

LABOR ECONOMICS 250C, SPRING 2012
PROFESSORS KATE ANTONOVICS AND JULIAN BETTS
COURSE OUTLINE

The course will provide a blend of theoretical labor economics and applied research.

We will cover five broad themes:

I. The Supply Side of the Labor Market

- 1) The Quantity of Labor Supplied***
- 2) The Quality of Labor Supplied: Human Capital***
 - a) The Economics of Education***
 - b) On-the-Job Training and Government Training Programs***

II. Race and Gender Inequality, Discrimination

III. Wage and Employment Dynamics

Professor Betts will teach topic I during weeks 5-6 and Professor Antonovics will teach topics II and III during weeks 1-5.

Requirements for the Course/Schedule

To do well in this course you should have completed the microeconomics and econometrics (A-C) courses. It would be helpful if you have already taken Labor Economics 250A/B, because there we covered many of the empirical methods that we will use in this course. Of these 250A is the most important. If you are unsure, please consult one of the past 250A course syllabi, at <http://www.econ.ucsd.edu/~elib/250A/sylf09.pdf> and discuss with either of us if there are holes in your knowledge of the relevant empirical methods.

You are required to: write your own original term paper, on a subject in labor economics of your choosing; and complete two midterms. In addition, we will ask you to form groups of two and co-present and critique two recent papers in an informal setting; You are also expected to attend and participate actively in all classes.

Here is some advice on finding a topic for your term paper. Perusing recent issues of the Journal of Labor Economics, the Journal of Human Resources, or general interest journals such as the AER, JPE, Econometrica, R.E.Stat etc. may give you some ideas on topics. NBER working papers provide another source. The reading list for this course might also help you. Second, if you already have a general area in mind (immigration, labor supply, economics of education etc.) but not a specific topic, then one of the more difficult challenges is to whittle your interest down to something more specific. The Handbook of Labor Economics provides literature reviews that may help you see which areas are overly well-trodden and which are relatively sparsely researched. A third approach is to flip through the Statistical Abstract of the United States or related government publications such as the Digest of Education Statistics – sometimes seeing what sorts of data the government collects and patterns in data can get your creative juices flowing. Fourth, *talk to both of us about your ideas. This is why we are here!*

Evaluation

5% A paper proposal. Please email both of us a one to three page proposal with a few references by Wednesday of Week 2 (April 11). (Feel free to consult either of us informally before that time.) We offer you three options for this paper. Consider in weeks 1 and 2 which of these options will be most helpful to you as you seek to complete your Ph.D.

1) Come up with a *proposal* for an original empirical paper. In week 2 please submit to us one or two ideas for original papers. We will work with you to decide which to pursue. The final paper should be a *proposal* for an original empirical paper, which states how this paper would contribute to the literature, devises an empirical strategy that is (ideally) based in theory, and discusses data sources that you could use. Ideally, your proposal would be of sufficient quality that you could submit it as a grant proposal to an outside organization. (We do not require submitting a grant application, but encourage you to think along these lines. We will work with you if you decide to follow this route.)

2) Alternatively you could initiate or continue an applied (or a theoretical) project. Some of you may have initiated more empirically (or theoretically) oriented projects in 250A, 250B, 220F, or other graduate courses. You are welcome to continue that work in this course, but you must clear this with us and provide us with the final version you prepared for those classes, along with a clear statement of how you will extend that analysis. Note that if the empirical project is limited in scope it may be conceivable for you to start from scratch, develop a plan, acquire and clean data, and perform the empirical analysis. (This goes beyond option 1 above.) We certainly would welcome this but do talk to us first so that we can help judge whether this sounds feasible over the 10 weeks of quarter.

3) Alternatively write a 10-15 page literature review of a topic in labor economics. This literature review MUST also include thoughtful suggestions for future research. This latter statement is particularly true if you would like to extend a lit review from an earlier course. You would want to come up with a more detailed and focused lit review that builds upon the original paper and which discusses new paper ideas in detail.

35% A final draft of your paper. Due in class on Thursday of week 10 (June 7). Please bring two copies. We also would appreciate receiving a copy by email. There will be no extensions beyond the end of quarter, and papers submitted after June 7 will lose 5 percentage points (out of 35) per day late.

