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Teaching with the Debt Fixer: An Interactive Online Tool to Manage the National Debt

Over the past decade, there has been a rapid rise in the U.S. federal debt, exacerbated by increased federal spending and lowered federal taxes. These policy decisions have driven the U.S. debt-to-GDP ratio over 100%, an unprecedented level that may serve to stifle future economic growth. Our paper analyzes the Debt Fixer, a tool that allows students to easily examine policy proposals regarding federal spending and taxation and their effects on debt levels. The tool provides educators with a simple and impactful method of engaging students with a meaningful understanding of the balance between federal spending and taxation programs.

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1. Teaching with the Debt Fixer: An Interactive Online Tool to Manage the National Debt

After the recession of 2008, there was a rapid rise in the U.S. federal deficit and debt. Recent events related to the COVID-19 pandemic have further tested the upper-bounds of the federal debt (Hilsenrath, 2020), and these events have served to prompt renewed urgency in the examination of the sustainability of the U.S. federal debt. Major discussion points include the various sacrifices and choices that must be made by the U.S. government to get the deficit and debt back on a sustainable path. Economists have debated about the exact level of government debt that becomes a major impediment to economic growth. Reinhart, Reinhart, and Rogoff (2012) found that average economic growth (across all countries) is 1.2 percentage points lower when debt-to-GDP levels are above 90%, relative to periods where debt-to-GDP are below this number. A study by Kumar and Woo (2010) examining 38 advanced and emerging countries found that an increase of 10 percentage points in the debt-to-GDP ratio is associated with a decrease of 0.2 percentage points in economic growth. A wide variety of studies have found slightly different threshold debt-to-GDP values, ranging from 77% in Elmeskov and Sutherland (2012) to 86% in Cecchetti, Mohanty, and Zampolli (2011). Regardless of the specific threshold, there is widespread agreement that large levels of public debt can have significant negative effects on economic growth (Chudik, Mohaddes, Pesaran, & Raissi, 2017). For students, this may be a major factor in their decision-making and voting behavior, as even relatively modest changes in the economic growth rate may significantly impact their standard of living over their lifetimes.

In most principles of macroeconomics courses, the topic of government debt arises in various places throughout the semester, but the topic of the budgetary and political tradeoffs required to return the debt to a sustainable path is rarely explored in great detail. These concepts may arise incidentally in discussions about current events and policies; however, the focus is usually placed on a single event or policy. By talking about the debt in broad terms, we may be inadvertently minimizing its perceived level of importance to our students.

To address this issue, we demonstrate how using a current economic simulation from the Committee for a Responsible Federal Budget (CRFB) gives the students an up-close view of the tradeoffs that are faced when attempting to balance the budget and stabilize debt levels. The CRFB is a nonpartisan, non-profit organization based in Washington D.C. that is committed to educating the public on issues with significant fiscal policy impact (Committee for a Responsible Federal Budget, 2020a). In this paper, we explore how the Debt Fixer tool provided by the CRFB can be used to provide depth and meaning to these concepts in a way that the traditional chalk-and-talk approach cannot. The tool can be utilized in a face-to-face as well as an online/distance learning setting. The Debt Fixer tool can be used in both a university and high school setting, and directly addresses the Council for Economic Education (CEE) Voluntary National Content Standards in Economics. In particular, standards 1 (scarcity), standard 3 (allocation), standard 13 (income), standard 15 (economic growth), standard 16 (role of government in market failure), and standard 20 (fiscal and monetary policy) are all touched upon when using the Debt Fixer tool (Council for Economic Education, 2020). We have included a detailed list of the specific objectives that can be addressed and measured using the Debt Fixer tool in Appendix 1. Educators will find that the Debt Fixer easily aligns with lesson plans based around the CEE Content Standards.

In response to the COVID-19 pandemic with the delivery of more instructional material and assessments online, there is an increased need to develop online learning opportunities that use active learning techniques in an economics course. Brown, Roediger, and McDaniel (2014) find that creating an interactive learning experience allows for professors to continually

