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DISCUSSION PAPER SERIES

IZA DP No. 17640

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ABSTRACT

"Pop" Goes the National Debt

This paper provides a novel way for instructors to teach about the perils of a large National Debt, which is currently $36 trillion. We provide a detailed lesson plan that utilizes balloons to illustrate the possible paths a society can take to address this issue. The lesson plan consists of an introduction, images and data that can be used to spur discussion and reflection, how to utilize the balloons to help students understand three different debt scenarios, and a series of follow-up questions and answers to help debrief the activity.

JEL Classification: A20, A21

Keywords: budget, debt, debt-to-GDP ratio, deficits, fiscal policy, national debt, revenue, spending

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1. Introduction

We have developed an interactive lesson plan to help students understand how difficult it is to "fix" the National Debt through fiscal policy. According to data supplied by the Treasury Department (2024), the United States has a debt-to-GDP ratio of 129%, one of the highest in the world. In starker terms, the national debt is $36 trillion, or over $100,000 per American citizen. How did this happen when personal finance teaches us the basic principles of money management: spend less than you make, save for the future, and invest in things that have growth potential. Our nation's central bank, The Federal Reserve, provides teachers and students with hundreds of lessons pertaining to personal finance. Their curriculum teaches children from kindergarten to high school traditional, sound financial advice of staying within your means. Why don't our nation's elected officials adhere to these same principles?

For decades politicians have talked about "sustainable" debt but this has real costs that are rarely talked about. Instead of spending money on interest payments, we need to ask what else we could have spent the money on. The annual interest payments on the debt ($1.13 trillion) are more than the government budget for military ($0.826 trillion) and education ($0.268 trillion) combined. We're making interest payments rather than budgeting more for security, improved health outcomes, and better educational attainment. That's why our current debt is not desirable. Another reason is that debt burdens future generations to pay off what our indebted society now enjoys. Debt should not be a political shell game that gives current voters more than they can afford. Unfortunately, fiscal responsibility in Washington is rarely on the agenda, but vote buying is. And even though they do not yet have a vote, Gen Alpha would surely prefer not to inherit the mismanaged financial burdens of previous generations.

Our leaders talk about the debt-to-GDP ratio, when they could be talking about ways to create a national rainy-day fund, a contingency for when the next pandemic, war, or calamity strikes. That's not a radical idea; according to annuity.org, 89% of adults report having emergency savings (Turner 2024). Is it too much to ask for fiscal policy makers to do likewise? If you or I accumulate too much debt, we know that we become slaves to our debt or, worse yet, end up bankrupt. Most of us understand this, yet our leaders that run this country have consistently shown that they do not have the will to act responsibly.

To help students appreciate the difficult situation we find ourselves in, we should lean into policies that create more growth in GDP in the long run. We owe it to ourselves and future generations to reduce our $36 trillion debt.

We begin by surveying the economic education literature on the National Debt in Section 2. From there, we develop an interactive lesson plan in Section 3 that makes the debate about the National Debt visceral. Section 4 offers concluding remarks.

2. Literature Review

Research has shown that conducting in-class experiments is a teaching tool that is effective in improving student outcomes (Dickie 2006). Although there is no strong consensus about the efficiency of performing experiments (Picault 2019), they improve

student engagement and motivation (Logan 2022) and allow students to learn in an active, experiential way that makes even complex concepts easier to understand and more memorable, leading to greater performance (Settlage et al. 2019). The economics education literature contains a range of classroom activities designed to facilitate understanding of core economics concepts, including building economic models (Geerling et al. (2019), comparative advantage and trade (Hong 2019), law of supply (Geerling and Mateer 2015), willingness to pay and consumer surplus (Schubert 2023), product differentiation via a blind taste test (Geerling and Mateer 2021), marginal utility and utility maximization subject to a budget constraint (Raboy 2017) and others.