10% A presentation of your paper: A 15-minute presentation of your paper in the last week of class (Tuesday, June 5 and Thursday, June 7). You should present your question, the motivation for your question, the theoretical model and/or econometric technique you will use to answer this question, the data you will use (if you're doing an empirical project), any preliminary results, and how you expect your results to shed light on the question you initially posed. After your presentation, there will be 10 minutes for discussion.

10% Two informal presentations of other research. One will be during Professor Antonovics' section of the course and one during Professor Betts' section of the course.

For Antonovics' section, presentations will take place in class on April 19 and April 24. Please email Kate by Thursday, April 12 with the title of the paper you would like to present. *Given the number of students taking the class, please pick a partner with whom you will co-present the paper.* You can choose from the following papers:

"Assessing Affirmative Action," by Harry Holzer and David Neumark, *Journal of Economic Literature*, 38, September 2000, pp. 483-568. (especially, section 4)

"The Effects of Proposition 209 on College Enrollment and Graduation Rates in California," by Peter Arcidiacono, Esteban Aucejo, Patrick Coate and Joseph Hotz, http://public.econ.duke.edu/~vjh3/working_papers/Prop_209.pdf

"Effort, Race Gaps and Affirmative Action: A Structural Policy Analysis of US College Admissions," by Brent Hickman, http://home.uchicago.edu/~hickmanbr/uploads/AA_Empirical_paper.pdf

"An Economic Analysis of Color-Blind Affirmative Action," by Roland Fryer, Glenn Loury and Tolga Yuret, *Journal of Law, Economics and Organization*, 24(2), pp. 319-355.

"A Remark on Color-Blind Affirmative Action," by Debraj Ray and Rajiv Sethi, *Journal of Public Economic Theory*, 12(3), June 2010, pp. 399-406. (one person only)

"Does Banning Affirmative Action Lower College Student Quality?" by Jimmy Chan and Erik Eyster, *American Economic Review*, 93(3), June 2003, pp. 858-872.

For Betts' section, you will present a recent NBER working paper of your choice (**but in the area of the economics of education**). *Given the large number of students taking 250C, please pick a partner with whom you will co-present the paper.* Please send Julian email by Friday, April 9 with the titles and WP numbers of a few papers you would like to present in class, **and the name of your partner**. Feel free to consult with Professor Betts in advance. Rank order the papers if you select more than two, and we can jointly decide which might be the most appropriate. **We will do the presentations during week 9 at a time to be determined.**

Comment [KA1]: Fill in date here.

Comment [KA2]: Is this right?

One week before the scheduled presentations, please email the paper to all classmates and to either Antonovics or Betts (depending on who's teaching), or give all of us a paper copy. In your presentation, you should plan to present the paper as if it were "yours" and offer constructive criticism and ideas for how you might extend the work. A few pages of handouts would be useful. A rough guideline for the talk might be 15 minutes for presentation of the paper, and a 5-minute discussion of your "referee comments", and 5 minutes for questions. These are meant to be informal presentations, and there may be tea and coffee and/or lunch involved.

20% A midterm on Antonovics' section in class on Thursday, May 3rd.

20% A midterm on Betts's section during finals week.

Textbook:

There is no required text. Students looking for a starting point or background material may wish to use Cahuc P. and Zylberberg A. *Labor Economics* (MIT press, 2004) [C&Z]. For a clear, accessible summary of much of the empirical literature try Ehrenberg, Ronald G. and Robert S. Smith (2006) *Modern Labor Economics, Theory and Public Policy*, (9th edition), HarperCollins, New York. Gud writing iz important. For an entertaining style manual, see Becker, Howard S. (1986) *Writing For Social Scientists*, U. of Chicago.

Office Hours: Julian will have office hours **Thursdays 1:30-2:30**. Any other time is fine as well, although it is best to set up something by email to make sure he is around and not in a meeting. For weeks 1-5 Julian will not hold regular office hours but feel free to set up meetings with him by email during this time. Kate's office hours will be on Wednesdays 2-3:00pm. You're also free to stop by Kate's office at other times, but it's best to email in advance to make sure she's around.

Comment [KA3]: Update if needed.

Reading List: The list is subject to negotiation. The (*) means priority reading. We will also try to give you some guidance as to which papers are the most important.

I. The Supply Side of the Labor Market

I.1) The Quantity of Labor Supplied

* Blundell, Richard and Thomas MaCurdy (1999) "Labor Supply: A Review of Alternative Approaches", in *Handbook of Labor Economics*, Volume 3A, eds O. Ashenfelter and D. Card, Amsterdam: Elsevier Science.

