

Assessing the Current and Future Economic and Tax Revenue Impacts of Student Loan Debt in the Colorado Economy

Introduction

Nationally, outstanding student loan debt now exceeds \$1.1 trillion, is now second largest debt component, after mortgages, on household balance sheets, and is the only form of household debt that experienced no deleveraging during the Great Recession. While of late much has been written in the popular media about the increase in education debt, the academic research on the economic effects of student loan debt is just beginning to develop. Previous studies explored the relationship between increasing student loan debt and homeownership¹ and occupation choices², but little in the literature explores the causes of the student loan debt increase any of its other economic or fiscal effects. Additionally, the current literature assesses only the current time period. None of the academic studies attempt to forecast the future effects of student loan debt burdens on household consumption or state tax bases.

Increasing household debt loads have the potential to create an economic drag as monthly debt payments decrease a household's ability to engage in other consumption activity. And, decreased household consumption has public finance effects as well. Many state and local sales tax systems are dependent on the retail sales which form the base from which the majority of tax revenues are derived. Because of the potentially widespread economic effects of this recently fast growing source of household debt, it is important to better understand both its causes and its effects. This study will inform these issues by addressing the following research questions:

- What are the determinants of the growth in student loan debt and how is that debt forecast to grow in the future?
- What is the magnitude of the current and future economic effects of this increasing debt on household consumption?
- What will be the resulting impact on state and local sales tax bases?

Methodological Approach

Our methodology is designed specifically to answer the three research questions stated above. First, we will build a time series model to assess the determinants of the increase in student loan debt and forecast the future trajectory of this debt. Members of our team already run forecast models of the Colorado macroeconomy and demographics which will be critical inputs to our work on this project. Therefore, for this research, we will use the state of Colorado as the level of analysis.

Once we have a forecast of student loan debt, we will use that to assess the current and future impact on household spending and the resulting state and local sales tax bases. For these analyses, we will use a simulation method employing synthesized populations and households which is widely used and well

¹ Houle, Jason and Berger, Lawrence, 2014. Is student loan debt discouraging home buying among young adults? http://www.appam.org/assets/1/7/Is_Student_Loan_Debt_Discouraging_Home_Buying_Among_Young_Adults.pdf

² Rothstein, Jesse and Rouse, Celelia Elena, 2007. *Constrained after college: Student loans and early career occupational choices*. NBER working paper 13117. http://www.nber.org/papers/w13117.pdf?new_window=1

documented in the transportation demand management and land use literature³ but never employed in analyses of the consumption economy. Synthetic populations and households are derived from Census data, typically through a Monte Carlo simulation, to conform to future demographic control totals for the jurisdiction. The specific controls are determined by the research design objective. For this work we will use controls that are most likely to affect household consumption such as income, age of householder, educational attainment and household size. Data for the creation of these synthetic households will come predominately from Colorado economic and demographic forecasts and the US Census Bureau's American Community Survey. We will use one of the publicly available algorithms, for example Popsyn⁴, for the generation of the current and future synthetic households we simulate for this study.

Once created, the synthetic households will form the basis for the analysis of current and future consumption patterns. In transportation planning, the behavioral simulation is completed by predicting behavior of the individual households using data collected in surveys from travel diaries. For the consumption economy, this sort of surveying will not be necessary since comprehensive surveys of household consumption patterns are completed regularly in the Bureau of Labor Statistics' Consumer Expenditure Survey (CES). We will use the CES data instead of completing an independent survey. CES data are stratified by income, education, age and other demographics to which we will control the development of our synthetic households and as a result we can use the data in the CES to quantify the consumption patterns of each of our future synthetic households according to their specific demographic profiles. The aggregation of the consumption in these individual households provides us with a level of baseline current and future consumption spending in the economy.

To incorporate the effect of student loan debt on those consumption patterns, we will use our forecast of student loan debt to reduce the disposable income of the future synthesized households. Comparing our forecasts for baseline household consumption and household and consumption after accounting for student loan debt will give an estimate of the impact of student loan debt on the state's economy.