Educators in American classrooms employ various interactive methods to teach students about the national debt, aiming to make this complex topic more accessible and engaging. The most common approaches include:

A. Budget Simulations: Students assume the role of policymakers, making decisions on federal spending and taxation to understand the challenges of balancing the national budget. The John F. Kennedy Presidential Library offers a "Federal Budget Simulation" where students debate national priorities by creating their own simulated federal budgets.[1]

B. Educational Games: The Foundation for Teaching Economics offers lessons such as "Our National Debt," introducing students to the complexities of debt accumulation and its historical context.[2] The Foundation for Teaching Economics has proposed an activity in which students are invited to be decision makers who have to put the federal budget on a sustainable path. To do so, they need to explore alternative policies, their costs and benefits, and select a policy that could best accomplish a selected goal while bringing the debt-to-GDP ratio to a sustainable level. An alternative activity challenges students to question some common myths and misunderstandings related to the national debt through a Kahoot! competition. Miller et al. (2023) propose another activity called the Fiscal Ship game in which students choose goals and then select policies to balance their own values (achieve their own goals) with the fiscally sustainable goals of the government.

C. WebQuests and Multimedia Resources: Platforms like Teachers Pay Teachers provide materials where students explore various aspects of the national debt through videos, articles, and simulations. For instance, a comprehensive National Debt WebQuest guides students through interactive learning, beginning with educational videos and culminating in simulations aimed at reducing the budget deficit.[3]

D. Mathematical Modeling: Incorporating mathematics, students collect data on the national debt, plot it over time, and analyze trends to understand its growth. The National Council of Teachers of Mathematics provides lessons where students

[1] https://www.jfklibrary.org/learn/education/teachers/curricular-resources/federal-budget-simulation

[2] https://fte.org/teachers/teacher-resources/lesson-plans/making-sense-of-the-federal-budget-debt-deficits/lesson-1-our-national-debt/

[3] https://www.teacherspayteachers.com/Product/Growing-National-Debt-Engaging-Video-Article-Simulation-Web-Quest-for-Debt-4611668

determine if an exponential curve fits the national debt data, integrating mathematical concepts with real-world issues.[4]

E. Classroom Discussions and Debates: Engaging students in discussions about the causes and implications of the national debt encourages critical thinking. Resources like lesson plans from Study.com offer structured content to facilitate these conversations, helping students explore different perspectives on fiscal responsibility.[5]

These experiential learning activities aim to deepen students' understanding of the national debt, its implications for the economy, and the complexities involved in fiscal policy making. Our "pop" goes the national debt activity complements the aforementioned ideas in that it relies on visuals and data to create memorable moments that help students understand and retain the material. Providing a new activity to teach about the national debt is beneficial and particularly relevant given the size of the national debt and the current impasse over the debt ceiling.

3. The Lesson Plan

We use balloons to create a series of memorable moments which help students to learn about the National Debt. The lesson consists of three parts: an introductory section that provides visuals and data that are designed to bring the students up to date on the scope of the National Debt problem; the formal process you should follow when implementing the activity; and follow-up materials that spur a deeper discussion about the impact of the various debt paths.