Killingsworth, Mark (1983), *Labor Supply*, (Cambridge: Cambridge University Press) Chapters 1 and 2.

* Ben-Porath, Yoram (1973), "Labor Force Participation Rates and the Supply of Labor", *Journal of Political Economy* (May/June).

i) Static Labor Supply -- Theory and Estimation

* Heckman, James (1974), "Shadow Prices, Market Wages and Labor Supply", *Econometrica* (July).

* Heckman, James (1979), "Sample Selection Bias as a Specification Error With an Application to the Estimation of Labor Supply Functions", in James Smith (Ed.) *Female Labor Supply*, (Princeton: Princeton University Press).

Moffitt, Robert (1984), "The Estimation of a Joint Wage-Hours Labor Supply Model", *Journal of Labor Economics*, (October).

Mroz, Thomas (1987), "The Sensitivity of an Empirical Model of Married Women's Hours of Work to Economic and Statistical Assumptions", *Econometrica*, (July).

ii) Dynamic Labor Supply -- Theory and Basic Estimation

Altonji, Joseph (1986), "Intertemporal Substitution in Labor Supply: Evidence from Micro Data", *Journal of Political Economy*, (June), Supplement.

Camerer C, Babcock L, Loewenstein G, et al., (1997), "Labor supply of New York City cabdrivers: One day at a time," *Quarterly Journal of Economics*, 112 (2): 407-441 May.

Carrington, William J., (1996) "The Alaskan Labor Market during the Pipeline Era," *The Journal of Political Economy*, Vol. 104, No. 1. (Feb.), pp. 186-218.

* Heckman, James (1974), "Life Cycle Consumption and Labor Supply: An Explanation of the Relationship between Income and Consumption Over the Life Cycle", *American Economic Review* (March).

Heckman, James and Thomas MaCurdy (1980), "A Life Cycle Model of Female Labor Supply", *Review of Economic Studies*, (January).

Lucas. Robert E. and Leonard Rapping (1969), "Real Wages, Employment, and Inflation", *Journal of Political Economy*, (October).

* MaCurdy, Thomas (1981), "An Empirical Model of Labor Supply in a Life Cycle Setting", *Journal of Political Economy* (December).

* Oettinger, Gerald S (1999), "An empirical analysis of the daily labor supply of stadium vendors," *Journal of Political Economy* 107 (2): 360-392 April.

Connolly, Maria (2008), "Here Comes the Rain Again: Weather and the Intertemporal Substitution of Leisure," *Journal of Labor Economics*, 26 (1), January 73-100.

iii) Using Non-linear Budget Constraints Induced by Taxes and Subsidies to

Estimate Labor Supply Responses

*Richard Blundell, Alan Duncan, and Costas Meghir (1998), "Estimating Labor Supply Responses Using Tax Reforms," *Econometrica*, July, 827-61.

* Imbens, Guido W., Donald B. Rubin and Bruce I. Sacerdote (2001), "Estimating The Effect Of Unearned Income On Labor Earnings, Savings, And Consumption: Evidence From A Survey Of Lottery Players," *American Economic Review*, 2001, v91(4,Sep), 778-794.

Ziliak, James and Thomas Kneisner (1999), "Estimating Life Cycle Labor Supply Tax Effects," *Journal of Political Economy*, April, 326-59.

Eissa, Nada and Jeffrey Liebman (1996), "Labor supply response to the earned income tax credit" *Quarterly Journal of Economic*, May (111:2).

Moffitt, Robert (1986), "The Econometrics of Piecewise-Linear Budget Constraints," *Journal of Business and Economic Statistics*, 4:3, 317-328.

iv) Pensions and Retirement

Coile, Courtney and Jonathan Gruber (2000), "Social Security and Retirement," NBER Working Paper No. 7830, August.

Samwick, Andrew (1998) "New Evidence on Pensions, Social Security, and the Timing of Retirement," *Journal of Public Economics*, November 1998, 207-36.

Gruber, Jonathan and Peter Orszag (2000), "Does the Social Security Earnings Test Affect Labor Supply and Benefits Receipt?" NBER Working Paper No. 7923, September.

v) Health Insurance and Labor Supply

Madrian, Brigitte (1994), "Employment-Based Health Insurance and Job Mobility: Is There Evidence of Job Lock?" *Quarterly Journal of Economics*, February, 27-54.