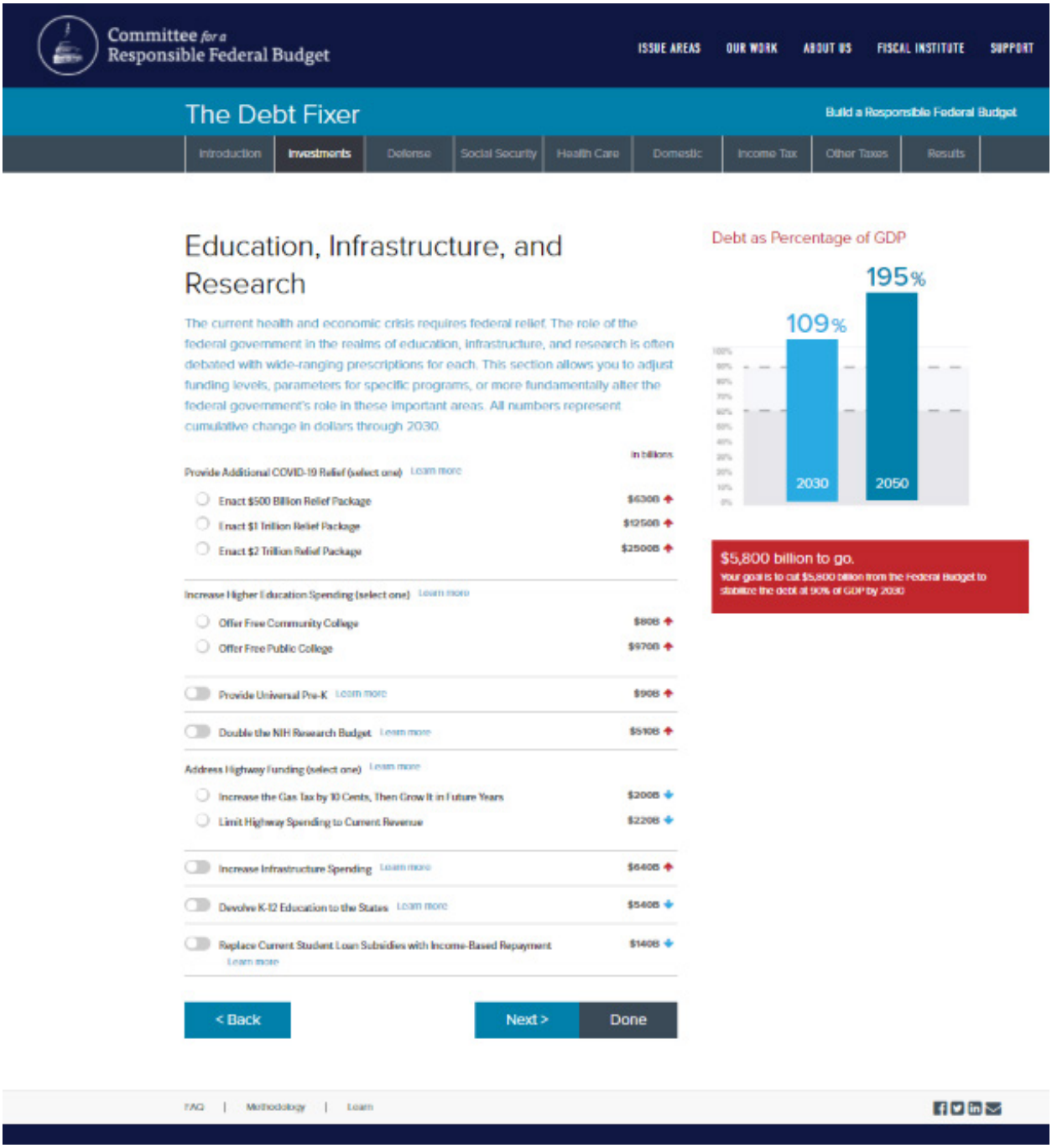
reinforce and reintroduce material leading to greater student learning. The economic education literature is increasingly recognizing and rewarding the development of active learning techniques that can be utilized in the traditional face-to-face setting (see the recent award-winning articles by Clark (2020), Settlage and Wollscheid (2019), and others). Along similar lines, the Debt Fixer tool allows educators to provide students an active, experiential learning activity that can be done individually or in a group, both in a face-to-face setting and in a COVID-19 teaching environment, in both a socially-distanced classroom and fully online. Moving forward in economics education in general (and in a COVID-19 world in particular), there is a need for more flexible and diverse learning tools that provide meaningful interaction and active learning across a variety of delivery platforms.

2. Description of the Debt Fixer Engagement and Target Audience

The Debt Fixer is an online exercise developed by the CRFB to assist students, educators, and citizens in understanding the magnitude of the challenges faced when balancing the budget. In this paper, we discuss the implementation and results of employing the Debt Fixer in three modes of delivery: face-to-face facilitated by representatives from the CRFB, face-to-face facilitated by the instructor, and online in a COVID-19 environment facilitated by the instructor. We explore how individual students (or groups of students) make decisions that lower the U.S. federal deficit and debt to levels that have been determined to be manageable and sustainable by the CRFB. The Debt Fixer tool can be accessed by students, instructors, and individuals by going to the website http://www.crfb.org/debtfixer/ (Committee for a Responsible Federal Budget, 2020b). CRFB has set targets of stabilizing the federal debt-to-GDP ratio in the short-term (by 2030) to 90% and in the long-term (by 2050) to 60%. Instructors may set any individualized target percentage level they wish, as the tool is completely interactive and will automatically adjust debt levels as students implement policy decisions.

The Debt Fixer webpage provides an introduction and overview of the problem of the debt and explains how the problem has become worse over time due to tax cuts and spending increases, even in good economic years. Now that the nation faces the COVID-19 economic crisis, the website invites participants to make the tough decisions necessary to stabilize the debt. As students begin the process, they are guided through a variety of categories of spending plans and taxes that affect the federal budget. These categories are investments, defense, social security, health care, domestic, income tax, and other taxes. Each category provides a basic introduction to how the category influences the debt in the United States. For each category, the student is provided with a list of policy choices that are currently or often discussed in the news. Each policy decision provides an estimate for the cumulative cost or savings of each decision in dollars through the year 2030. In addition, each decision point allows the participant to learn more about their choices with a brief description of the policy options available. Some policy decisions will also let the students decide on different levels of spending or saving. Figure 1 shows a sample page from the Debt Fixer that illustrates the choices students face regarding education, infrastructure, and research, including policy decisions related to COVID-19 relief.