3.1 Visuals and Data

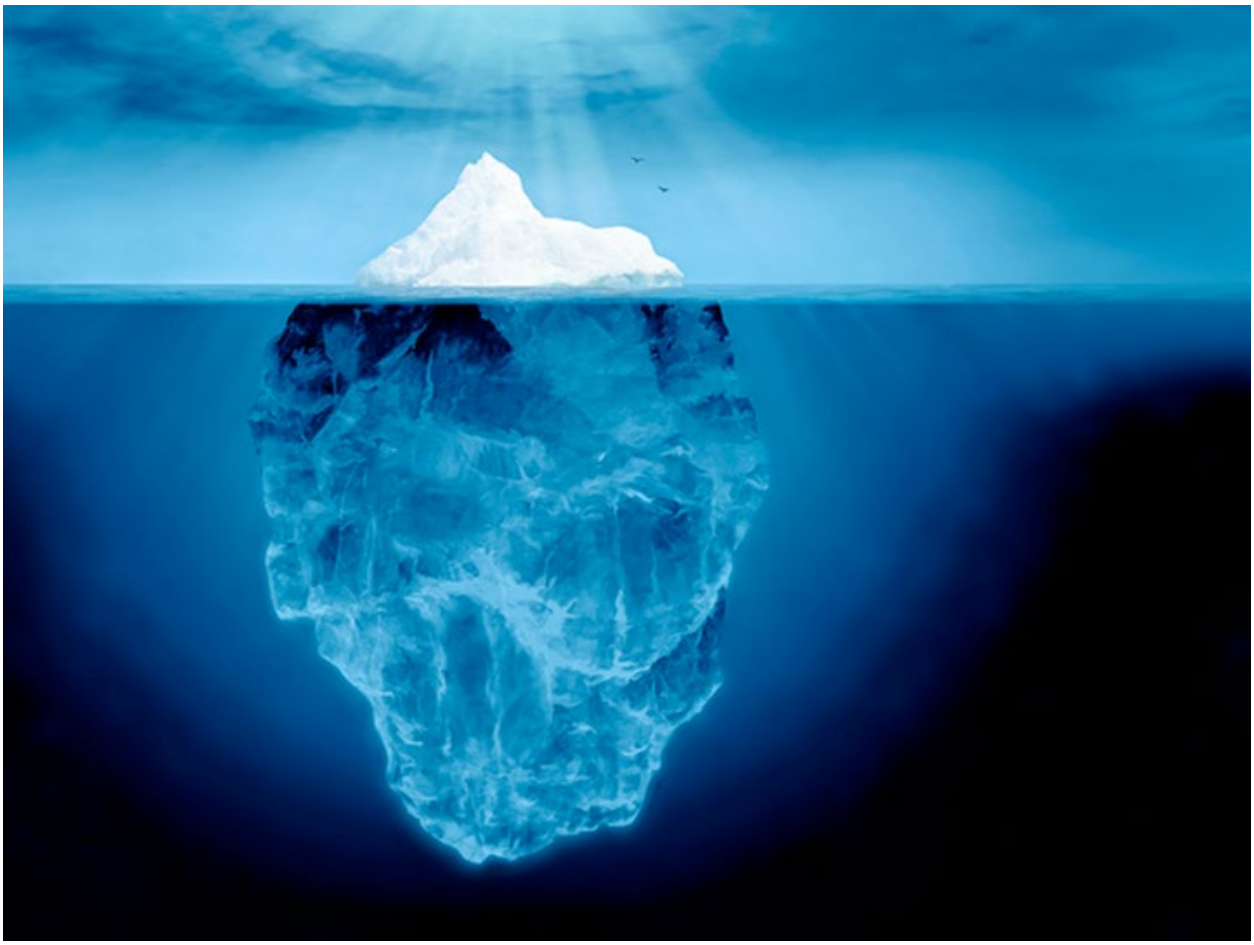
It is often said that a "picture is worth a thousand words". We agree with this sentiment and use images to visualize a complex problem. We suggest you start with this visual:

[4] https://www.nctm.org/Classroom-Resources/Illuminations/Lessons/National-Debt-and-Wars/