Finally, consumption data from the CES is separable into spending that is subject to sales tax and that which is not. By running the same baseline vs. reduced disposable income simulation as above only for categories of purchases subject to the sales tax, we will estimate of the impact of student loan debt on Colorado sales tax revenues.

³ See for example Transportation Research Board of the National Academies, 2009. *Advances in Agent Population Synthesis and Application in an Integrated Land Use and Transportation Model*.

<http://trid.trb.org/view.aspx?id=881312> and Muller, Kirill and Axhausen, Kay W., 2010. *Population synthesis for microsimulation: State of the art*. file:///C:/Users/Phyllis/Downloads/3deec517bbebb9606c.pdf

⁴ <http://popsyn-win.software.informer.com/>

Budget

The budget for this project is \$20,000 and is comprised of research assistance, data acquisition, and travel for the principal investigators to present the findings. The breakdown of the budget is as follows:

- Data acquisition – Consumer Expenditure Survey microdata - \$2,500
- Research Assistance - \$10,000
 - CES data (\$2,500)
 - Synthetic households data and programming (\$7,500)
- Travel – Two conference presentations for PIs Bernasek and Resnick - \$5,000

Submitted by:

Dr. Alexandra Bernsasek
Professor and Coordinator of Graduate Studies
Department of Economics
Colorado State University
Alexandra.Bernasek@colostate.edu

Dr. Phyllis Resnick
Lead Economist
Colorado Futures Center at Colorado State University
Phyllis.Resnick@colostate.edu

Curriculum Vitae

The pages that follow contain the CV for Dr. Resnick. Dr. Bernasek is out of the country and does not have current access to her CV. We will follow up with Dr. Bernasek's CV during the week of May 26.

Phyllis A. Resnick, Ph. D.

Lead Economist
Colorado Futures Center
Colorado State University
Denver/Fort Collins, Colorado

2698 Hedgerow Circle
Lafayette, CO 80026
+1 303.579.8992
Phyllis.Resnick@Colostate.edu

Education

Ph.D. Public Policy, University of Colorado-Denver. 2008

Dissertation Research: *Do Tax and Expenditure Limitations Impede State Tax Reform Efforts?*

Dissertation Summary: An econometric exploration of the relationship between state level fiscal cap tax and expenditure limitations and the process and frequency with which states amend their tax codes.

M.A. Economics, University of Colorado-Boulder. 1993

Fields: Natural Resource/Environmental Economics, Public Finance, Math/Econometrics,

B.B.A. School of Business Administration (Accounting), University of Michigan-Ann Arbor. 1987

Non-Degree Program in Social Work, Hebrew University, Jerusalem. 1989

Awards

2012 - Most Effective Education from Governmental Research Association -state fiscal sustainability study

2011 – Most Distinguished Research from Governmental Research Association- state fiscal sustainability study

2006- Lincoln Institute of Land Policy Dissertation Fellowship

1996- Pi Alpha Alpha National Public Affairs Honor Society

1992- Reuben A. Zubrow Graduate Fellowship for the Teaching of Economics

1991 and 1992- University of Colorado Protected Class Doctoral Fellowship

1991- Department of Economics Cooperative Research Fellowship

1991- Dean's Small Grant, University of Colorado, Boulder

1987- Beta Alpha Psi Honorary Accounting Fraternity

Professional Experience

Lead Economist, Colorado Futures Center at Colorado State University (2013 to Present)

In February, 2013 appointed lead economist for the newly created Center for Colorado's Future, a new public policy institute created at Colorado State University

Major 2013 Studies:

- Assessing long-term fiscal sustainability in Colorado
 - Forecast models for the state's economy and all general revenue sources
 - Developed and evaluated revenue potential and impacts of recommended tax policy changes
 - Integrated the implications of the state's TELs into the analysis
 - Directed predecessor analysis on state fiscal sustainability which won two national awards
- Analysis of the tax implications of Amendment 64, the Colorado amendment legalizing marijuana
 - Built baseline model of the size and revenue capacity of recreational marijuana market in Colorado
 - Built companion web based interactive models for alternative estimates of revenue potential
 - Study has received national and international attention as the first to estimate tax potential of this new market and is Colorado's most widely cited work on the subject