Figure 1: Debt Fixer Sample Page



As Figure 1 shows, students are faced with a variety of choices and consequences regarding policy decisions. For example, various levels of COVID-19 relief policies are available. Each choice details the effect of the federal budget on both the short- and long-term debt targets. Selecting an option will automatically adjust the height of the bars that show the debt as a percentage of GDP on the right of the screen. Also, each choice has a clickable link that students can use to 'learn more' about the decisions they are making. Another policy decision that students face involves increased higher education spending. The student has the choice

to offer free community college, free public college for four-year institutions, or neither. When selecting the 'learn more' button, participants are told how lawmakers are seeking ways to make college more affordable via the multiple options available, including total cost, who pays, and how much they pay. When the participant has finished making their decisions, they can see their savings or spending by category as well as print out the decisions they made.

Instructors can contact the CRFB to set up a dedicated group online that allows the instructor to directly analyze the results from their individual class or classes. The prime benefit of the Debt Fixer is that instructors now have a way of introducing a discussion about fixing the federal debt by having students actively participate in the process, even in a COVID-19 socially distanced setting. This allows discussion about the actual costs of the various newsworthy programs that students have seen and may support. This tool interactively helps students better conceptualize what needs to be done to address the federal debt and illustrates just how hard it is to reduce the debt.

3. Implementation of the Debt Fixer in a Classroom Setting

Instructors are often leery about introducing new teaching concepts and tools. We have utilized the Debt Fixer tool in multiple settings at our university in large group settings, in smaller in-class settings, and in a COVID-19 online-only setting. In each instance, the feedback and student participation were overwhelmingly positive. It is an incredibly simple and effective method of introducing a discussion on the national debt while engaging students with an active learning activity.

4. Debt Fixer Facilitated by the CRFB

The Debt Fixer tool was first used by our university as a learning opportunity for our students that was hosted in a large ballroom during a Friday lunch period. This was sponsored by a local bank and was first held in coordination with the CRFB in the fall of 2018. A local bank president who is passionate about the national debt wanted to find a way for our students to become engaged in the discussion about the national debt. The university hosted the event and a representative from CRFB came to campus to speak with our students about the debt, with free lunch and t-shirt giveaways sponsored by the local bank to incentivize students to attend. The event was open to all students across campus, and we had well over 100 students attend the event. After the discussion, students broke into groups of six to eight students and discussed the policy actions they wished to take to manage the federal debt. Everyone involved in the learning opportunity walked away impressed with the level of student involvement and commitment. The event was such a success that the bank sponsored the Debt Fixer event again the following year, with plans to make it an annual event.

As economics professors, it was refreshing to see students so thoroughly engaged in the material at these events. Students would routinely ask multiple questions and stop by during office hours days or even weeks after the event to further discuss economic policies surrounding the debt. The CRFB-facilitated format provides the instructor with the ability to discuss the federal debt and decisions made by policymakers to a large audience simply and coherently. We believe that such an event could be easily run in conjunction with local banks, civic groups (e.g. Rotary International, chamber of commerce, etc.), or student-run clubs at institutions of all sizes to provide both students and concerned community members a solid introduction to, and awareness of, the vexing problems faced when striving to lower the federal debt.

5. Debt Fixer in a Classroom Setting Facilitated by the Instructor

We also conducted the Debt Fixer in a classroom setting facilitated by the instructor in

the spring of 2020. We elected to conduct it in a similar manner to the way it was administered in the large group setting above, but it was open only for students that were enrolled in the principles of macroeconomics course rather than the entire university community. It was offered as an extra credit opportunity on a Friday afternoon that created two sets of students, those that attended and those that did not attend. In addition to the group setting used, the Debt Fixer can easily be run in an individual classroom in a single class period. We contacted CRFB through the website to set up a group for our students' responses, which allowed us to look at the Debt Fixer results for our class without having data from other Debt Fixer users in the sample. This allowed us to follow-up in a later class session by discussing specific policies that our students selected, with a focus on why they decided on certain policies and the ramifications of their selections. Rather than using abstract and overly vague discussions about how policy decisions affect the debt, the students saw how their specific policy decisions influenced the federal debt. Often in economics, we discuss trends in the federal debt without going into great detail about how policymakers' decisions directly influence the debt. This tool allows these detailed discussions to easily occur in a classroom, as each participant has a stake in the outcome by defending their individual policy choices. While we deemed this iteration of the Debt Fixer was a great success and we had plans to make it a permanent activity in our principles of macroeconomic courses, the COVID-19 pandemic forced us to move our classes and this exercise to an online setting.

6. Debt Fixer in a COIVD-19 Setting: Online Facilitated by the Instructor

This iteration of the Debt Fixer was conducted in Fall 2020 fully online, with individual students (rather than groups of students) using the tool and submitting their results to the group established by the CRFB. This shift allowed implementation of the Debt Fixer in an online setting in the COVID-19 world, however, the individual nature of this iteration came at the unavoidable expense of group discussions, where students had to iron out and defend their differences of opinion with their fellow groupmates when making a policy selection. To combat this loss, we required students to write a brief reflective summary concerning their decisions and how they evaluated and felt about the trade-offs they had to make while tackling the debt. We also had them reflect on why policymakers may be reluctant to make the difficult decisions necessary to lower the debt. Though we did not utilize the option, students could be easily prompted to respond to different selected topics on a discussion board to highlight the differing views among various students. In addition, online student groups could easily be formed and meet virtually, thus bringing back some of the group dynamics that were lost when shifting to a fully online setting.

