The Economic Impact of the E-Rate Program

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Executive Summary

The Federal Communications Commission is considering eliminating or significantly reducing E-Rate support ($2.6 billion in 2025) for broadband connectivity and related services provided to schools and libraries. While eliminating the program would reduce Universal Service Fund expenditures, it would also increase the effective cost of broadband services for public and private K-12 schools and libraries that increasingly rely on digital connectivity to support teaching, learning, school operations and security, cybersecurity, internal and external communications, and access to online educational and informational resources. Nearly every critical function in schools and libraries now relies on the network, including door locks and access controls, security cameras, bus scheduling and transportation systems, cafeteria payment systems, payroll, student information systems, attendance and grading platforms, and communications with students, staff, and families. Because broadband has become an essential educational input rather than a discretionary expenditure, schools and libraries cannot simply replace connectivity with teachers, books, buildings, or other educational resources. Paying more for connectivity therefore leaves less money available for the other goods and services needed to provide education and library services.

We use Brattle's BEYOND computable general equilibrium ("CGE") model to estimate the economy-wide contribution of E-Rate. Our primary counterfactual eliminates the program while recognizing that broadband and internal network infrastructure remain necessary inputs. The results indicate that eliminating approximately $2.6 billion in annual E-Rate support would reduce real GDP by approximately $4.2 billion annually, real wages by $2.8 billion, and tax revenues by approximately $1.5 billion. Thus, each dollar of E-Rate support is associated with approximately $1.60 in GDP. The measured economic loss exceeds the amount of federal support removed because without E-Rate, schools and libraries must devote more of their own budgets to connectivity, leaving less available to support the overall level of education and library services. As school spending generates greater follow-on economic activity than broadband spending, institutions purchase fewer non-broadband goods and services from other suppliers and use less labor, and those reductions propagate through household income, spending, and tax revenues.

Eliminating just support for connectivity infrastructure (Category 2), including routers, switches, Wi-Fi access points, cabling, managed internal broadband, and related infrastructure needed to

distribute connectivity within schools and libraries, would also have substantial effects. Eliminating Category 2 alone (approximately $1.2 billion in annual support) produces an estimated $2.5 billion decline in GDP, $1.6 billion reduction in real wages, and $0.9 billion reduction in tax revenues.

Finally, we find that even unsubstantiated concerns about waste, fraud, inefficient procurement, or otherwise unproductive expenditures do not materially change these conclusions. Even under a deliberately conservative assumption that 2.5% of E-Rate support generates no intended economic benefit given that the improper payment level has already been found to be lower than 1.5%,[1] the associated GDP loss is approximately $113.9 million, or only about 2.7% of the GDP loss from eliminating E-Rate altogether. The results demonstrate that eliminating a productive program to prevent a comparatively small amount of ineffective spending can impose economic costs substantially greater than the inefficiency being addressed.

The FCC's review should therefore distinguish between monetary savings and economic benefits. The fact that most schools and libraries are now connected does not eliminate the market failure E-Rate addresses. Availability of broadband is different from the ability to finance the level of connectivity and internal infrastructure required for modern education. Our results indicate that E-Rate generates economic benefits substantially exceeding its cost and that significant reductions in the program would impose costs on schools, libraries, workers, taxpayers, and the broader U.S. economy.

Importantly, reducing E-Rate expenditures should not be equated with an equivalent saving to taxpayers. Because E-Rate is financed through USF contributions rather than general federal revenues, reducing the program lowers the amount collected through the USF mechanism. Concerns about whether the existing USF contribution base remains efficient and sustainable are important, but they are analytically distinct from whether E-Rate itself generates economic value.

There may be broader market failures in education that lead to underinvestment in educational resources generally. The FCC, however, is charged with communications policy rather than education policy. Within that mandate, E-Rate allows the FCC to address one specific dimension of the broader underinvestment problem – inadequate investment in communications and broadband infrastructure. Thus, even if E-Rate cannot correct all of the market failures affecting

[1] *See*, IG finding on improper payment threshold. FCC, "Inspector General's Top Management and Performance Challenges for FY 2025 for the Federal Communications Commission," October 29, 2024, https://www.fcc.gov/sites/default/files/fy25_fcc_tmpc_mngt-response_10292024.pdf.

educational investment, it can help ensure that underinvestment in connectivity does not further constrain the production of educational services.