Independent Consulting - Selected Clients and Projects (2005 to Present)

Colorado Governor's Office of State Planning and Budgeting, Economic Consultant

- Contributor to the Governor's quarterly economic forecast

- Forecast and evaluate trends in major macroeconomic variables
- Forecast state revenues
- Perform special analysis each quarter. Examples are:
 - Importance of entrepreneurial activity to job creation in Colorado
 - Structural changes in the state's labor market
 - Role of proprietor employment in the state's economic recovery

State of Colorado Department of Corrections

- Cost benefit analysis of the State Wildland Inmate Fire Team

AARP

- Meta-analysis of the return on public investments in independent living for seniors through the Older Americans Act

Freeport Mc-Mo-Ran Effective Tax Rate Study

- Authored a study evaluating comparative severance and property tax rates for molybdenum, coal, and oil and gas

North Front Range Metropolitan Planning Organization, 2040 Economic and Demographic Forecast

- Economic and demographic projections for the northern Colorado region

Colorado Health Foundation Evaluation of the Budgetary and Economic Impact of Medicaid Expansion under the Affordable Care Act

- Developed economic impact model to assess the effect on the Colorado economy of Medicaid expansion
- Presented findings to both the Governor and state legislature
- Study was instrumental in Colorado's decision to expand Medicaid

University of Denver Center for Colorado's Economic Future, Fiscal Sustainability Study

- Lead economist on study assessing the fiscal health of the state government as requested by the State Legislature (SJR 10-02)
- Developed and executed models to forecast the state economy and revenue system to 2025
- Co-authored report and presented findings at over 70 public meetings statewide including a Gubernatorial briefing
- Study received two national awards from Governmental Research Association

State of Hawaii Revenue Sustainability Study

- Develop models to assess fiscal sustainability in Hawaii particularly as it relates to providing services at state and local levels to population whose demographics are changing due to aging and migration to the islands

Engaged Public, Backseat Budgeter Budget Transparency Project

- Prepared state budget analysis and revenue/expenditure options for balancing the budget for use in on-line Backseat Budgeter interactive web based application in which citizens can attempt to balance the state budget

Utah Foundation and Great Outdoors Colorado, Economic Impact Analyses

- Multiplier studies of
 - The economic impact of the Intermountain Power Project on Utah's economy
 - The economic impact of the use of lottery funds for the development of recreational assets in 14 regions of Colorado

City and County of Denver, Revenue Sustainability Study

- Co-led effort to analyze Denver's long-term revenue projections
- Issued series of recommendations for long-term sustainability
- These recommendations led directly to the Mayor's Blue Ribbon Revenue Commission

City of Arvada, Colorado Analysis of Funding for Local Government Risk Management Activities

- Evaluate level of funding for this activity and make recommendations for adjustments to such
- Analyze the intergovernmental impacts of changes to charges for risk management services, particularly to the City's water utilities

Colorado Department of Transportation Revenue Model Project

- Collaborated in the development of models to forecast transportation related revenues for the State of Colorado
- Developed model to forecast general and cash fund revenues for the purpose of projecting the probability of a general fund transfer to transportation (as per state law)
- Models will be transferred to Department of Transportation staff for use in annual long term revenue forecasts

University of Denver, Economic Impact of Health Care Reform in Colorado

- Served on a team of university researchers collaborating with the New America Foundation on a study evaluating the economic impact of health care reform in Colorado
- Served as reviewer for multiplier model of coverage expansion for its effect on the size of the Colorado economy

State of Colorado Demographer's Office 2035 Economic and Demographic Forecast

- Collaborated in the development of State of Colorado's long term forecast of population, employment and major macroeconomic indicators
- Forecast serves as the basis for allocation of certain state funding and long term state demographic information

Xcel Energy Economic Forecast

- Long term trend macroeconomic forecast used for utility rate setting

Denver Regional Council of Governments

- Directed the DRCOG Socioeconomic Team of staff responsible for regional land use modeling, estimates programs, and general economic forecasting and modeling
- Lead the team developing next generation land use model for the region. Oversaw the prototype model run
- As per legislative mandate, serve as reviewer of sales tax forecasts for Regional Transportation District's FasTracks budget projections