In addition to the benefits of the Debt Fixer tool in encouraging a deeper understanding of the debt, a prime advantage of the tool is the versatility it provides regarding modes of delivery. It can be utilized to engage students in a large group setting with hundreds of participants, in smaller settings with a limited number of participants, or as an individual or group online exercise. By making participants choose a combination of policies to achieve their goal, it fosters a deep level of thinking about how political leaders attempt to manage the debt while still serving other policy goals.

7. Incorporating Debt Fixer into Further Instruction

As previously mentioned, the Debt Fixer can be used as the perfect segue to introduce further discussion on a variety of topics. Instructors can look at their individual results and select items that their classes feel are important and use these as jumping-off points for further discussion. For example, one issue that we expanded upon in subsequent class periods came out of the observation that 56% of the Debt Fixer participants elected to 'Increase (the) Corporate Tax Rate from 21% to 25%'. We also found consistent student support for decreasing

infrastructure spending after participating in the Debt Fixer event. These observations can be used to further explore issues related to the areas that the students deem most important.

8. Corporate Tax Class Discussion

The Debt Fixer shows students that increasing the corporate tax rate to 25% will reduce the debt by $500 billion and reduce the debt/GDP ratio by 2% by 2030, with a further reduction in the debt/GDP ratio of 5% by 2050. Although the economic effects of increasing the corporate tax are 'baked in' to the Debt Fixer, students may not understand this and may view the numbers as simple ratios (e.g. they may believe by doubling the 4% increase in corporate tax rates to an 8% increase would drop the debt/GDP ratio by 4% by 2030 and 10% by 2050). This provides the perfect opportunity to engage the class in a follow-up discussion of the effect of increasing corporate taxes.

Discussion could begin by exploring who bears the burden of increasing the corporate tax rate: the corporation's owners, employees, customers, or citizens in general. This can lead to discussions on the effect of increasing the tax rate and the Laffer curve, as it is important for students to understand that doubling taxes does not double tax revenue. A discussion of tax extremes can be introduced by asking students what they think would happen to tax revenue and debt levels if the tax rate was increased to 100%. In this manner, the downward-sloping portion of the Laffer curve can be introduced and explored. This is a perfect gateway to getting students to see the picture in dynamic terms, in this case, that tax changes are not simply a matter of ratios. In addition, incentives for firms to relocate offshore in response to tax changes can be explored, along with the associated reduction in tax revenue and economic activity. Finally, the idea that increasing corporate tax rates may discourage innovation and investment can be introduced and explored, in a short-run aggregate demand/aggregate supply framework and/or in a long-run discussion about economic growth. All of these concerns are teaching points and become part of a broader discussion regarding the options that the government has to control the debt.

9. Infrastructure Spending Discussion

In the Debt Fixer activity, students are presented with two major choices concerning infrastructure spending. The first choice concerns funding highway spending. The Debt Fixer allows students to choose two options concerning highway spending that both decrease the debt. The first choice raises the gasoline tax by 10 cents and indexes the tax to inflation. The second choice limits highway infrastructure spending to current federal gasoline tax revenue. Looking at the results from our classes, 59% of the students would limit highway spending to current revenue and 25% of our students would raise gasoline taxes. The next major choice faced by students concerns an overall increase of $500 billion to infrastructure spending for roads, rails, ports, airport systems, water systems, etc. Only 6% of our students chose this option, which would serve to increase the debt. Based on individual class results, the discussion can form around the specific ideas identified as important by the students.

For our students, the discussion may focus on the importance of infrastructure to economic growth. Highlighting what students are really giving up when they choose to reduce infrastructure spending is important. Students may not be aware of the relationship between improved infrastructure and future economic growth, productivity, and tax revenue. Intertemporal and intergenerational tradeoffs can be introduced and discussed. How much are we willing to spend today for increased growth in the future? Is it fair to cut infrastructure spending for our benefit while saddling future generations with lower growth rates? Depending on the level of the class, the effect of infrastructure on the aggregate supply curve or the production possibilities curve can be explored. Also, economic history can be brought into

the discussion by highlighting the importance that transportation and other infrastructure investments have historically played in trade and economic growth. Historical examples include the Silk Road, spice routes, and wagon and rail routes, while the federal aviation and highway systems highlight the current importance of infrastructure to the economy. As a counterbalance, focus can be placed on decisions where students were willing to increase the federal debt with more infrastructure spending. Discussion can center on the opportunity cost of that increased infrastructure spending. What are we giving up by increasing infrastructure spending? How much spending are we giving up in other areas such as education or health and nutrition that might promote economic growth? The goal of discussing opportunity costs is to allow students to understand the constant tradeoffs faced by government officials in determining how to allocate resources across many competing choices.

10. Other Discussion Areas

The above two examples show how to incorporate and extend the discussion of ideas from the Debt Fixer in a class setting. The Debt Fixer has a total of 89 different policy measures, any one of which an instructor can use as a jumping-off point for further exploration of specific issues/topics. In this manner, instructors can use the Debt Fixer as a touchstone, to introduce a variety of ideas to students throughout the semester. Furthermore, depending on the level of the class and the inclination of the instructor, the ideas of Modern Monetary Theory (MMT) can be introduced to examine the validity of the entire premise of the Debt Fixer, that public debt is a problem that needs to be solved.