I. Introduction

Affordable, high-speed broadband connectivity has become a fundamental input into modern education and libraries. Digital learning platforms, cloud-based instructional resources, online assessments, cybersecurity systems, administrative operations, and communication with students, parents, library patrons, and the public all depend on reliable broadband connectivity. As schools and libraries have integrated digital technologies within nearly all aspects of their educational and library services including but not limited to teaching and learning, providing services to library patrons, and all other aspects of essential operations such as security (doors, locks, security cameras), HVAC systems, transportation routing, lunch programs access to affordable, high-capacity broadband is a fundamental necessity prerequisite for delivering educational services effectively and universally.

Recognizing the growing importance of educational connectivity, Congress established the Schools and Libraries Universal Service Support Mechanism, commonly known as the E-Rate program, as part of the Telecommunications Act of 1996.[2] Administered by the Federal Communications Commission ("FCC"), E-Rate provides discounts on broadband services, internal network infrastructure, Wi-Fi equipment, and related communications services to eligible schools and libraries.[3] Today, E-Rate supports connectivity for tens of thousands of schools and libraries serving millions of students throughout the United States. By reducing the cost of broadband services, the program seeks to ensure that educational institutions, particularly those serving lower-income communities whether in rural or urban areas, can provide students and educators with access to the digital resources necessary for modern learning.

Although E-Rate was initially conceived as a mechanism to expand Internet access in schools and libraries, its role has evolved alongside technological change.[4] Broadband underpins virtually every aspect of educational delivery, including learning management systems; video instruction; standardized testing; cloud computing; cybersecurity, digital textbooks, e-books,

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2 FCC, "Universal Service: Schools & Libraries," last accessed August 13, 2026, https://www.fcc.gov/general/universal-service-schools-libraries, ("Universal Service: Schools & Libraries").

3 Universal Service: Schools & Libraries.

4 FCC, "In the Matter of Addressing the Homework Gap through E-Rate Program," Report and Order and Further Notice of Proposed Rulemaking, WC Docket No. 21-31, Released July 29, 2024, https://docs.fcc.gov/public/attachments/FCC-24-76A1.pdf.

and databases; special education services; basic building operations including security and HVAC, library reference and databases;, and communication with parents, administrators, and library patrons. The expansion of digital learning has accelerated this transformation and demonstrated the extent to which educational continuity depends on reliable broadband connectivity. Public libraries also serve as critical community connectivity hubs, providing broadband access to individuals who may lack reliable or affordable service at home and enabling access to education, employment, healthcare, government services, and other essential digital resources. Broadband connectivity represents one of the key enabling technologies through which these educational benefits are realized. Consequently, evaluating the E-Rate program solely on the basis of its direct expenditures risks understating its overall economic contribution. Numerous studies have shown that educational attainment contributes to higher lifetime earnings, increased labor productivity, greater workforce participation, and stronger long-run economic growth.[5] Investments that improve educational outcomes therefore generate benefits that extend beyond students, schools, and libraries to employers, taxpayers, and the broader economy.

Recent policy discussions have questioned whether the FCC should continue supporting broadband connectivity through the E-Rate program.[6] Proposals to eliminate or substantially reduce E-Rate funding are in part evaluated in terms of the resulting reduction in Universal Service Fund ("USF") expenditures.[7] However, this perspective overlooks how schools and libraries are likely to respond if broadband subsidies are withdrawn. Broadband is not, and cannot, be viewed as a discretionary expenditure. Schools and libraries cannot simply discontinue Internet service without disrupting instruction, online assessments, student information systems, cybersecurity protections, building security, collection management, database and research access, bus scheduling, cafeteria electronic payment system and numerous administrative functions, including payroll. Consequently, the elimination of E-Rate is unlikely to result in a proportional reduction in broadband consumption. Instead, many schools

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5 Tamborini, Christopher R., Chang Hwan Kim, and Arthur Sakamoto, "Education and Lifetime Earnings in the United States," *Demography* (2015), 52: 1383–1407, https://pmc.ncbi.nlm.nih.gov/articles/PMC4534330/, ("Education and Lifetime Earnings in the United States"). *See also,* Hanushek, Eric A., Woessmann, Ludger, "Education and Economic Growth," International Encyclopedia of Education, 2010:60-67, https://hanushek.stanford.edu/publications/education-and-economic-growth, ("Education and Economic Growth").