Gruber, Jonathan and Madrian, Brigitte C (1997) "Employment separation and health insurance coverage", *Journal of Public Economics*; December.

I will distribute notes on these topics to supplement what you may have studied in public economics. We may discuss briefly in class, but this will not be on the midterm.

I.2) The Quality of Labor Supplied: Human Capital

a) The Economics of Education

i) Human Capital Theory

Becker, Gary (1975), **Human Capital**, 2nd edition, Chicago: University of Chicago Press.

* Ben-Porath, Y, "The Production of Human Capital and the Life Cycle of Earnings," *Journal of Political Economy*, August 1967, pp. 352-65.

ii) Econometric Techniques For Estimating The Returns To Education

a) Standard Approach

b) Heckman Selectivity Correction

Mincer, Jacob (1974), *Schooling, Experience and Earnings*, New York: Columbia University Press for NBER.

* Griliches, Zvi (1977), "Estimating the Returns to Schooling: Some Econometric Problems", *Econometrica*, **45**, Jan. pp. 1-22.

* Heckman, James (1979), "Sample Selection Bias as a Specification Error", *Econometrica*, **47**, pp. 153-161.

* Willis, R.J. and S. Rosen (1979), "Education and Self-Selection", *Journal of Political Economy*, **87**, (Supplement, October), pp. S7-S36.

c) IV Methods

* Angrist, Joshua D. and Alan B. Krueger (1991), "Does Compulsory School Attendance Affect Schooling and Earnings?", *Quarterly Journal of Economics*, **56**, #4, pp. 979-1014.

Angrist, Joshua D. and Alan B. Krueger (1991), "The Effect of Age at School Entry on Educational Attainment: An Application of Instrumental Variables with Moments from Two Samples", *Journal of the American Statistical Association*, **87**, #418, June, pp. 328-336.

Angrist, Joshua D. and Alan B. Krueger (1994), "Why do World War II Veterans Earn More than Nonveterans?", *Journal of Labor Economics*, **12**, #1, Jan., pp. 74-97.

* Ashenfelter, Orley and Alan Krueger (1994), "Estimates of the Economic Return to Schooling from a New Sample of Twins", *American Economic Review*, December.

* Bound, John, David A. Jaeger and Regina M. Baker (1995), "The Cure Can be Worse than the Disease: A Cautionary Tale Regarding Instrumental Variables", *Journal of the American Statistical Association*, June.

Card, David (1999), "The Causal Effect of Education on Earnings", in Orley Ashenfelter and David Card (eds.), *Handbook of Labor Economics Volume 3A*.

Card, David (1993), "Using Geographic Variation in College Proximity to Estimate the Return to Schooling", NBER Working Paper 4483. Published in 1995 in *Aspects of Labour Market Behaviour: Essays in Honour of John Vanderkamp*, Louis Christofides et al. (eds.), Toronto: University of Toronto Press.

Kane, Thomas J. and Cecilia E. Rouse (1995), "Labor Market Returns to Two- and Four-Year College", *American Economic Review*, June.

Staiger, Douglas and James H. Stock (1997), "Instrumental variables regression with weak instruments", *Econometrica* v65, n3 (May 1997).

Harmon, Colm and Ian Walker (1995), "Estimates of the Economic Return to Schooling for the United Kingdom", *American Economic Review*:1278-1286.

d) Fixed Effect Methods

Altonji, Joseph and Thomas Dunn, (1996), "The Effects of Family Characteristics on the Return to Education", *Review of Economics and Statistics*, (November).

Angrist, Joshua and Whitney Newey (1991), "Over-identification Tests in Earnings Functions with Fixed Effects", *Journal of Business and Economic Statistics* (July).

Ashenfelter, Orley and David Zimmerman (1997), "Estimates of the Returns to Schooling from Sibling Data: Fathers, Sons and Brothers", *Review of Economics & Statistics* v79, n1 (Feb.).

* Ashenfelter, Orley and Alan Krueger (1994), "Estimates of the Economic Return to Schooling from a New Sample of Twins", *American Economic Review* (December). (Note: This paper uses both instrumental variables and fixed effects.)