11. Results and Discussion of Debt Fixer Outcomes

In addition to the mechanics of administering the Debt Fixer across various modes of delivery, we gathered both quantitative and qualitative data about student attitudes, engagement, and experiences to assess if the activity made a demonstratable impact.

12. Quantitative Data About Student Attitudes

We conducted three identical surveys of student attitudes regarding the debt. The surveys were administered one week prior to the event, one week after the event, and again at the end of the semester (eight weeks after the event). The surveys were given to students enrolled in principles of macroeconomics (a 2000-level class typically taken by sophomores from across campus) for the 2019/2020 academic year, regardless of their attendance at the Debt Fixer event. The survey instrument is found in Appendix 2.

We were interested in capturing student attitudes toward the debt and the policy components of the debt, both before and after their experience with the Debt Fixer. In addition to any changes in attitude they experienced, we wanted to determine if these changes were long-lasting. One challenge in analyzing the survey data is the fact that not all students attended the Debt Fixer as the event was not required when we gathered the survey results. We capitalized upon this by comparing the change in the attitude of students that did attend the Debt Fixer to the change in attitudes of those who did not. It would be improper to simply compare mean scores, as student learning via class is occurring throughout the semester, thus influencing student attitudes (even for non-attendees). By comparing the change in the attitude of attendees to non-attendees, we more closely isolate the effect of the Debt Fixer itself.

Table 1 presents the number of responses and number of matches broken out by attend and non-attend students. The survey was given during one academic year (Fall 2019 and Spring 2020) to a total of seven course sections with a total enrollment of 245 students at the

beginning of the semester. The number of survey responses is less than the total enrollment due to three factors: survey refusal, student absenteeism, and student drops. We categorize the respondents by their attendance at the Debt Fixer. As Table 1 shows we have a roughly even split of responses from attendees and non-attendees. Since each student had the opportunity to fill the survey out at three different points in the semester, we match survey 2 and survey 3 responses back to the student's survey 1 response, which allows us to conduct paired tests of statistical significance. As Table 1 shows, we have a fairly large number of matches, with matched sample sizes ranging from 66 and 81 depending on the survey and student categorization.

Table 1: Debt Fixer Data Sample

	Number of Sections and Students	
Semester	Number of Class Sections	Number of Students
Fall 2019	3	95
Spring 2020	4	150
Total	7	245

	Number of Survey Responses by Attendee Type	
Survey	Attend	Non-Attend
Survey 1	81	119
Survey 2	91	79
Survey 3	74	86
Total	246	284

	Number of Matching Pairs by Attendee Type	
Survey Match	Attend	Non-Attend
Survey 1-2	81	69
Survey 1-3	66	70
Total	147	139

Notes: The number of surveys in total exceed the total number of students because each student could have filled out three different surveys (survey 1, 2, and 3).

Table 2 presents the mean student responses to the survey, broken out by attend and non-attend students. Although the students elected to participate in the Debt Fixer of their own volition, an examination of Table 2 reveals that the attendees and non-attendees start with generally similar attitudes/responses towards debt. The mean response of attend and non-attend students differ from each other by an average of only 0.09 points. In addition, there is a shift in the attitudes of the students who attended. In all 20 survey questions, the attitude of those who attended the Debt Fixer shows an increase in concern for the debt and favorability of policy choices that would lessen the debt. This pattern did not hold true for the non-attendees, with non-attendees showing policy attitudes that would lead to increased debt in the areas of veterans spending, education and research, infrastructure, social security, farm subsidies, environmental protection programs, and corporate taxation. Although the students started out with similar attitudes, students who participated in the Debt Fixer emerge with different attitudes toward the debt and the factors that influence it than their non-attending counterparts.

Table 2: Survey Responses About the Debt

	Attend			Non-Attend		
Question	Survey 1	Survey 2	Survey 3	Survey 1	Survey 2	Survey 3
Q1: Debt out of control	3.85	4.12	4.16	3.85	3.87	3.98
Q2: Concerned about the debt	3.51	3.91	3.87	3.40	3.76	3.66
Q3: Debt is not a major problem	2.23	1.98	1.85	2.26	2.19	2.20
Q4: Debt will be paid off in 50 yrs.	2.00	1.93	1.96	1.96	1.89	1.93
Q5: Debt threatens econ. growth	3.19	3.67	3.57	3.19	3.53	3.38
Q6: Willing to accept the tradeoff	2.74	2.92	3.04	2.59	2.94	2.98
Q7: National defense	2.89	3.17	2.96	2.70	2.90	2.94
Q8: Veterans spending	2.49	2.92	2.84	2.52	2.50	2.58
Q9: Foreign aid programs	3.27	3.51	3.53	3.41	3.46	3.55
Q10: Education and research	1.88	2.22	2.03	2.02	1.98	1.97
Q11: Infrastructure	2.40	2.75	2.56	2.55	2.53	2.56
Q12: Social security	2.99	3.25	3.20	3.03	3.11	2.97
Q13: Health care	2.83	3.04	2.85	2.63	2.83	2.73
Q14: Domestic spending programs	3.05	3.28	3.29	3.18	3.45	3.19
Q15: Farm subsidies	2.79	2.88	2.81	2.93	2.84	2.90
Q16: Food stamps	3.44	3.80	3.63	3.45	3.55	3.48
Q17: Enviro. protection programs	2.52	2.70	2.76	2.49	2.70	2.48
Q18: Individual income taxes	3.30	3.02	3.23	3.31	3.26	3.20
Q19: Corporate	2.59	2.24	2.28	2.33	2.54	2.48
Q20: Other taxes	2.90	2.53	2.69	2.85	2.80	2.74
Number of Observations	81	91	74	119	79	86

Notes: The values reported are the average response to the Likert scale questions regarding general attitude toward debt, with a 1 being strongly disagree and a 5 being strongly agree. Survey 1 was administered 1 week before Debt Fixer, Survey 2 was administered one week after Debt Fixer, and Survey 3 was administered 8 weeks after Debt Fixer (at the end of the semester). Sample sizes reported differ by survey number because students may not have filled out all three surveys due to refusal, absence, or dropping the course.