6 FCC, "In the Matter of Ensuring Children's Safe Use of Screens and E-Rate-Funded Services; Modernizing the E-Rate Program for Schools and Libraries; Establishing the Emergency Connectivity Fund to Close the Homework Gap; Promoting Fair and Open Competitive Bidding in the E-Rate Program," Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking, WC Docket No. 26-133, Released June 26, 2026, https://docs.fcc.gov/public/attachments/FCC-26-41A1.pdf, ("2026 NPRM and FNPRM").

7 2026 NPRM and FNPRM.

and libraries would be forced to reallocate limited financial resources away from other educational priorities to maintain broadband services. The relevant economic question is therefore not simply how much would save be "saved" by eliminating E-Rate,[8] but rather how those savings would be offset by reduced educational investments and their broader economic consequences.

This paper develops a comprehensive economic assessment of the E-Rate program using Brattle's BEYOND computable general equilibrium ("CGE") model. Unlike traditional fiscal analyses that measure only the direct budgetary effects of program expenditures, a CGE framework captures the interactions among households, firms, government, labor markets, and production sectors to estimate the broader macroeconomic consequences of changes in educational broadband investment. The model quantifies changes in gross domestic product ("GDP"), employment, labor income, household welfare, industry output, and tax revenues arising from alternative E-Rate policies.

The analysis evaluates three policy scenarios and the national, regional and state level.

- First, at the national, regional, and state level, we estimate the economic loss that occurs if E-Rate support is eliminated. We treat broadband and internal network infrastructure as essential inputs that must be used alongside teachers, buildings, instructional materials, and other resources; they cannot simply be replaced by those other inputs. When E-Rate support is removed, schools and libraries must pay more of the connectivity cost from their own budgets. Because those budgets are limited, they can support a lower overall level of education and library services, and their demand for the other inputs used to provide those services also falls. The model traces those effects through suppliers, labor markets, household income, spending, and tax revenue.
- Second, at the national and regional level it estimates the economic loss that will occur if just the Category 2 E-Rate support is eliminated and schools and libraries respond to the price shock. The underlying assumptions are the same as the base model where all E-Rate funding is eliminated.
- Third, at the national level we estimate a scenario where we retain the full E-Rate program support but assume that 2.5% of both Category 1 and Category 2 support fails to generate the economic benefit that the funding is intended to produce. This scenario is not intended to represent estimates of the actual level of fraud or waste in E-Rate. Rather, this provides

[8] E-Rate is funded through the Universal Service Fund (USF), which is financed by contributions from telecommunications providers based on their interstate and international telecommunications revenues. Therefore the "savings" will reduce these contributions.

sensitivity tests that allow us to evaluate how much program inefficiency could be tolerated before materially reducing E-Rate's estimated net economic benefits.

II. Policy Background: E-Rate as a Solution to Market Failure

A. The E-Rate Program and Market Failure

The economic rationale for public investment in educational broadband extends well beyond ensuring that schools and libraries have Internet access. From the perspective of welfare economics, broadband connectivity in educational institutions exhibits several characteristics associated with market failure, resulting in private investment levels that are lower than what would maximize overall social welfare.[9] The E-Rate program addresses these market failures by reducing the cost of broadband connectivity for schools and libraries and encouraging investments whose benefits extend well beyond the institutions that receive support.[10]

An important market failure is the existence of positive externalities. Schools and libraries make decisions regarding broadband investments based primarily on their own budgets and operational needs. However, the benefits generated by educational connectivity extend well beyond the schools and libraries themselves.[11] Students who receive a high-quality digital education are more likely to acquire the technological skills that translate into higher lifetime earnings, increased labor productivity, greater innovation, and higher tax revenues. A similar argument can be made for libraries and the under-connected citizens of the communities they serve. Public libraries serve as critical community connectivity hubs, providing broadband access to individuals who may lack reliable or affordable service at home and enabling access to

[9] Welfare economics is the branch of economics concerned with how the allocation of resources affects social well-being and with the conditions under which markets produce economically efficient outcomes. Market failure arises when those conditions do not hold and decentralized market decisions therefore fail to produce the socially efficient allocation of resources. Externalities (positive and negative) are a canonical example. When an activity generates benefits for people who do not pay for them (positive externality), the decision-maker considers the private benefit but not the full social benefit of the activity. The result is underinvestment relative to the socially efficient level.

