Incorporating Racial Justice Topics into an Econometrics Course▫

1 Motivation

Racial justice has been at the forefront of the public discourse for a decade since the shooting of a Black teenager Trayvor Martin (Hajela 2022) by a private citizen in 2012 and the subsequent establishment of the Black Lives Matter movement (*Black Lives Matter* 2022) with the U.S. nationwide protests against racial injustices spreading around the world (Gunia, Nugent, Moon, Shah, and Haynes 2021). Racism has been pointed out by policy-makers such as Raphael Bostic, the Federal Reserve Bank of Atlanta President, as harmful for economic growth (Bowman 2020), and economists in academia have been coming to the realization that racial justice is not adequately addressed in the undergraduate economics instruction, sparking e orts to incorporate topics related to race into economics courses. However, topics related to race remain rare in economics courses: Asarta, Chambers, and Harter (2021) nd in a 2020 survey of instructors teaching introductory economics courses at U.S. institutions that activities and lessons addressing diversity and inclusion were almost never used in classrooms,[1] con rming results from previous studies such as a 2010 survey by Watts and Schaur (2011).

This paper shows how to incorporate racial justice topics into an econometrics course.[2] Students select journal articles about race in the economy (for example, articles about racism in the housing and credit markets), present the articles to the class and lead a discussion

provides instructions on how to incorporate the topic of racial disparities into an introductory macroeconomics course using data analysis activities, and the website Diversifying Economic

the student-led discussions by using econometrics as the foundation for the discussions.

Fifth, the paper contributes to the literature on teaching econometrics. This literature includes papers on teaching speci c topics;[5] implementing pedagogies such as the ipped classroom pedagogy in R. Becker and Proud (2018) and invention activities in McKee and Orlov (2021); ful lling the capstone experience in Klein (2013) and Conaway, Clark, Arias, and Folk (2018); and addressing the disconnect between what students learn in econometrics and what they need to know after graduating in their jobs in Kassens (2019) and how empirical econometric research is done in Angrist and Pischke (2017). This paper contributes to this literature by showing that the econometrics course can be focused on a particular topic, such as racial justice topics, using the student-led reading list.[6]

The paper proceeds as follows. Next section presents information about the course and grading. The following section provides background for the student-led readings focused on racial justice. Resource requirements, bene ts, and additional suggestions for implementa-

2 Course Information and Grading

This econometrics course was taught in the spring of 2021 at a four-year, liberal arts college. The college uses 13-week semesters. The course is capped at 18 students. The course is a three-credit, elective course that meets twice a week for 80 minutes during a 13-week semester. It is focused on the theory behind econometric techniques and application of the techniques to economic data. There are ve prerequisites for this course: introduction to microeconomics, introduction to macroeconomics, calculus I, statistics, and either intermediate microeconomics or intermediate macroeconomics. Typically, students are in their third year, although there can also be second-year and fourth-year students. The econometrics course uses a standard econometrics textbook and covers topics standardly taught in econometrics courses. It begins with the regression topic followed by topics such as functional forms, heteroskedasticity, and panel data. The Stata software is used for processing data and estimating econometrics models.

Grading consists of four homework assignments, two projects where students replicate original research using the Stata software, midterm exam, nal exam, and participation during in-class Stata activities. These components comprise 20%, 20%, 15%, 20%, and 10% of the course grade, respectively. The remaining 15% of the grade consists of 10% for the presentations of the journal articles selected by students about racial justice topics and 5% for participation during the journal article discussions.

Table 1 shows the list of fascinating articles selected by the students. Students can choose articles from any economics field, depending on their interests. The articles are from a variety of fields. Urban economics is the most commonly selected field with three articles. Gabriel and Spring (2019) studies migration decisions of couples with children and finds that mixed-race couples are likelier to select higher-diversity neighborhoods. Harris and Yelowitz (2018) studies the impact of racial climate on homeownership and finds that worse racial climate leads to lower Black homeownership. Shertzer, Twinam, and Walsh (2016) studies how racial and ethnic composition of neighborhoods in Chicago in the 1920s affected local zoning and finds that neighborhoods with higher percentages of Southern born Blacks or first-generation immigrants are likelier to be designated for industrial use. One article was from financial economics: Asiedu, Freeman, and Nti-Addae (2012) analyzes the effect of applicant's race on denial of loans for small businesses and finds that the loan denial is higher for minority-owned firms with an especially high denial for Black firms. One article was from experimental economics: Edelman, Luca, and Svirsky (2017) conducts an experiment on the Airbnb accommodation rental website and concludes that guests with African American names are less likely accepted for accommodation by hosts. Two articles were from sports economics: Price and Wolfers (2010) finds that basketball players are given more personal fouls when the game referees are of the opposite race, but Hamrick and Rasp (2015) does not find strong evidence of umpires discriminating based on race in baseball.