Table 3 presents the change in spending attitude for attendees and non-attendees from the surveys given one week before and one and eight weeks after the Debt Fixer, with associated t-tests. The change in belief for each student was calculated by taking the difference between the choice selected by the student one week before the event and one or eight weeks after the event. We ran paired two-tailed t-tests to determine if the change in belief of the students who did attend the Debt Fixer was significantly different from the mean change in belief of students who did not attend the Debt Fixer. In this manner, the students who did not attend the Debt Fixer serve as the reference or control group. The one-week results from Table 3 show in all 11 categories that attendees were more likely to report favorable attitudes regarding decreasing spending, whereas non-attendees report favorable attitudes to decreasing spending in only six out of 11 of the spending categories. In addition, the attitudes of attendees were statistically significantly different than the mean change of the non-attendees in six of the 11 categories. In all of the statistically significant categories, attendees were more likely to have an attitude shift toward cutting federal spending than non-attendees. This attitude shift was largest in the areas of veteran spending, food stamps, infrastructure, and education and research.

As the eight-week results from Table 3 show, in 10 of 11 categories, attendees were more likely to report favorable attitudes toward decreasing spending (the sole exception being health care), whereas non-attendees report favorable attitudes toward decreasing spending in only seven out of 11 of the spending categories. Also, the attitudes of attendees were statistically significantly different than non-attendees in 6 of the 11 categories. In all of the statistically significant categories, attendees were more likely to have an attitude shift toward cutting federal spending than non-attendees. The attitude shift was largest in the areas of veterans spending and domestic spending. Comparing the one- and eight-week after results shows the weakening effect of duration on attitude shifts. While attendees are still more likely to be amenable to spending cuts across the board, their attitudes have weakened relative to one week out in all areas except for foreign aid and health care.

Table 3: Spending Attitudes after Debt Fixer

	One Week After Debt Fixer			
	Attend	Non-Attend	Difference	P-Value
National defense	0.260	0.290	-0.031	0.793
Veterans spending	**0.395**	**-0.072**	**0.468*** **	**0.000**
Foreign aid programs	**0.210**	**-0.015**	**0.225** **	**0.028**
Education and research	**0.334**	**-0.102**	**0.435*** **	**0.000**
Infrastructure (e.g. roads and bridges)	**0.345**	**-0.043**	**0.389*** **	**0.001**
Social security	0.263	0.072	0.190	0.122
Health care (Medicare and Medicaid)	**0.210**	**0.000**	**0.210***	**0.094**
Domestic spending programs	0.222	0.189	0.034	0.770
Farm subsidies	0.074	0.029	0.045	0.650
Food stamps	**0.345**	**0.131**	**0.215***	**0.078**
Environmental protection programs	0.161	0.131	0.030	0.800

	Eight Weeks After Debt Fixer			
	Attend	Non-Attend	Difference	P-Value
National defense	**0.000**	**0.272**	**-0.271**	**0.051**
Veterans spending	**0.348**	**0.029**	**0.320*** **	**0.006**
Foreign aid programs	0.242	0.058	0.184	0.136
Education and research	**0.197**	**-0.143**	**0.340*** **	**0.003**
Infrastructure (e.g. roads and bridges)	**0.151**	**-0.129**	**0.280** **	**0.011**
Social security	**0.169**	**-0.057**	**0.226***	**0.075**
Health care (Medicare and Medicaid)	-0.030	0.043	-0.073	0.623
Domestic spending programs	**0.288**	**-0.043**	**0.331** **	**0.024**
Farm subsidies	0.045	0.043	0.003	0.980
Food stamps	0.151	0.043	0.109	0.447
Environmental protection programs	0.197	0.057	0.140	0.328

Notes: The change in beliefs for each student was calculated by subtracting the choice selected by the student one week before the event from one or eight weeks after the event. If the change is ***positive***, this indicates that a student became ***more*** likely to ***decrease*** spending in that category. The change in beliefs of the students who attended the Debt Fixer was tested against the change in beliefs of the student who did not attend the Debt Fixer. P-values are from the paired two-tailed t-test, with statistically

significant results noted with a *** = 1%, ** = 5%, and * = 10% level of significance. Sample size for the one-week after table is 81 and the sample size for the eight-week after table is 66. One- and eight-week after sample sizes reported are for attendees and differ because students who participated in the first Debt Fixer may not have filled out one or both of the remaining surveys due to refusal, absence, or dropping the course.