[5] https://study.com/academy/lesson/national-debt-lesson-plan.html

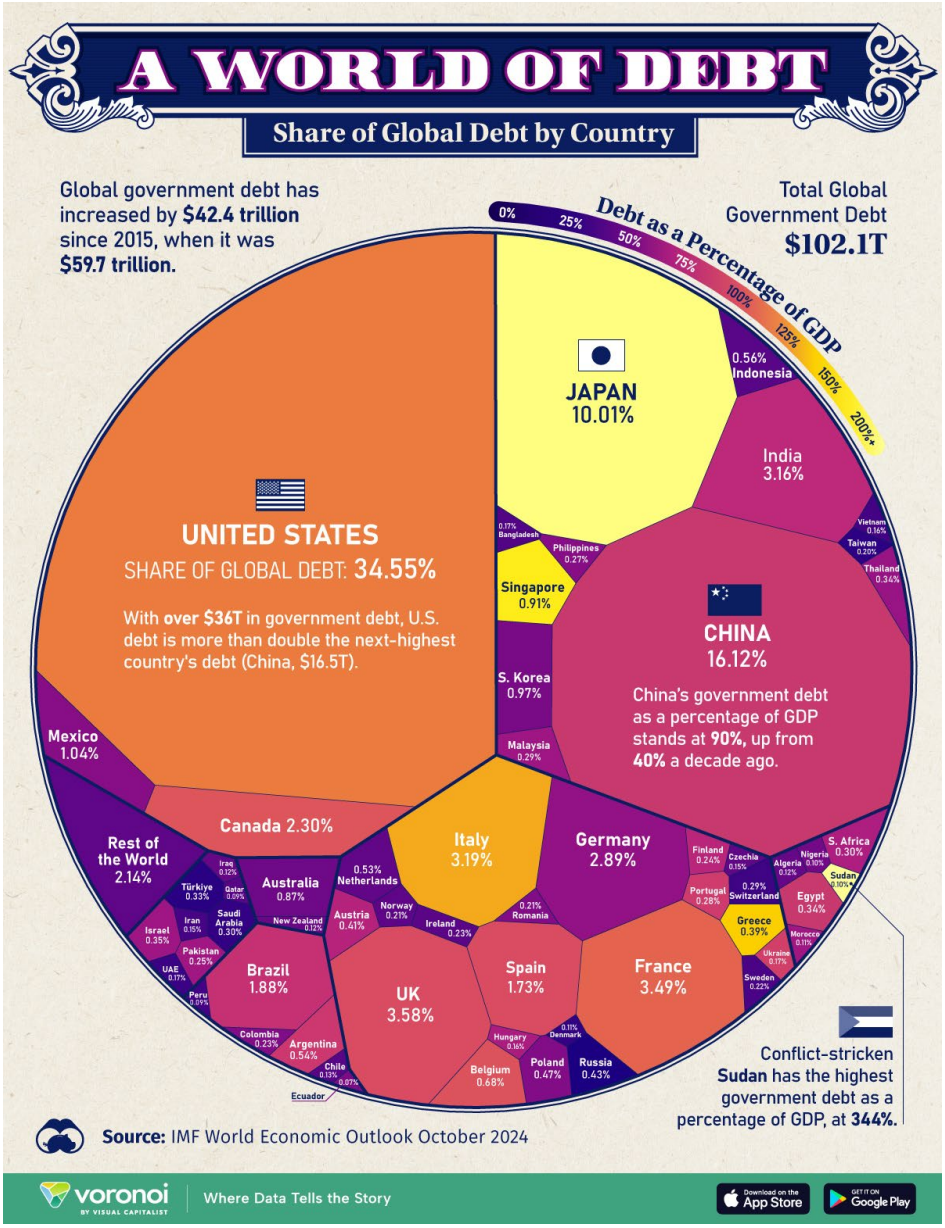
Here, we see that Congressional spending erupts like a volcano and the National Debt reaches far into the atmosphere. The comparison is apt as too much spending creates long reaching consequences into the future. At this point, you might wish to highlight that this metaphor ignores the distinction between mandatory programs and discretionary spending. Mandatory spending currently accounts for around 60% of the federal budget and covers programs like Social Security, Medicare, and Medicaid. These programs aren't just things lawmakers want to spend money on—they're written into law and would require bipartisan congress support to be changed. About 40% of the budget is discretionary spending. This is the easier part of the budget to adjust, but it's also much smaller than the amount spent on mandatory categories.