[10] Austan Goolsbee and Jonathan Guryan, "The Impact of Internet subsidies in Public Schools," National Bureau of Economic Research, August 2002, https://www.nber.org/papers/w9090, ("The Impact of Internet subsidies in Public Schools").

[11] *See, for e.g.,* Education and Economic Growth; Education and Lifetime Earnings in the United States.

education, employment, healthcare, government services, and other essential digital resources. Additionally, employers benefit from a more digitally literate workforce, while society benefits from a more productive economy. Investments in connectivity contribute not only to improved educational outcomes but also to the long-term accumulation of human capital.[12]

Educational institutions also face considerable uncertainty regarding future technology needs.[13] Because schools and libraries must make infrastructure investments under considerable uncertainty regarding future demand, private investment may lag the socially optimal level of broadband capacity. Because schools and libraries cannot capture these broader economic returns and appropriately internalize the risks, they have an incentive to invest less in broadband than is socially optimal. Public support through E-Rate helps narrow the gap between privately optimal and socially optimal investment. Public support remedies these market failures.

Congress recognized the growing importance of advanced telecommunications services for education when it enacted the Telecommunications Act of 1996.[14] Section 254 of the Act directed the FCC to establish mechanisms to preserve and advance universal service, explicitly identifying schools and libraries as institutions that should have access to advanced telecommunications and information services.[15] The underlying objective is not merely to increase Internet access, but to enable schools and libraries to acquire the communications infrastructure necessary to support modern education and digital learning.[16]

Since its inception, the E-Rate program has evolved alongside technological change. By 2010, approximately 95 percent of E-Rate participants already had terrestrial broadband connectivity, although nearly 80 percent reported that their existing connections did not fully meet their

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[12] Jeff Falk, "Internet-access Spending Improves Academic Outcomes, Study of Texas Schools Finds," Rice News, March 15, 2021, https://news.rice.edu/news/2021/internet-access-spending-improves-academic-outcomes-study-texas-schools-finds.

[13] Steve Joordens, Irameet Kaur, "Re-imagining Education for an Uncertain Future: Can Technology Help Us Become More Human?" Advanced Learning Technologies Lab, last accessed August 13, 2026, https://ecampusontario.pressbooks.pub/futureofhighereducation/chapter/re-imagining-education-for-an-uncertain-future-can-technology-help-us-become-more-human/.

[14] FCC, "Telecommunications Act of 1996," last accessed August 13, 2026, https://www.fcc.gov/general/telecommunications-act-1996.

[15] Legal Information Institute, "47 U.S. Code § 254," last accessed August 13, 2026, https://www.law.cornell.edu/uscode/text/47/254, ("47 U.S. Code § 254").

[16] 47 U.S. Code § 254.

educational needs.[17] Cost remained a significant barrier, with 39 percent of respondents identifying broadband service costs and 27 percent identifying installation costs as limiting factors in expanding connectivity.[18] A seminal paper by Goolsbee and Guryan, evaluated the early effects of the E-Rate program (1996 – 2000) and found that E-Rate substantially increased Internet investment in public schools. By the end of the sample period, the authors estimate that there were about 66% more Internet-connected classrooms than there would have been in the absence of the subsidy.[19]

As educational technology increasingly shifted toward broadband-intensive applications, the FCC expanded the program to support higher-capacity broadband services and modern internal network infrastructure. A major milestone occurred in 2014 with the adoption of the E-Rate Modernization Orders, which redirected support toward high-speed broadband connectivity and internal Wi-Fi networks while phasing down support for legacy voice services.[20] The Orders also established the current two-category funding structure that remains in place today.

- Category 1[21] supports broadband services that connect schools and libraries to the Internet, including internet access, data transmission services, etc. and certain special construction costs associated with deploying broadband infrastructure. These services provide the external connectivity necessary to bring broadband to each educational institution. For Funding Year 2025, the FCC reported approximately $1.55 billion in Category 1 disbursed funds.[22]

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17 FCC, "2010 E-Rate Program and Broadband Usage Survey: Report," DA 10-2414, https://docs.fcc.gov/public/attachments/DA-10-2414A1.pdf, ("2010 E-Rate Program and Broadband Usage Survey: Report").