One week before the article is presented during the class meeting, the student(s) who

like. Third, while the instructions in Table A1 require that the article not be a reading from another course or the econometrics replication projects to encourage students to read new articles, this requirement could be eliminated if the instructor wants students to use readings that they have previously read. Fourth, if the instructor prefers approving the journal article selection, an additional step could be added to the instructions requiring the students to obtain the instructor's approval. The instructor's approval would also allow for a low-stakes intervention to ensure that the article is appropriate before the article is posted.

Table 1: Journal Articles Selected by Students

Author (Year)	Title	Field
Asiedu et al. (2012)	Access to Credit by Small Businesses: How Relevant Are Race, Ethnicity, and Gender?	Financial Economics
Edelman et al. (2017)	Racial Discrimination in the Sharing Economy: Evidence from a Field Experiment	Experimental Economics
Gabriel and Spring (2019)	Neighborhood Diversity, Neighborhood Affluence: An Analysis of the Neighborhood Destination Choices of Mixed-Race Couples With Children	Urban Economics
Hamrick and Rasp (2015)	The Connection Between Race and Called Strikes and Balls	Sports Economics
Harris and Yelowitz (2018)	Racial Climate and Homeownership	Urban Economics
Price and Wolfers (2010)	Racial Discrimination Among NBA Referees	Sports Economics
Shertzer et al. (2016)	Race, Ethnicity, and Discriminatory Zoning	Urban Economics

will be presenting post the selected article on the course website. They also post questions about this article. The other students who will not be presenting the article are responsible for reading the article and preparing answers to the questions.[9] Table 2 shows questions for the Gabriel and Spring (2019) journal article as an example. The questions include general questions about main research question and previous research (questions 1 and 2), data questions (questions 3 through 5 about the sample period, sample size, and variables), models (questions 6 through 9), tables (questions 10 through 14), and results (questions 15 and 16). In the questions about econometrics, students are required to ask questions about topics that we have already covered in our class meetings, such as question 6 about why the ordinary least squares (OLS) regression is not appropriate for estimating the equation in this article. In addition, students are required to ask a question about an econometrics topic that we have not covered in our class meetings yet, such as questions 7 and 8 about the multinomial logit. These questions are usually the most challenging ones for the presenting students to write and for the non-presenting students to answer. To foster independent

[9]The instructor does not collect the answers from the non-presenting students; however, the instructor could choose to collect them and grade them as an additional assignment.

Table 2: Questions for the Gabriel and Spring (2019) Journal Article

#	Question
1	What is the main research question?
2	What did the previous research conclude about this question?
3	What were the observation years for this research?
4	What was the sample size?
5	What variables were used for this research?
6	Why cannot traditional regression methods (OLS) work for this research?
7	What are multinomial logit models?
8	How many coe cients are being used in the logistic regression equation?
9	How many equations are there and what do they estimate?
10	What does Table 1 represent?
11	Explain Table 2 including what the numbers mean.
12	Explain Table 3 including what the numbers mean.
13	Explain Table 4 including what the models represent.
14	Explain Table 5 including what the models represent.
15	What is the most signi cant explanation for the result?
16	Could there be other explanations for the result?

learning of econometric models not covered in our class meetings, which is a skill useful for other courses, graduate school as well as careers, the students are encouraged to look up information about the more advanced econometrics on the Internet and learn it to the best of their abilities. Naturally, students presenting early in the semester might select articles with more basic econometrics such as the ordinary least squares regression, whereas students presenting later in the semester might select articles with more advanced econometrics such as panel data econometrics, which underscores the cumulative learning that students experience during the semester.

The presenting student(s) prepare a PowerPoint presentation that includes the questions about the article. They then present the article to the class and lead a discussion about it. Typically, the presenting students will start the presentation by brie y summarizing the topic of the article and explaining why they selected this particular article. They will then pose the rst question that they had posted on the course website and call on the non-presenting

students to answer it. If the question is straightforward, for example, question 3 shown in Table 2 about the observation years, it is usually su cient for one non-presenting student to answer the question. Such questions will take a minute or less for presenting students to ask and non-presenting students to answer. If the question is more complex, for example, question 16 shown in Table 2 about other possible explanations for the result, multiple non-presenting students might o er their answers. Such questions might take several minutes to ask and answer. The presenting student(s) lead this discussion, o ering their own answers since they are most familiar with the article.[10] This process continues until all questions have been discussed. Typically, this takes approximately 25 minutes, leaving plenty of time in the 80-minute class meeting for the instructor to cover other material. The presenting students receive a grade for their presentation and the non-presenting students receive a grade for their participation in the discussion, which provides motivation for the non-presenting students to participate in the discussion. The instructor can occasionally engage in the discussion, for example, by pointing out econometrics concepts from the journal article that are relevant for the course material.[11]