This second image speaks to the role that deficits play in adding to the National Debt.



In this visual, the deficit is the tip of the iceberg seen above the water line. We understand that icebergs are to be avoided. Deficits occur on an annual basis, but a deficit is only a tiny fraction of the problem. The debt is the volume of the entire iceberg. Think of the National Debt as the sum of all the deficits over many years. Since most of the debt lies under the water, it is both invisible and the most dangerous part of the iceberg.

Finally, we bring the debt debate full circle by providing a chart of global debt. In this visual we see that if the U.S. economy “pops” from too much debt that the event will not be a localized problem. The magnitude of the U.S. debt is so large that a default on our indebtedness would surely destabilize the world economy as well.



The point of all three visuals is to give students perspective, promote discussion, and prepare them for the activity, which follows.

Real life data is also a very powerful tool. Looking at data invites a larger conversation about the true nature of the problem. Let's check out a table from the U.S. Department of the Treasury:

Table 3. Summary of Receipts and Outlays of the U.S. Government, September 2024 and Other Periods

[$ millions]

Classification	This Month	Current Fiscal Year to Date	Comparable Prior Period Year to Date	Budget Estimates Full Fiscal Year[1]
Budget Receipts				
Individual Income Taxes	250,057	2,426,067	2,176,481	2,417,353
Corporation Income Taxes	108,555	529,867	419,584	609,500
Social Insurance and Retirement Receipts:				
Employment and General Retirement (Off-Budget)	106,197	1,259,883	1,193,755	1,259,058
Employment and General Retirement (On-Budget)	34,880	393,115	364,392	420,595
Unemployment Insurance	865	48,607	49,402	49,428
Other Retirement	710	7,954	6,904	7,619
Excise Taxes	12,296	101,435	75,804	89,233
Estate and Gift Taxes	2,204	31,616	33,668	32,478
Customs Duties	7,249	77,037	80,337	76,805
Miscellaneous Receipts	4,606	43,155	38,959	39,022
Total Receipts	**527,620**	**4,918,736**	**4,439,286**	**5,001,091**
(On-Budget)	**421,422**	**3,658,853**	**3,245,531**	**3,742,033**
(Off-Budget)	**106,197**	**1,259,883**	**1,193,755**	**1,259,058**
Budget Outlays				
Legislative Branch	682	6,835	6,512	7,553
Judicial Branch	879	9,480	8,995	9,783
Department of Agriculture	11,304	203,402	228,887	237,078
Department of Commerce	2,019	14,831	12,045	20,174
Department of Defense--Military Programs	72,312	826,277	775,872	817,778
Department of Education	17,814	268,353	-41,108	
Department of Energy	4,097	49,315	34,423	47,564
Department of Health and Human Services	102,758	1,720,621	1,708,521	1,727,400
Department of Homeland Security	9,248	89,290	89,032	121,943
Department of Housing and Urban Development	4,491	51,976	55,194	52,142
Department of the Interior	2,632	17,088	15,865	18,115
Department of Justice	4,457	43,995	44,327	44,075
Department of Labor	3,835	65,672	87,531	63,974
Department of State	5,824	37,017	32,997	37,704
Department of Transportation	16,954	117,389	109,523	117,238
Department of the Treasury:				
Interest on Treasury Debt Securities (Gross)	84,448	1,133,037	879,307	1,157,762
Other	-23,881	183,816	227,644	257,676
Department of Veterans Affairs	15,767	325,004	301,026	341,112
Corps of Engineers	1,110	11,345	7,806	
Other Defense Civil Programs	755	66,220	68,928	69,262
Environmental Protection Agency	1,848	13,699	12,586	11,888
Executive Office of the President	33	607	543	727
General Services Administration	-350	-244	-700	8
International Assistance Programs	5,545	35,794	36,050	42,195
National Aeronautics and Space Administration	2,093	25,015	25,319	25,826
National Science Foundation	1,015	9,392	8,951	9,987
Office of Personnel Management	10,378	126,173	122,508	128,803
Small Business Administration	205	33,197	26,072	33,157
Social Security Administration	124,465	1,519,734	1,416,328	1,520,079
Independent Agencies	-3,106	77,793	134,620	91,387
Allowances	.....	.....	.....	-1,901
Undistributed Offsetting Receipts:				
Interest	-4,682	-183,823	-169,144	-187,500
Other	-11,591	-146,749	-131,934	-145,890
Total Outlays	**463,357**	**6,751,552**	**6,134,526**	**6,874,608**
(On-Budget)	**340,361**	**5,431,240**	**4,913,425**	**5,559,018**