18 2010 E-Rate Program and Broadband Usage Survey: Report.

19 The Impact of Internet subsidies in Public Schools.

20 FCC, "In the Matter of Modernizing the E-rate Program for Schools and Libraries," Report and Order and Further Notice of Proposed Rulemaking, WC Docket No. 13-184, Released July 23, 2014, https://docs.fcc.gov/public/attachments/FCC-14-99A1.pdf.

21 FCC, "In the Matter of Modernizing the E-rate Program for Schools and Libraries," Report and Order and Further Notice of Proposed Rulemaking, WC Docket No. 13-184, Released July 23, 2014, https://docs.fcc.gov/public/attachments/FCC-14-99A1.pdf, Appendix A.

22 FCC, "Wireline Competition Bureau Directs USAC to Fully Fund Eligible Category One and Category Two E-Rate Requests," CC Docket No. 02-6, Released May 20, 2025, https://www.fundsforlearning.com/wp-content/uploads/2025/05/USAC-to-Fully-Fund-Eligible-Category-One-and-Two-E-rate-Requests.pdf, ("Wireline Competition Bureau Directs USAC to Fully Fund Eligible Category One and Category Two E-Rate Requests").

- Category 2[23] supports the internal broadband infrastructure required to distribute connectivity throughout schools and libraries, such as wireless access points, routers, switches, internal cabling, network electronics, etc. and services, and maintenance necessary to operate these networks. Whereas Category 1 funds connectivity *to* the school, Category 2 funds the infrastructure that delivers broadband *within* the school. For Funding Year 2025, the FCC reported approximately $1.05 billion in Category 2 disbursed funds.[24]

B. The Continuing Need for E-Rate Support

Today, this support is particularly important because broadband has become an essential production input for education rather than a discretionary technology purchase, and schools and libraries are budget constrained. Eliminating E-Rate without providing replacement support or a significant increase in school and library funding would further constrain already-strained school budgets, resulting in reduced educational spending and a lower overall welfare outcome.

Modern schools and libraries rely on broadband to support classroom instruction, cloud-based educational platforms, online assessments, cybersecurity, administrative and building operations, student information systems, and communication with parents and communities. E-Rate reduces the share of these connectivity costs that institutions must pay from their own budgets. Without that support, the same connectivity needs consume a larger share of available budgets, leaving less money for the other goods and services needed to provide education. In the model, this appears as lower education-sector output. For a broadly unchanged student population, that decline is best understood as a reduction in the quantity or intensity of education services provided per student, not as higher tuition, fewer students, or a direct estimate of learning outcomes. Lower education activity also means less demand for labor and for the suppliers that serve schools, which is one channel through which the effect spreads to the broader economy.

E-Rate addresses affordability through both subsidies and price protections. The program discounts the cost of eligible connectivity for schools and libraries, while its Lowest Corresponding Price ("LCP") rule generally prevents participating providers from charging them

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[23] FCC, "In the Matter of Modernizing the E-rate Program for Schools and Libraries," Report and Order and Further Notice of Proposed Rulemaking, WC Docket No. 13-184, Released July 23, 2014, https://docs.fcc.gov/public/attachments/FCC-14-99A1.pdf, Appendix A.

[24] Wireline Competition Bureau Directs USAC to Fully Fund Eligible Category One and Category Two E-Rate Requests.

more than the lowest price offered to similarly situated non-residential customers for comparable services.[25] Thus, E-Rate has two effects on affordability of educational broadband. On one hand it reduces the portion of the bill paid by schools and libraries, easing some of the budget constraint faced by schools. On the other hand, it disciplines the underlying prices against which those discounts are applied. If E-Rate support were eliminated, schools and libraries would lose the subsidy that directly lowers their connectivity costs and, to the extent providers and services were no longer subject to E-Rate requirements, could also lose the LCP protection associated with the program. In that circumstance, schools and libraries, particularly those with limited competitive alternatives, could face both a substantially larger share of connectivity costs and less protection against higher underlying prices. Our paper focuses only on the effect of changing the direct E-Rate support and does not model the potential for raised connectivity costs through potential price increases. As such, our modeled effects of E-Rate support elimination can be interpreted as lower bounds.