The presentations open opportunities to discuss issues related to race such as how race is measured in the data, whether race plays a role in explaining the dependent variable, and shortcomings of the research. Students can bring knowledge from other courses that they

[10] As Table 2 shows, answering questions does not require knowledge of the U.S. history. A vast majority of the questions (questions 1 through 15) can be answered by reading the article or looking up information about econometric estimation methods in the textbook or on the Internet. The exception is question 16 that is more open-ended but even this question can be answered by, for example, discussing possible omitted variables. Therefore, the discussion is accessible to not only domestic but also international students.

[11] If the instructor prefers providing more guidance on how to conduct the presentations, the instructor could conduct the rst presentation to set an example of what the PowerPoint slides should look like and how the related discussion should be organized. In addition, the instructor could require that the PowerPoint slides be submitted to the instructor ahead of time to allow for another low-stakes intervention, ensuring that the slides are appropriate before the presentation takes place.

have taken, such as courses that include models of discrimination. Very often the liveliest

Grading time is also minimal. Grading of the presentations by the presenting students can be made e cient by a grading rubric as recommended in McGoldrick and Peterson (2013). Table 3 shows the grading rubric that was used in this course. Grading of the participation by the non-presenting students can be done using a simple grading rubric, such as 0 and 1 where 0 is no participation and 1 is participation; or 0, 1, and 2 where 0 is no participation, 1 is limited participation, and 2 is excellent participation. Grading of both the presenting and non-presenting students can then be accomplished during the presentations, resulting in no additional grading time outside of the class meeting.

Perhaps the biggest resource requirement has to do with dedicating class time to the journal article presentations. The econometrics course is already packed with topics that instructors want to cover. Instructors might therefore ask themselves whether introducing the student-led readings focused on racial justice is feasible. For example, if there were seven presentations of 25 minutes, the presentations would take up 175 minutes, which translates into approximately one week of class time, assuming that there are two 80-minute classes in a week. The following subsection discusses the bene ts of the student-led readings and argues that the bene ts are worth the class time.

Since the COVID-19 pandemic has led many institutions to utilize virtual learning, feasibility of the student-led readings about racial justice in the virtual format deserves a special mention. This course was taught in person but the approach can be implemented virtually. Any application, such as the commonly used Webex and Zoom, that allows for screen-sharing and involvement by participants makes it possible for the presenting students to share their slides and discuss the article with the non-presenting students.

Since the student-led readings about racial justice were implemented in a small class,

Table 3: Grading Rubric for the Student-Led Journal Article Presentations

	Percent
The article is from a peer-reviewed economics journal.	5
The article and questions are posted on our course website discussion board at least one week before the presentation.	10
Presenters introduced themselves and their topic.	2.5
Presenters explained why the article is interesting/relevant.	2.5
The article is sufficiently long/difficult and includes appropriate econometrics topics.	15
Enough questions are posted for everyone to have an opportunity to participate in the discussion.	10
Questions about data/econometrics are included.	20
Presentation is well-structured.	5
Presentation is interesting.	5
PowerPoint slides are clear. (There is not too much text, font size is appropriate, colors do not obscure the text, etc.)	7.5
Presenters lead a productive discussion during the class meeting.	10
Transition between presenters is smooth.	2.5
Presentation has good timing. (It is not too short or long).	5
Total	100

implementation in larger classes should also be discussed. If the number of students in the class does not allow for teams of two students, students can present in teams of, for example, three students, to keep the number of presentations manageable. In a large class, it is possible that some non-presenting students would not have an opportunity to answer a question asked by the presenting students. To ensure that the non-presenting students did read the article and answer the questions, the instructor could require students to submit their answers before class. If the size of the class did not allow for students to present in teams at all, the student-led readings about racial justice topics could still be implemented as an assignment completed fully outside of the class meetings. For example, students could still select the article, share it with other students and prepare questions to be answered. The other students could submit answers to the questions as a homework assignment. The benefits of the student-led readings about racial justice described in the next subsection would still maintain.

