantly, it helped me develop the attitude of an analyst. It sowed that seed in me. If you just want to have fun learning, you should enroll in Dan Quinn's Law and Economics.

What inspired you to start POPCULT Marketing? National brands don't perform well on social media. In fact it is probably a waste of time and money for them, they get engagement rates of less than 1%. Around 0.5% is good for many of these companies.

But local businesses, on the other hand, have a closer connection to people. They can afford to be social. Yet they don't have the time or money to hire an agency to do the work. When I saw these two problems together, I wanted to execute on it.

I give credit to The Soap Opera on state. Family owned businesses like it can benefit greatly from social media engagement but they do not take advantage of technology. They were my inspiration that led to the "spark". I wanted to help local businesses take advantage of today's technology.

Ultimately, I founded POPCULT to serve two groups of people - students and local businesses; it was the drive to change the way people work together. It has always been an expression of something deeper. I hoped to change something fundamental. I wanted to design a new collaborative approach.

I noticed every time I was hiring students, like myself, they came out of the classroom setting, where they were confident, into the business setting and lost their edge. It happened with me – for the longest time, I didn't know if what I was doing was right. I constantly needed to ask somebody questions like "Is this okay?" and wanted reassurance to make sure what I was doing was right. Confidence is really the ability to act without hesitation and professionals are confident.

What is a typical day at POPCULT like? It involves a lot of communication. I'm responsible for the internship program. I am constantly answering emails with questions, diving into client accounts to get feedback. It's all very hands on, no micro management. It is really all about constantly engaging everyone in the organization. We have around 20 interns and 6 clients currently.

How is the environment in Madison for start-ups? Madison has a very business friendly culture. That's a positive. However, Midwestern businesses are very risk averse, they hesitate a lot to explore new things. This is not a good attitude for startups. Fortunately, we have a low price point. Startups are also an inherently "new thing".

There is a lack of capital. But there are a number of local organizations like the Wisconsin Innovation Network, Technology Council and Angel Fund that are helping to fund us. Tom Still, the President of the Technology Council and Reese Cheeks are two individuals who are working with the state to bring more investment into Wisconsin.

There was a partnership program with an investment firm in California called "Money for Minnows". The idea is to find a bunch of small guys and create a "fund of funds". So at a money end, there is development but a change in the business culture is much slower. In order for startups to break out of their own shell and get into the broader market, people have to use whatever it is they are doing, and that takes risk. It's an attitude thing. We'll see how that develops.

What are your future plans for POPCULT? As a short-term goal, I want to get it right internally. Everyone in our organization needs to harness the values of POPCULT. In the medium run, it is to outgrow Madison. I estimate 400 students in the program and 50 businesses as clients. I want to recruit students from all over to cater to companies beyond Madison. The plan is to replicate this model in other states. I hope to take it to a second campus by next year. We are building new technology right now to enable that.

In the long run – I hope for POPCULT to be on every major campus in the U.S., get overseas and create a collaborative environment for small businesses and local students.

UW Madison has several ambitious entrepreneurs. Do you have any words of wisdom for them? How about words of caution? Stop asking what you want to do and start asking why you want to work. You could go to Central America, find a small island and catch crabs to live. I challenge people to stop asking what they want to do. Unless you want to be a lawyer or doctor, you won't get a why with the what. If you want to fix people – you become a doctor. If you like to argue – you become a lawyer. For everybody else, you will never know what you are going to do everyday. But why – you can figure that out. Once you do, nothing is going to stop you from going after it.

I'm a very risk- seeking person so giving young badgers some words of caution is difficult for me. You need to believe in impossible things. Things don't happen over night, so don't let self-doubt hold you back. Be wary of the norm but cautious of what's normal. Be conscious of the herd, everybody is moving in one direction. Constantly ask yourself why and be cautious of what's easy.

POPCULT Marketing dissolved as of June 2015, but Merrick has spearheaded a new company, Promote Local. **eq**

Equilibrium is made possible by the students who have researched, written, designed, edited, and created each word and every page.
To join Equilibrium and help publish Volume 6
Contact: uwequilibrium@gmail.com