The Total Receipts for the Current Fiscal Year is $4.91 trillion and the Interest on the Treasury Debt Securities (Gross) is $1.13 trillion. Taking the Interest and dividing it by the receipts gives us 1.13T/4.91T = 22%. This means that interest payments on the National Debt is equivalent to 22% of the money the government received in 2024. If your class asks questions, or you have the time and inclination, a deeper dive is beneficial to understanding how the government functions.

Next, we compare the size of the U.S. National Debt with other countries by using debt-to-GDP ratios. This data from 2023 lists the ten countries with the highest debt-to-GDP ratios:

Country	Debt-to-GDP Ratio
Japan	264%
Venezuela	241%
Sudan	186%
Greece	173%
Singapore	168%
Eritrea	164%
Lebanon	151%
Italy	142%
United States	129%
Cape Verde	127%

The list includes highly successful countries and some of the poorest counties in the world. As you go through the list with your class, ask your students the following question: “Are you concerned that the United States is on this list?” Most students will respond: “Yes.” Ask them to explain why a high debt-to-GDP ratio is potentially a problem.

3.2 The Balloon Activity

A. Materials Needed:

- A balloon for each student. This activity works equally well in small and large classes. A roughly equal number of balloons in three different colors. We use blue, red, and yellow.
- A marker.

B. Time Needed: 15 minutes if you quickly cover sections 3.1 and 3.2. More realistically, 30 minutes is the norm. However, there is more than enough material to last 45 minutes if you include section 3.3 as well.

C. Instructor Illustration: Ask for two volunteers to help blow up two balloons. Have the first volunteer blow up one balloon and tie it up to illustrate the size of US GDP (currently $29 trillion). Using a second balloon, have the second volunteer blow this up so that the U.S. National Debt ($36 trillion) is approximately 22% larger than the GDP balloon. Have the volunteers tie up their balloons.

This visual works best when you mark “GDP” on the second balloon (BLUE) and “National Debt” (RED) on the first balloon.

D. Detailed Directions:

- Instruct each student to blow up their balloon halfway and hold it, but do not tie it off. Emphasize that as the debt grows, it becomes a greater concern.
- Next, have each student with a blue balloon stand up. Once they are all standing, have them continue to blow up their balloons one puff at a time. While all of the blue balloons continue to expand, start counting “2025, 2026, 2027, 2028, etc”, as the blue balloons begin to “pop” and continue until the last one pops. This process highlights that no one is exactly sure how long it takes for an economy’s debt to become so unsustainable that securities’ holders (people who buy/own U.S. government debt) flee en masse all at once. This is the economy “pops” scenario.
- Have each student with a yellow balloon stand up and tie off their balloons. As the students are busy tying off their balloons, remind them that the GDP balloon you showed them earlier will continue to grow over time. Therefore, the debt-to-GDP ratio will fall through time simply by reducing the size of future deficits, running balanced budgets or having budget surpluses in the future.
- Have each student with a red balloon stand up. Ask those standing on the left-hand side of the class to try to let the air out of their balloons slowly. This typically makes a whistle sound which is easy to hear. Note to the class that this reduces the debt-to-GDP ratio more quickly than simply tying off the balloons but requires harder political choices that entail running budget surpluses and is

contractionary. After all those balloons have shriveled up, ask the remaining student with yellow balloons on the right-hand side of the class to release their balloons up into the air. The balloons behave erratically and make a hissing sound. This is the scenario where the economy undergoes a depression-like crash.