* Light, Audrey (1995), "The Effects of Interrupted Schooling on Wages", *Journal of Human Resources* (Summer).

iii) Human Capital Versus Signaling

a) A Review of the Signaling Model

* Spence, Michael (1973), "Job Market Signalling", *Quarterly Journal of Economics*.

Stiglitz, Joseph (1975), "The Theory of Screening, Education, and the Distribution of Income", *American Economic Review*.

b) Empirical Evidence

Altonji, Joseph (1995), "The Effects of High School Curriculum on Education and Labor Market Outcomes", *Journal of Human Resources*, (Summer).

Altonji, Joseph and Charles R. Pierret (2001), "Employer learning and statistical discrimination", *Quarterly Journal of Economics*, Feb. 116:1 313-350.

* Bedard, Kelly (2001), "Human capital versus signaling models: University access and high school dropouts", *Journal of Political Economy*, Aug., (109:4), 749-775.

Farber, Henry S. and Robert Gibbons (1995), "Learning and Wage Dynamics", *Quarterly Journal of Economics* (November).

Gibbons, Robert and Lawrence F. Katz (1991), "Layoffs and Lemons", *Journal of Labor Economics*, **9**, #4, pp. 351-380.

* Lang, Kevin and David Kropp (1986), "Human Capital versus Sorting: The Effects of Compulsory Attendance Laws", *Quarterly Journal of Economics*, **101**, #3, pp. 609-624.

Rose, Heather and Julian R. Betts (2004), "The Effect of High School Courses on Earnings", *Review of Economics and Statistics*, May (**86**:2), pp. 497-513.

Weiss, Andrew (1988), "High School Graduation, Performance, and Wages", *Journal of Political Economy* (**96**:4).

iv) The Social Returns to Education and Education Externalities

Currie, J. and Moretti, E. "Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings." *Quarterly Journal of Economics*, 2003, 118(4), pp. 1495-532.

Lochner, L. and Moretti, E. "The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-Reports." *American Economic Review*, 2004, 94(1), pp. 155-89.

Milligan, K.; Moretti, E. and Oreopoulos, P. "Does Education Improve Citizenship? Evidence from the United States and the United Kingdom." *Journal Of Public Economics*, 2004, 88(9-10), pp. 1667-95.

* Moretti, Enrico, (2003) "Human Capital Externalities in Cities", available at <http://www.econ.berkeley.edu/~moretti/papers.html>.

Moretti, E. "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-Sectional Data." *Journal Of Econometrics*, 2004a, 121(1-2), pp. 175-212.

_____. "Workers' Education, Spillovers, and Productivity: Evidence from Plant-Level Production Functions." *American Economic Review*, 2004b, 94(3), pp. 656-90.

Rauch, J. E. "Productivity Gains from Geographic Concentration of Human-Capital - Evidence from the Cities." *Journal of Urban Economics*, 1993, 34(3), pp. 380-400.

v) The Determinants Of School Quality

a) Literature Review on School Inputs and Student Outcomes

Basic Literature Review

Coleman, James et al. (1966), "*Equality of Educational Opportunity*", Washington: Government Printing Office.

* Hanushek, Eric A. (1986), "Production and Efficiency in Public Schools", *Journal of Economic Literature*, **24**, #3, pp. 1141-1177.

See also the articles in Burtless, Gary (Ed.) (1996), *"Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success."* (Washington, DC: Brookings Institution).

More Recent Evidence

* Angrist, Joshua D., and Victor Lavy, (1999) , "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement," *Quarterly-Journal-of-Economics*. May, 114(2): 533-75

* Betts, Julian R., (1995), "Does School Quality Matter? Evidence from the National Longitudinal Survey of Youth", *Review of Economics and Statistics*.

* Betts, Julian R., (1996), "Is There a Link Between School Inputs and Earnings? Fresh Scrutiny of an Old Literature", in Gary Burtless (Ed.), *"Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success."* (Washington, DC: The Brookings Institution).

Betts, Julian R. (1996), "Do School Resources Matter Only for Older Workers?", *Review of Economics and Statistics* (**78**:4), pp. 638-652.

Betts, Julian R. (2001), "The Impact of School Resources on Women's Earnings and Educational Attainment: Findings from the National Longitudinal Survey of Young Women", *Journal of Labor Economics*, (**19**:3), pp. 635-657.

Betts, Julian R. and Jamie L. Shkolnik (2000), "The Behavioral Effects of Variations in Class Size: The Case of Math Teachers", *Educational Evaluation and Policy Analysis*, Summer, (**20**:2), pp. 193-213.