Table 4 presents the change in taxation attitudes for attendees and non-attendees from the surveys given one week before and one and eight weeks after the Debt Fixer, with associated t-tests. The score can be interpreted as the mean change in attitude (on a 5-point Likert scale) between the two survey periods. As the one-week results from Table 4 show, in all three categories, attendees were more likely to report favorable attitudes toward increasing taxes, whereas non-attendees report favorable attitudes toward increasing taxes in only one out of three of the taxation categories. In addition, the attitudes of attendees were statistically significantly different than non-attendees in two of the three categories. In all of the statistically significant categories, attendees were more likely to have an attitude shift toward increasing federal taxes than non-attendees.

As the eight-week results from Table 4 show, attendees were more likely to report favorable attitudes toward increasing taxes in all three categories, whereas non-attendees report favorable attitudes toward increasing taxes in two out of three of the taxation categories. The attitudes of attendees were statistically significantly different than non-attendees in one of the three categories. In the one statistically significant category, attendees were more likely to have an attitude shift toward increasing federal taxes than non-attendees. Similar to the change in spending attitudes, comparing the one- and eight-week after results shows the weakening effect of duration on taxation attitude shifts. While attendees are still more likely to be amenable to tax increases across the board, their attitudes have weakened relative to one week out in all three taxation areas.

Table 4: Taxation Attitudes After Debt Fixer

	One Week After Debt Fixer			
	Attend	Non-Attend	Difference	P-Value
Individual income taxes	-0.284	-0.131	-0.154	0.140
Corporate	**-0.334**	**0.116**	**-0.449**	**0.001**
Other taxes (e.g. estate, wealth)	**-0.358**	**0.029**	**-0.387**	**0.004**

	Eight Weeks After Debt Fixer			
	Attend	Non-Attend	Difference	P-Value
Individual income taxes	-0.091	-0.222	0.131	0.189
Corporate	**-0.273**	**0.079**	**-0.351**	**0.014**
Other taxes (e.g. estate, wealth)	-0.106	-0.079	-0.027	0.852

Notes: The change in beliefs for each student was calculated by subtracting the choice selected by the student one week before the event from one or eight weeks after the event. If the change is negative, this indicates that a student became more likely to increase taxes in that category. The change in beliefs of the students who attended the Debt Fixer was tested against the change in beliefs of the student who did not attend the Debt Fixer. P-values are from the paired two-tailed t-test, with statistically significant results noted with a *** = 1%, ** = 5%, and * = 10% level of significance. Sample size for the one-week after table is 81 and the sample size for the eight-week after table is 66. One- and eight-week after sample sizes reported are for attendees and differ because

students who participated in the first Debt Fixer may not have filled out one or both of the remaining surveys due to refusal, absence, or dropping the course.

13. Qualitative Data About Student Attitudes

While the quantitative data paints a compelling picture of the effectiveness of the Debt Fixer exercise, the qualitative student feedback reinforces these findings. Below is a sampling of anonymous student quotes harvested from surveys conducted immediately following the administration of the Debt Fixer.

14. Specific Comments About the Hardest Decision Students Had to Make

1. "The hardest choice about the debt fixer was reducing veteran benefits."
2. "Health care was our hardest choice but ended up being the one that saved the most."
3. "The hardest decision we made was to make cuts on environmental spending."
4. "The hardest choice we made was taxing CO_2 emissions."
5. "The hardest decision that we made was to devolve k-12 education to the states."
6. "The most difficult part of this was messing with healthcare and veterans."
7. "Our most difficult decision was raising the retirement age."

15. General Comments About the Debt Fixer Exercise

1. "I mean I fixed the National Debt but at what cost? Did I make Americans quality of living worse? Probably. Did I fix the Debt? You bet."
2. "We were surprised by how much we had to decrease to get it to our goal."
3. "We realized how tough it is to make these decisions alone."
4. "The most difficult part of this experience was holding true to our deepest morals and values while attempting to improve the futuristic economy of our nation."
5. "Our experience participating in the debt fixer assignment was quite difficult because we noticed exactly the struggles that politicians have to decide for us. We learned what they are debating upon, and we found it difficult to mess with military spending since we believe those are definitely a priority."
6. "The hardest thing about this whole lecture was deciding other's future."
7. "This was a good experience because we were uneducated on how much debt our nation is actually in."
8. "We all enjoyed the experience. We realized how tough it is to make these decisions alone."
9. "I am going to pay a lot of taxes later."
10. "We fixed the debt, but boy, I feel like a horrible person."

As the comments illustrate, students were serious about the task at hand and they had to put deep thought into the consequences of their choices. While administering the Debt Fixer, it was obvious that the decisions that students were making were taken seriously by most participants. Several groups questioned if it was even possible to achieve the relatively modest target debt goals. Observed levels of student engagement far exceeded what we see in a typical chalk-and-talk setting.

16. Conclusions

In this paper, we have explored how to run a simple exercise that works for both high school and college populations in a variety of delivery modes. In a COVID-19 world, it is critically important to employ methods to keep students engaged, even while learning remotely. The Debt Fixer does this, and we show that it has a material effect on student attitudes toward federal spending and taxation. The game is easy to set up, and the CRFB is responsive in facilitating sessions and setting up classes for instructors who so desire. The difficulty of managing the debt while balancing spending and taxation programs is illustrated in a simple to understand and impactful way. We believe the outcome of the game is best summed up by a student who said they managed to reach the target debt levels, but "I feel like a horrible person." As economic educators, it is incumbent upon us to turn out a well-informed citizenry that is concerned with the economic future of the nation and understand the tradeoffs our elected officials struggle with when attempting to reduce the national debt. We believe the Debt Fixer tool helps achieve these goals.