Colorado Municipal League Municipal Finance Project

- Authored white papers on future of municipal finance in the state and presented findings at regional and national conferences
- Led a series of focus groups with finance directors around the state to identify financing challenges and revenue concerns
- Findings have been highlighted in *Denver Post* editorials and Colorado Public Television broadcasts

Colorado Department of Transportation Revenue Study

- Identified options to fund long term state transportation needs.
- Econometrically estimated revenue potential for those options over a 30-year time period.
- Authored revenue options report including considerations such as sufficiency, administrative burden and incidence of each option and presented findings to State Transportation Commission, Governor's Summit on Transportation and Transportation Trade Associations.
- Was retained to continue to support Governor Ritter's Blue Ribbon Panel on transportation finance.

City of Boulder, Colorado Structural Revenue Study

- Comprehensive review of revenue options for funding local government services and presentation of options to Blue Ribbon Commission.
- Analysis of the demographic trends impacting local government revenue, particularly sales tax, and translating those revenue trends into long-range revenue forecast for the City.
- Presented trend and forecast findings to Mayor and City Council, Commission, and City directors.

Denver Regional Council of Governments and North Front Range Metropolitan Planning Organization 2035 and 2040 Economic and Demographic Forecasts

- Develop long-range forecasts for population, labor force, jobs and other employment, and households by size, income, and age of head of household. Forecast results are integral inputs to DRCOG and NFR's land use and travel model update.

City of Aurora, Colorado Structural Revenue Study

- Analysis of political and economic impact of potential restructuring of the current revenue system. Includes analysis of the feasibility of implementation, the economic burden, and the sufficiency of the recommended changes to the system.
- Presented findings of long-term revenue forecasts to city leaders and Mayor and City Council.

Southeast Business Partnership, Englewood, CO, On-Line Tax Estimator and Economic Gardening Information Tool

- Project manager and tax analyst with a team of database, taxation, and GIS analysts developing applications
- Tax estimation utility combines specifics about the business with spatially-based parameters of the tax code to provide the estimate
- Information Tool allows user to query system for population and economic demographics within user-defined travel times of selected site
- First such application developed in Colorado, the state with the one of the most complex local government tax structures in the nation

Colorado Association of Realtors, Real Estate and the Local Economy

- Evaluation of the economic contribution of real estate to the state economy and to eight distinct sub-regions of the state. Presented findings at the Jefferson County Association of Realtor's Annual Meeting and served as media contact for the findings.

University of Denver (2004-2005)

Economist - Colorado Economic Futures Blue Ribbon Panel

- Appointed Lead Economist for panel convened to assess sustainability of state revenue system
- Led research efforts on state and national experience with tax and expenditure limitations, initiated constitutional change, tax reform, and relative tax burden analysis
- Presented research findings to convened panel and compiled analysis for support of final report recommendations
- Co-authored preliminary and final reports for panel

Center for Tax Policy (1999-2000 and 2001-2005)

Director of Research

- Developed and implemented research agenda advocating sound state tax policy
- Worked with Board of Directors to establish long-range research priorities for the Center
- Authored Center publications (selected list below under publications) and presented findings to civic groups, professional conferences, and legislative committees
- Performed research and presented findings on the impact of two prominent tax related initiative campaigns in Colorado (Tobacco, 2004; Refs C and D, 2005)
- Recruited and supervised contract and student researchers

City of Boulder (1992-1999)

Administrative and Budget Analyst - Department of Parks and Recreation

- Responsible for program analysis, budgeting, program revenue estimates, and development of methodology for program costing and fee recovery
- Managed and budgeted for 5 funds which jointly funded department operations
- Led the department's migration to the City's newly implemented financial system. Established the account structure for that migration in Parks and Recreation. Served on the city-wide committee charged with guiding the migration across systems.
- Implemented a market-based fee program that helped shift reliance to user fees from taxes
- Supervised financial assistants at 10 remote locations