3.3 Follow-up Materials

After the activity is complete, students will understand that there are two manageable solutions (tying off the debt; running smaller deficits in the future) and two catastrophic outcomes (the economy "pops"; the economy rapidly deflates). Your class is now primed to think about how policy makers can respond to the National Debt problem. In this section, we provide a series of questions and answers to help the instructor lead this discussion.

Questions and answers for further discussion:

1. Until early 2024, both Jerome Powell and Janet Yellen refused to acknowledge that the United States had a debt problem, instead stating that the debt was sustainable. Why do you think they waited so long to acknowledge the truth?

ANSWER: Janet Yellen was the Secretary of the Treasury, a politically appointed position in the Biden Administration. She was trying to divert attention away from the debt problem so Biden and the Democrats could more freely pursue their agenda. The Federal Reserve, which is viewed as apolitical, also took the same approach. Powell's motivations were slightly different, he was concerned that if he acknowledged the problem, his words would rattle markets. The Federal Reserve tries to achieve its dual mandates of low inflation and low unemployment through monetary policy and also by comforting investors that the economy is on sound footing.

2. How does a rising National Debt make our economic well-being less sustainable by suppressing the rate of growth necessary to maintain the debt-to-GDP ratio?

ANSWER: Economic growth occurs through capital investments in infrastructure, new technologies, and entrepreneurial ventures. When the government has a large debt-to-GDP ratio, funds that could be used to create better infrastructure, or provide more goods and services are instead tied up in debt servicing. There is an opportunity cost here that limits the growth rate of GDP.

3. The recently created Department of Government Efficiency (DOGE) has a mandate to reduce government waste. If DOGE trims $3 trillion from the Federal government's expenditures over the next ten years, will the National Debt decline by the same amount?

ANSWER: We don't know. Receipts and expenditures are not tied together. It is entirely possible the National Debt could continue to grow if expenditures continue to exceed receipts. One thing is sure though, the National Debt would be $3 trillion lower than it might otherwise have been – that's a good outcome.

4. For too long our leaders told us "sustainable debt" was fine. What are policies that create more human flourishing in the long run?

ANSWER: Policies that promote economic growth can help to address the debt problem. Some examples are dynamic education reforms, the development of new technologies, investing in health procedures (and prevention) that extend longevity. In addition, fewer business regulations and lower business taxes will stimulate more investment in the economy. We owe it to ourselves and future generations to reduce our $36 trillion-dollar debt.

5. What's the simplest political solution to the National Debt problem that is politically feasible?

ANSWER: While DOGE is well intentioned, it is almost impossible to imagine that DOGE can find enough savings to offset the $1.7 trillion federal deficit from 2023 from the 40% of the Federal budget that is considered discretionary spending. If we are politically practical, we would recognize the systemic bias among politicians towards deficits. This is why reducing the rate of growth in future deficits and therefore the growth rate of the National Debt is the easiest path to reducing the debt-to-GDP ratio. This path will very slowly reduce the debt-to-GDP ratio as long as the economy grows faster than the National Debt.

4. Conclusion

The rising national debt is one of the most critical issues facing American consumers, the business community and politicians, both today and for generations into the future. Understanding the perils of a large national debt, which currently stands at $36 trillion, is paramount before an effective solution can be found. Instructors can accommodate this need for greater financial literacy by introducing innovative ways to teach students about national debt. "Pop" goes the national debt is an experiential learning activity which aims to deepen students' understanding of the national debt, its implications for the economy, and the complexities involved in fiscal policy making.

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