4.2 Bene ts

This subsection discusses the bene ts of the student-led readings focused on racial justice. The advantage of letting students select the journal articles is that they select articles from elds that interest them rather than elds preferred by the instructor, which seems to motivate the students to be more engaged in the learning process. While the student-led readings enhance a variety of important skills such as critical thinking, analytical reasoning, and presentation skills,[12] the main bene ts are bringing racial justice topics into the course while strengthening econometrics skills.

The econometrics skills are strengthened both for the presenting and non-presenting students. All students have to carefully read the articles to ask or answer questions about econometrics topics that we have discussed in our class meetings. This reinforces learning the material covered in our class meetings. For example, every presentation discusses interpretation of coe cients and statistical signi cance, so the instructor does not have to spent time reviewing these topics. The students

with which the individuals might identify. When discussing journal articles where race plays a role in explaining outcomes in the housing market, students might discuss redlining, a discriminatory practice of nancial institutions not providing mortgages to individuals living in particular neighborhoods. In addition, in any article the students can discuss shortcomings of the research, such as other variables that could be included in the model to further explain the dependent variable or extending the research to other sample periods or locations. Because the course enrolls more advanced students with stronger technical skills than, for example, introductory courses, the students can study racial justice topics on a deeper level using evidence-based approach where causal e ects are clearer and more convincing than in discussions about race that are not evidence-based.

This econometrics course has seven student learning outcomes: 1) understand the theory behind basic econometric techniques used in empirical economics research, 2) understand how these techniques are used to answer research questions, 3) know how to choose the appropriate technique, 4) estimate econometric models using Stata, 5) critically interpret estimates from these models, 6) complete projects using economic data and econometrics, and 7) gain a better understanding of economics journal articles. While the student-led readings support all the student learning outcomes, they are particularly useful for achieving outcomes 2), 3), 5), and 7).

to contemplate econometrics in an antiracist way. This subsection provides examples of such questions about four aspects of the journal articles that students are likely to encounter: data measurement, data collection, model speci cation, and interpretation of results.

In the discussion of data measurement, students could consider how race is measured. What elements are omitted when race is measured as a categorical variable? What do the race categories used in the article that is being discussed capture and what do they not capture? In the selected journal article, does the race variable capture individuals' biological di erences or their di erences in social experiences?

Regarding data collection, students could be encouraged to think about how data was collected in the journal article that is being discussed. Was data collected in an ethical and anti-racist way? Were some racial or ethnic groups undercounted in the data? How could econometric models account for undercounting of some racial or ethnic groups?

Related to model speci cation, student could consider whether race was added to the econometric model as an independent variable without an explanation of why race would cause di erences in the dependent variable. If demographic variables in the journal article are limited to a race variable, students could be guided to think about intersectionality. For example, following Apodaca (2009), introducing interaction terms into the econometric model where the race variable is interacted with a gender variable allows the researcher to distinguish between race-gender groups and thus embrace intersectionality and reduce essentialization. In another approach, intersectionality theorists such as Sprague (2016) and Scott and Siltanen (2017) emphasize the importance of estimating separate models for di erent demographic groups, rather than, for example, including indicator variables or interaction terms for measures such as race or gender. These authors argue that separate

models allow investigating how the mix of explanatory variables changes across groups and comparing the models' explanatory power across the intersections.

In interpretation of results, students could discuss framing of the results. If indicator variables and interaction terms are used to measure race and gender, students could discuss which race-gender group is used as the reference group. Would the results be interpreted di erently if low-income women of color were used as the reference group instead of high-income White men? This *studying up*[14] rather than *studying down* might allow the researcher to discuss the privileges of the dominant economic groups instead of the problems of the groups with lower economic status.

5 Conclusion

This paper shows how to incorporate racial justice topics into an econometrics course. Students select journal articles about race in the economy (for example, articles about racism in the housing and credit markets), present the articles to the class and lead a discussion about them. Students bene t by not only strengthening their econometrics skills but also using evidence-based approach to gain knowledge of the role that racism has played in the economy.

While the topics focus on \the lives and experiences of Black folks in North America and/or the African diaspora" due to being inspired by the Racial Justice Teaching Challenge at my institution, this approach could be broadened to incorporate other races by focusing on, for example, Native American rights discussed by Blanch ower and Feir (2022)

[14] S. Becker and Ariello (2013) provides a de nition of studying up.

and Anti-Asian Hate movement discussed by Lee (2022). This approach could also be extended to include wider topics of diversity, equity, and inclusion (DEI) with topics of gender equity, LBGTQ+ rights, disability rights, immigration, income inequality, poverty, and various topics related to social justice.