Research Analyst – Fire Department

- Managed Fire Department operations and capital budgets
- Authored Fire and Emergency Services Master Plan
- Developed model to measure fire response times and identify locations for additional fire stations
- Analysis pivotal in securing funding and location for now operational 7th City fire station

Teaching Experience

Columbia University Middle East Research Center, Amman, Jordan (2012)

Invited to teach a fiscal decentralization class on-site in Amman, Jordan for high ranking ministerial officials

University of Denver, Graduate School of International Studies (1998-2000)

Methods of Policy Analysis

University of Colorado, Denver, Graduate School of Public Affairs (1997-2007)

Public Finance, Micro/Macroeconomics, Research Methods, Statistics

University of Colorado, Denver, School of Planning (2000-2002)

Statistical Methods for Urban Planning

University of Colorado, Boulder and University of Denver (1989-1993, 2001-2003)

Econometrics, Micro/Macroeconomics

Selected Academic and Professional Publications

Refereed Publications

Franklin J. James, Jeffery Romine, and **Phyllis Resnick Terry**, Big City Labor Markets and Immigrant Economic Performance. *Policy Studies Journal*. Vol. 30. 2002.

Peter deLeon and **Phyllis Resnick Terry**, Comparative Policy Analysis: Deja Vu All Over Again? *Journal of Comparative Policy Analysis*, Vol. 1, No. 1, September, 1998.

Sponsored Research

Phyllis Resnick and John Zimmerman, *Limited Market Value Colorado Style: Intuitive and Counterintuitive Effects*. Research sponsored by The Lincoln Institute of Land Policy.

Selected Professional Publications

- "Eat Your Brussels Sprouts: Hard Lessons on Colorado's Finances" *Colorado Municipalities*, December 2013
- *The Fiscal Impact of Amendment 64 on State Revenues*, 2013
- *The Economic Impact of Great Outdoors Colorado's Local Park, Recreation and Trail Grants on the Colorado Economy: 2004-2009*, 2012
- *Financing Colorado's Future: An Analysis of the Fiscal Sustainability of State Government*, 2011 and 2012
- *The Contribution of Intermountain Power Agency to Utah's Economy*, 2010
- *Responding to the Economic Downturn: Innovations from Colorado Municipalities*, 2009
- *The Future of Financing Colorado's Municipal Governments: A Cautionary Tale*, 2008
- *TABOR's Ratchet and Colorado's Future: The Impact of Referenda C and D*, 2005
- Fiscal Impact on Local Government of the Proposed Tobacco Tax Increase, 2004
- *Business Tax Comparison: A Pilot Study of Colorado and Arizona*, 2004
- *Fiscal Cap Style TELs in the States: An Inventory and Evaluation*, 2004
- *The Structure of Government in Colorado: A Ten-Year Update*, 2003
- *The Effectiveness of Tax Amnesty Programs: 1982-2002*, 2003
- *Funding Municipal Government Pre and Post Colorado's TABOR Amendment*, 2002

- *How Colorado Compares*, 1999, 2001, 2002, and 2004 Editions
- *Assessed Valuation and Property Tax Changes in Colorado*, 1999, 2001-2004 Editions
- *Inventory of Statewide TABOR Elections*, 2000

Media Appearances

Colorado Matters, KCFR Radio, Denver, Colorado. 21 minute interview show covering release of state fiscal sustainability study.
 Colorado State of Mind, KRMA Channel 6 Denver, Colorado. One of four panelists invited to discuss the economic outlook for Colorado

KGNU Radio, Boulder, Colorado. Sole guest on half hour interview show discussing state fiscal sustainability

National Public Radio, USA. Interviewed on the design of state tax structures, tax saliency and Colorado's marijuana tax.