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Appendix 1: Voluntary National Content Standards in Economics

At the completion of Grade 12, students will know the Grade 4 and Grade 8 benchmarks for this standard, and also that:	At the completion of Grade 12, students will use this knowledge to:
Content Standard 1: Scarcity	
Choices made by individuals, firms, or government officials are constrained by the resources to which they have access.	Compare the choices available to high school seniors from families with different income levels. Explain how choices will affect the students' lifetime income.
Choices made by individuals, firms, or government officials often have long run unintended consequences that can partially or entirely offset or supplement the initial effects of the decision	Explain how a high school senior's decision to work 20 hours per week during the school year could reduce her lifetime income. Also, explain why new highway construction may not reduce highway congestion.
Content Standard 3: Allocation	
Comparing the benefits and costs of different allocation methods in order to choose the method that is most appropriate for some specific problem can result in more effective allocations and a more effective overall allocation system.	Examine various allocation methods that are used in different countries, to solve a particular problem, and select the one that provides the most effective method for allocating resources, and explain why this method is effective. Also, assess the effectiveness of various methods for allocating organ transplants, hunting and fishing licenses, elective offices, time with a parent, education resources, health care, and military service.
Changing the distribution of income or wealth will cause the allocation of resources to change.	Explain how raising the Social Security tax on workers in order to pay higher benefits to retirees causes the allocation of resources to change
Content Standard 13: Income	
Changes in the structure of the economy, including technology, government policies, the extent of collective bargaining and discrimination, can influence personal income.	Explain how changes in the structure of the economy, including technology, government policies, the extent of collective bargaining and discrimination have influenced personal income over the last 25 years.
The hope of achieving wealth can affect productivity by energizing people to work harder, while the hopelessness of escaping poverty can discourage people from trying.	Identify a successful entrepreneur from your region who grew up in modest circumstances.
Content Standard 15: Economic Growth	

Historically, economic growth that raises per capita output has been a vehicle for alleviating poverty and raising standards of living.	Compare the standard of living of individuals living in the United States in 1800, 1900, and 2000; explain the relationship between higher production levels, new technologies, and standard of living.
The rate of productivity increase in an economy is strongly affected by the incentives that reward successful innovation and investments (in research and development, and in physical and human capital).	Explain how extending the length of copyright and patent protection affect the incentives to invest.
Content Standard 16: Role of Government and Market Failure	
Different tax structures affect consumers and producers differently.	Analyze the following situation: A government has to raise $100 billion of revenues. It can do so through a sales tax or a progressive income tax. Explain the effect of each tax on a low income and a high-income family.
Governments provide an alternative to private markets for supplying goods and services when it appears that the benefits to society of doing so outweigh the costs to society. Not all individuals will bear the same costs or share the same benefits of those policies.	Discuss the costs and benefits of public education and identify who gains and who bears the costs.
Content Standard 20: Fiscal and Monetary Policy	
Fiscal policies are decisions to change spending and taxation levels by the federal government. As fiscal policies, these decisions are adopted to influence national levels of output, employment, and prices.	Identify historical examples of fiscal policies and explain why these policies were adopted.
The federal government's annual budget is balanced when its revenues from taxes (and other sources) equal its expenditures. The government runs a budget deficit when its expenditures exceed its revenues. The government runs a surplus when its revenues exceed its expenditures.	Determine what is likely to happen to the federal budget deficit or surplus when the economy is growing and when economic activity is declining
When the government runs a budget deficit, it must borrow to finance that deficit.	Explain that federal deficits are financed through the sale of government securities.
The national debt is the accumulated sum of all its past annual deficits and surpluses.	Distinguish between deficits and debt. Explain how federal budget deficits and surpluses affect the national debt.

Appendix 2: Survey Instrument

Please answer the following questions. Enter whole number values only.

General Debt Questions

1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree

_____ 1. The national debt is out of control

_____ 2. I am concerned about national debt

_____ 3. The national debt is not a major problem faced by the nation

_____ 4. The national debt will be paid off in the next 50 years

_____ 5. The national debt threatens economic growth and the standard of living of all Americans

_____ 6. I would be willing to accept a smaller government with less services for a reduction in the national debt

If you were making up the federal budget this year would you increase or decrease spending on the following items?

1 strongly increase, 2 increase, 3 neither increase nor decrease, 4 decrease, 5 strongly decrease

_____ 7. National defense

_____ 8. Veterans spending

_____ 9. Foreign aid programs

_____ 10. Education and research

_____ 11. Infrastructure (e.g. roads and bridges)

_____ 12. Social security

_____ 13. Health care (Medicare and Medicaid)

_____ 14. Domestic spending programs (e.g. non-defense spending, federal workers)

_____ 15. Farm subsidies

_____ 16. Food stamps

_____ 17. Environmental protection programs

If you were making up the federal budget this year would you increase or decrease taxation on the following items?

1 strongly increase, 2 increase, 3 neither increase nor decrease, 4 decrease, 5 strongly decrease

_____ 18. Individual income taxes

_____ 19. Corporate

_____ 20. Other taxes (e.g. estate, wealth)

filled out one or both of the remaining surveys due to refusal, absence, or dropping the course.