Betts, Julian R., Andrew Zau and Lorien Rice (2003), **Determinants of Student Achievement: New Evidence from San Diego**, San Francisco: Public Policy Institute of California.

Bishop, J.H., (1989), "Is the Test Score Decline Responsible for the Productivity Growth Decline?", *American Economic Review*, **79**, pp. 178-197.

* Card, David and Alan B. Krueger (1992a), "Does School Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States", *Journal of Political Economy*, **100**, pp. 1-40.

Card, David and Alan B. Krueger (1992b), "School Quality and Black-White Relative Earnings: A Direct Assessment", *Quarterly Journal of Economics*, **57**, #1, pp. 151-200.

Card, David and Alan B. Krueger (1996), "School Resources and Student Outcomes: An Overview of The Literature and New Evidence from North and South Carolina", *Journal Of Economic Perspectives*, (**10**:4), (Fall).

Grogger, J., (1996), "Does School Quality Explain the Recent Black/White Wage Trend?", *Journal of Labor Economics* (April).

Hanushek, Eric A. and Lori L. Taylor (1990), "Alternative Assessments of the Performance of Schools: Measurement of State Variations in Achievement", *Journal of Human Resources*, **25**, #2, pp. 179-201.

* Heckman, James J, Anne S. Layne-Farrar and Petra E. Todd (1996), "Does Measured School Quality Really Matter?", in Gary Burtless (Ed.), *"Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success."* (Washington, DC: The Brookings Institution).

Hoxby, Caroline M. (2000), "The Effects of Class Size on Student Achievement: New Evidence from Population Variation," *Quarterly Journal of Economics*, (November), 115(4): 1239-85.

Lazear, Edward (2001), "Educational Production", *Quarterly Journal of Economics*, August (116:3). This paper is also available as NBER Working Paper 7349.

See also the November 1996 issue of *Review of Economics and Statistics* for a Symposium on School Quality and Educational Outcomes.

Krueger, Alan B. (1999), "Experimental Estimates of Education Production Functions", *Quarterly Journal of Economics* (May):497-532.

b) The Labor Market for Teachers

Boyd, D.; Lankford, H.; Loeb, S. and Wyckoff, J. "The Draw of Home: How Teachers' Preferences for Proximity Disadvantage Urban Schools." *Journal of Policy Analysis And Management*, 2005a, 24(1), pp. 113-32.

_____. "Explaining the Short Careers of High-Achieving Teachers in Schools with Low-Performing Students." *American Economic Review*, 2005b, 95(2), pp. 166-71.

Lankford, H.; Loeb, S. and Wyckoff, J. "Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis." *Educational Evaluation And Policy Analysis*, 2002, 24(1), pp. 37-62.

Hanushek, Eric A., John F. Kain, and Steven G. Rivkin (2005), "Teachers, Schools, and Academic Achievement" *Econometrica*, March, 73(2): 417-58.
An earlier version is available as National Bureau of Economic Research Working Paper 6691.

Hoxby, Caroline M. (1996), "How Teachers' Unions Affect Education Production," *Quarterly Journal of Economics*, 111:3.

Loeb, Susanna and Marianne E. Page (2000), "Examining the Link between Teacher Wages and Student Outcomes: The Importance of Alternative Labor Market Opportunities and Non-pecuniary Variation," *Review of Economics and Statistics*, August, 82(3): 393-408.

Koedel, Cory and Julian Betts, "Value-Added to What? How a Ceiling in the Testing Instrument Influences Value-Added Estimation", *Education Finance and Policy*, (5:1), 54-81.

Koedel, Cory and Julian Betts (2011), "Does Student Sorting Invalidate Value-Added Models of Teacher Effectiveness? An Extended Analysis of the Rothstein Critique," *Education Finance and Policy*, Winter, (6:1), 18-42.

Jacob, Brian A. and Lars Lefgren (2008), "Can Principals Identify Effective Teachers? Evidence on Subjective Performance Evaluation in Education," *Journal of Labor Economics*, 26(1) January, 101-136.

Rockoff, Jonah E., Brian A. Jacob, Thomas J. Kane, and Douglas O. Staiger (2011), Can You Recognize an Effective Teacher When You Recruit One? *Education Finance and Policy* Winter, (6:1), 43-74.