Legislative and Executive Briefings and Testimony

Governor Hickenlooper, Colorado, on state fiscal sustainability

Colorado State Legislature on state fiscal sustainability and economic impact of Medicaid expansion

Governor Abercrombie, Hawaii, on fiscal sustainability

Texas State Legislature on tax and expenditure limitations

Selected Professional and Academic Presentations

- 2014 Midwest Regional Public Finance Conference, Wichita, Kansas, *Reassessing Colorado's Long-Term Fiscal Sustainability: 2013 Update*
- *Reassessing Colorado's Long-Term Fiscal Sustainability: 2013 Update* – 30 presentations statewide in 2014
- *Financing Colorado's Future: An Analysis of the Fiscal Sustainability of State Government* – 70 presentations statewide in 2011, 2012 and 2013
- Gubernatorial Briefing – *Financing Colorado's Future*, 2012
- Denver Chamber of Commerce and Colorado Municipal League, Spring 2011, *State Fiscal Sustainability to 2025*
- Vectra Bank Business for Breakfast, Boulder, Colorado, January 2011, 2012, and 2013, *State and Regional Economic Outlook*
- Citizens' Budget Commission of New York and Pew Center for the States and StateLine Conference, Phoenix, Arizona, 2010, *Living with Limits In Colorado: Lessons not Taught in Governing 101*
- Vectra Bank Business for Breakfast, Steamboat Springs and Boulder, Colorado, 2010, *State and Regional Economic Outlook*
- City of Wheat Ridge, Colorado Blue Ribbon Commission on Revenue Sustainability, 2009, *Financing Local Government in Wheat Ridge: A Cautionary Look to the Future*
- Ouray, Colorado Business Roundtable, Colorado Municipal League Annual Meeting, and National League of Cities Regional Conference, 2008, *Financing Local Government in Colorado: A Cautionary Look to the Future*
- Texas State Legislature, May 2008, *TABOR and its Effects on the Economy and Governance in Colorado*
- Western Social Science Association, April, 2008, *The Relationship Between TELs and Tax Reform in the States*
- Colorado City and County Management Association, March, 2007, *Demographic Shifts and Their Effects on Local Government Financing in Colorado*.
- Colorado Association of Realtors annual meeting, February, 2007, *Economic Contribution of Real Estate to the State's Economy*.
- Association of Policy Analysis and Management annual research conference, November, 2006, *Do Fiscal Cap TELS Alter the Frequency and Process of State Tax Changes?*
- International Association of Assessing Officers, October, 2006, and Lincoln Institute of Land Policy, November, 2006, *The Silent Shift: Unnoticed Impacts of Colorado's Gallagher Amendment*

- Testimony at National Academy of Sciences, July, 2006, *An Assessment of the State and Local Tax Section of the US Census Bureau from the perspective of state tax policy user groups*
- American Society for Public Administration Annual Conference, April, 2006, *TABOR: Could it Happen in your State? Lessons from the TEL Movement*
- Jefferson County, Colorado Association of Realtors, March, 2006, *The Impact of the Real Estate Sector on the State and Regional Economy*
- Federation of Tax Administrators Revenue Estimating Conference, October, 2005, *The Effect of TABOR's Ratchet on Colorado's Economic Future*
- Rose Community Foundation Board, August, 2005, *The Effect of TABOR's Ratchet on Colorado's Economic Future*
- Meetings of the National Tax Conference and the Government Research Association, July, 2005, *Constitutional and Statutory Constraints on Fiscal Policy in Colorado*
- Institute for International Education Bosnian Leadership Program, Winter, 2005, *The Structure of Government and Taxation in Colorado*
- Minnesota Taxpayers Association Annual Meeting, February 2005, *The Impact of Direct Democracy on Fiscal Policy-Making in Colorado*
- Center for Colorado Policy Studies, Fall, 2003, *The Role of Research Partnerships Between Universities and Private Non-Profit Research Organizations*
- Colorado Tax Commission, August 2002, *Taxes in Colorado: Perception vs. Reality*
- Colorado Rural Electric Association, Spring 2002, *Taxes in Colorado: Perception vs. Reality*
- National Federation of Independent Business, 1999 Fall Conference, *An Overview of Tax Burden in Colorado as it Compares to States Across the Nation*

Professional Associations and Civic Positions

- Trustee, Government Research Association
- Past Member, Board of Directors – Flatirons Figure Skating Club