References

Allgood, S., and McGoldrick, K. 2021. Using readings beyond the textbook: A survey. *The Journal of Economic Education*, *52* (4), 269{273. doi: 10.1080/00220485.2021.1963375

Angrist, J. D., and Pischke, J.-S. 2017. Undergraduate econometrics instruction: Through our classes, darkly. *Journal of Economic Perspectives*, *31* (2), 125{144. doi: 10.1257/jep.31.2.125.

Apodaca, C. 2009. Overcoming obstacles in quantitative feminist research. *Politics and Gender*, *5* (3), 419{426. doi: 10.1017/S1743923X09990213.

Aronson, B., and Laughter, J. 2016. The theory and practice of culturally relevant education: A synthesis of research across content areas. *Review of Educational Research*, *86* (1),

Black Lives Matter. 2022. Retrieved on March 7, 2022, from blacklivesmatter.com.

Blanch ower, D. G., and Feir, D. L. 2022. Native Americans' experience of chronic distress in the USA. *Journal of Population Economics*, 1{25. doi: 10.1007/s00148-022-00910-4.

Bowman, E. 2020. Racism has an economic cost, Atlanta Fed President warns. *NPR*, July 15, 2020. Retrieved on March 7, 2022, from https://www.npr.org/sections/live-updates-protests-for-racial-justice/2020/07/15/891434373/racism-has-an-economic-cost-atlanta-fed-president-warns.

Briand, G., and Hill, R. C. 2013. Teaching basic econometric concepts using Monte Carlo simulations in Excel. *International Review of Economics Education*, *12*, 60{79. doi: 10.1016/j.iree.2013.04.001.

Button, P., Collins, L. A., Denteh, A., Garc a-Perez, M., Harrell, B., Isaac, E., and Ziedan, E. 2021. Teaching controversial and contemporary topics in economics using a jigsaw literature review activity. *The Journal of Economic Education*, *52*(4), 286{295. doi: 10.1080/00220485.2021.1963373.

Conaway, B., Clark, C., Arias, J. J., and Folk, J. 2018. Integrating econometrics: A modern undergraduate economics capstone experience. *The Journalersialla.3yT50(onomic)-387(3yT5)50(a*

analysis of the neighborhood destination choices of mixed-race couples with children. *Demography*, *56*, 1051{1073. doi: 0.1007/s13524-019-00779-1.

Gunia, A., Nugent, C., Moon, K., Shah, S., and Haynes, S. 2021. The racial reckoning went global last year. Here's how activists in 8 countries are ghting for justice. *Time*, May

Scott, N. A., and Siltanen, J. 2017. Intersectionality and quantitative methods: assessing regression from a feminist perspective. *International Journal of Social Research Methodology*, *20* (4), 373{385. doi: 10.1080/13645579.2016.1201328.

Shertzer, A., Twinam, T., and Walsh, R. P. 2016. Race, ethnicity, and discriminatory zoning. *American Economic Journal: Applied Economics*, *8* (3), 217{246. doi: 10.1257/app.20140430.

Sprague, J. 2016. *Feminist methodologies for critical researchers: Bridging differences.* Lanham: Rowman and Little eld.

Stewart, K. G. 2019. Suits' watermelon model: The missing simultaneous equations empirical application. *Journal of Economics Teaching*, *4* (2), 115{138.

A Appendix

Table A1 shows the instructions provided on the syllabus about the student-led journal article presentations.

Table A1: Instructions about the Student-Led Journal Article Presentations

We will read economics journal articles to see how econometric techniques are used in empirical economics research. These articles will focus on racial justice topics. Follow the below instructions. Instructions for selecting and posting the article: - Your team will choose the journal article. - Select an article related to racial justice. - The article cannot be a reading from another course or the readings for our replication projects. - Choose an article that you nd interesting and want to share. - The article has to be from a peer-reviewed economics journal. If you want to select an article from another source (for example, a working paper series), check with me to ensure that it is an appropriate source. - The article has to include econometrics topics that we have discussed in our class meetings. - The article has to include econometrics topics that we have not discussed in our class meetings yet. - Post the article on our course website discussion board at least one week before your presentation. - Post enough questions about the article for all students to have an opportunity to participate in your discussion. - Include multiple questions about data and econometrics. Instructions for leading the in-class discussion about the article: - Your team will present the article and lead a discussion about it during our class meeting. - Prepare a PowerPoint presentation about the article. - Lead a discussion during our class meeting using the questions that you had posted on our course website. Instructions for students who are not presenting: - If you are not presenting, you are expected to read the article before our class meeting and be prepared to discuss all the posted questions during our class meeting.