Rothstein, Jesse (2009). "Student Sorting and Bias in Value-Added Estimation: Selection on Observables and Unobservables," *Education Finance and Policy*, 4(4): 538-572.

c) Peer Groups and Ability Grouping

Angrist, Joshua D. and Kevin Lang (2004), "How Important are Classroom Peer Effects? Evidence from Boston's Metco Program," *American Economic Review*. December, 94(5): 1613-34.
An earlier version is available as National Bureau of Economic Research Working Paper 9263.

Argys, L. M., Rees, D. I., Brewer, D. J., 1996. Detracking America's Schools: Equity at Zero Cost? *Journal of Policy Analysis and Management* 15, (4), 623-645.

Betts, Julian R. (2011), (2011), "The Economics of Tracking in Education", in Hanushek, Eric A., Stephen Machin and Ludger Woessmann (Eds.), **Handbook of the Economics Of Education**, Volume 3, Amsterdam: North Holland, pp. 341-381.

Betts, Julian R. and Jamie L. Shkolnik (2000), "The Effects of Ability Grouping on Student Math Achievement and Resource Allocation in Secondary Schools", *Economics of Education Review*, (19:1), pp. 1-15.

Betts, Julian R. and Andrew Zau (2003), "Peer Groups and Academic Achievement: Panel Evidence from Administrative Data," manuscript, Department of Economics, UCSD.

Hanushek, Eric A., John F. Kain, Jacob M. Markman and Steven G. Rivkin (2001), "Does Peer Ability Affect Student Achievement?" (An earlier version is available as National Bureau of Economic Research Working Paper 8502.)

Hoxby, Caroline M., "Peer Effects in the Classroom: Learning from Gender and Race Variation," NBER Working Paper No. 7867, 2001.

Lazear, Edward (2001), "Educational Production", *Quarterly Journal of Economics*, August (116:3). This paper is also available as NBER Working Paper 7349.
(This paper has as much to say about peers as it does about class size.)

Vigdor, Jacob L. and Thomas S. Nechyba (2004), "Peer Effects in North Carolina Public Schools." Kennedy School of Government Program on Education Policy and Governance Research Paper #04-20, July 2004.

d) School Choice and School Competition

* Betts, Julian R., Lorien A. Rice, Andrew C. Zau, Y. Emily Tang, and Cory R. Koedel, *Does School Choice Work? Effects on Student Integration and Achievement*, San Francisco: Public Policy Institute of California. Available at www.ppic.org.

Cullen, J. B.; Jacob, B. A. and Levitt, S. D. "The Impact of School Choice on Student Outcomes: An Analysis of the Chicago Public Schools." *Journal Of Public Economics*, 2005, 89(5-6), pp. 729-60. (See also NBER Working Paper 7888.)

* Cullen, Julie Berry; Jacob, Brian A; Levitt, Steven, (2006) "The Effect of School Choice on Participants: Evidence from Randomized Lotteries," *Econometrica*, September, 74(5): 1191-1230.

Epple, Dennis and Romano, Richard (1998), "Competition Between Private and Public Schools, Vouchers, And Peer-Group Effects," *American Economic Review* 88, 33-62.

Hoxby, Caroline M. (1998), "What Do America's 'Traditional' Forms of School Choice Teach Us about School Choice Reforms?", (March) *Economic Policy Review*, downloadable from www.ny.frb.org.

* Hoxby, Caroline M. (2000), "Does Competition among Public Schools Benefit Students and Taxpayers?", *American Economic Review*, December.

Hoxby, Caroline M. "School Choice and School Productivity (Or, Could School Choice be a Rising Tide that Lifts All Boats," in C. Hoxby, ed. *The Economics of School Choice*, Chicago: University of Chicago Press, 2003.

Hsieh, C. T. and Urquiola, M. (2003), "When Schools Compete, How Do They Compete? An Assessment of Chile's Nationwide School Voucher Program." *Journal Of Economic History*, 63(2), pp. 558-58. (See also NBER Working Paper 10008.)

Hsieh, C. T. and Urquiola, M. "The Effects of Generalized School Choice on Achievement and Stratification: Evidence From Chile's Voucher Program." *Journal of Public Economics* 90 pp. 1477–1503.

Krueger, A. and Zhu, P. (2003), "Another look at the New York City school voucher experiment, NBER Working Paper 9418, National Bureau of Economic Research.

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