Academic literature further shows that broadband connectivity is an essential educational input rather than simply another technology expenditure.[26] Researchers have shown that improvements in broadband procurement and network investment substantially reduce connectivity costs while dramatically increasing available bandwidth, allowing schools to expand digital learning opportunities without proportionate increases in spending.[27] More generally, analysts have argued that broadband infrastructure should be viewed as part of the educational production function because it supports instructional delivery, student engagement, administrative efficiency, and long-term human capital development.[28]

Additionally, broadband spending by schools and libraries also exhibits important network externalities.[29] Network externalities arise when the value of a good or service increases as more users start consuming it. This implies that the value of broadband connectivity increases

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[25] 2026 NPRM and FNPRM.

[26] See, e.g., Mattia Caldarulo, Karen Mossberger, Anthony Howell, "Community-wide broadband adoption and student academic achievement," *Telecommunications Policy*, February, 2023, https://www.sciencedirect.com/science/article/abs/pii/S0308596122001471; Cole Campbell, "Need for Speed: Broadband and Student Achievement," July 29, 2022, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4176256.

[27] Gaurab Aryal, Pallavi Pal, Charles Murry, Arnab Palit, "The Benefits from Bundling Demand in K-12 Broadband Procurement," *American Economic Journal,* https://www.aeaweb.org/articles?from=f&id=10.1257%2Fmic.20250039.

[28] Rosa Sanchis-Guarner, "Broadband as human capital infrastructure," London School of Economics, March 19, 2026, https://blogs.lse.ac.uk/politicsandpolicy/broadband-as-human-capital-infrastructure/.

[29] Lauren H. Mandel, et al., "Broadband for Public Libraries: Importance, Issue, and Research Needs," Government Information Quarterly, July 2010, https://www.sciencedirect.com/science/article/abs/pii/S0740624X10000250.

as more students, educators, library patrons, educational institutions, government agencies, and digital service providers become connected. Connecting a school or library can create benefits beyond that institution by expanding the network through which students, educators, families, libraries, government agencies, and digital-service providers interact and exchange information. Because an individual school or library does not capture all of these broader benefits when making its own broadband investment decisions, private investment may fall below the socially efficient level. These network effects can further increase the social returns to broadband investment relative to the private returns perceived by individual schools and libraries.

It is worth noting that the widespread availability of broadband does not imply that the need for investment in educational connectivity has ended. Connectivity is not a one-time infrastructure achievement: the capacity required by schools and libraries has increased as educational technology has evolved from basic Internet access to cloud computing, video instruction, online assessments, cybersecurity, one-to-one devices, and, increasingly, artificial intelligence. The FCC has recognized this dynamic explicitly in setting progressively higher connectivity goals for schools, moving from a benchmark of 100 Mbps per 1,000 students toward a longer-term goal of 1 Gbps per 1,000 students. The growth of AI is likely to increase these demands further. AI-enabled tutoring, adaptive learning, real-time translation and accessibility tools, generative educational applications, and increasingly cloud-based administrative systems require reliable, low-latency, high-capacity networks and robust internal Wi-Fi infrastructure. The U.S. Department of Education has similarly identified AI as an increasingly important educational technology while emphasizing that universal access to the underlying technology and infrastructure is necessary if its benefits are to be broadly shared.

Thus, a school being "connected" does not imply that additional connectivity investment has no value, just as universal access to electricity did not eliminate the need to expand electrical capacity as new uses emerged. The relevant economic question is whether network capacity keeps pace with the applications that students and educators increasingly rely upon. This issue is particularly consequential for AI because inadequate connectivity could create a new dimension of the digital divide: schools with sufficient resources can upgrade networks and adopt bandwidth-intensive AI applications, while schools facing tighter budgets may be unable to do so. Reducing E-Rate because most schools have achieved basic connectivity could therefore confuse achievement of an earlier policy objective with elimination of the underlying need for investment. In an AI-intensive economy, maintaining and upgrading school and library networks is better understood as continued investment in human-capital infrastructure –

infrastructure that allows students to acquire and use the technologies increasingly shaping higher education and the labor market.

A central objective of E-Rate is to make high-quality connectivity affordable for schools and libraries, rather than simply ensuring that broadband infrastructure is technically available. E-Rate accomplishes this by providing discounts on eligible broadband and network services, thereby reducing the price that schools and libraries must pay from their own budgets. The discount ranges from 20 percent to 90 percent, with higher discounts generally available to schools and libraries serving higher shares of low-income students or their rural status. By requiring recipients to pay the remaining share, the program preserves incentives for cost-conscious purchasing while substantially reducing affordability barriers. Thus, the E-Rate discount mechanism is fundamental to the program. It translates the availability of broadband services into connectivity that schools and libraries can actually afford to purchase and sustain.

C. Current FCC Review

The FCC's current Notice of Proposed Rulemaking ("NPRM") "Ensuring Children's Safe Use of Screens and E-Rate-Funded Services", represents the most comprehensive review of the E-Rate program in more than a decade, and seeks comment on additional rules governing how schools and libraries use services supported by E-Rate and related programs.[30] Although the Commission states that it is seeking comment on a broad range of policy issues rather than proposing a predetermined outcome, several questions raised in the NPRM could substantially reduce the scope of E-Rate support. Most notably, the Commission asks whether the E-Rate program should continue indefinitely given the substantial expansion of broadband availability since its creation in 1996. Specifically, the NPRM seeks comment on whether "the E-Rate program should be limited or sunset to reflect today's extensive connectivity rates" and asks "at what point should policymakers conclude that the program's core objective has been achieved."[31] The Commission also asks whether Congress intended E-Rate to operate indefinitely once schools and libraries had largely achieved broadband connectivity. Additionally, it also questions whether E-Rate should be limited to rural areas. These questions go beyond program administration and directly raise the possibility of scaling back or eventually eliminating E-Rate support. The NPRM also includes questions about whether support should continue for internal connections, managed internal broadband services, and other Category 2

[30] 2026 NPRM and FNPRM for Ensuring Children's Safe Use of Screens and E-Rate Funded Services.

[31] 2026 NPRM and FNPRM for Ensuring Children's Safe Use of Screens and E-Rate Funded Services.

expenditures, or whether E-Rate should focus more narrowly on the external broadband connection itself.

Another major development is the FCC's April 2026 Report and Order on competitive bidding.[32] The Order focuses on program integrity rather than reducing the substantive categories of E-Rate support.[33] The FCC states that the objective is to create greater transparency in procurement, reduce improper payments, and strengthen safeguards against waste, fraud, and abuse.

III. Framing the Economic Question and Estimation Methodology

A. Understanding the Implications Stemming from the FCC's Proposal

The current FCC proceeding raises questions not only about how E-Rate should be administered, but also about the appropriate scope and level of support provided through the program.[34] As explained above, the Commission seeks comment on whether the range of eligible services should be narrowed, whether existing funding mechanisms and budgets should be revised, and whether support should be more closely limited to core connectivity. These proposals could materially reduce the subsidy received by schools and libraries even if parts of the E-Rate program itself remains in place. Economically, a reduction in E-Rate acts like an increase in the amount schools and libraries must pay themselves for broadband and network infrastructure. Because these are necessary inputs used alongside teachers, buildings, instructional materials, and other resources, higher out-of-pocket connectivity costs leave less budget available to support the overall level of education and library services.

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[32] FCC, "In the Matter of Promoting Fair and Open Competitive Bidding in the E-Rate Program," Report and Order and Order on Reconsideration, WC Docket No. 21-455, Adopted April 30, 2026, https://docs.fcc.gov/public/attachments/FCC-26-30A1.pdf.

[33] FCC, "In the Matter of Promoting Fair and Open Competitive Bidding in the E-Rate Program," Report and Order and Order on Reconsideration, WC Docket No. 21-455, Adopted April 30, 2026, https://docs.fcc.gov/public/attachments/FCC-26-30A1.pdf.

[34] 2026 NPRM and FNPRM for Ensuring Children's Safe Use of Screens and E-Rate Funded Services.

The FCC's current NPRM implicitly asks whether these market failures continue to justify federal intervention. In particular, the Commission seeks comment on whether the E-Rate program should continue indefinitely given the substantial increase in broadband availability since the program's creation and whether the program's scope should be narrowed or otherwise modified. These questions assume that because broadband infrastructure has become more widely available, the original justification for E-Rate may have diminished. However, from an economic perspective, increased broadband availability does not necessarily eliminate the underlying market failures.

Availability addresses only the supply of broadband infrastructure. The central issue addressed by E-Rate concerns the budget constraint faced by schools, the incentives schools and libraries face when deciding how much to invest in broadband and digital infrastructure relative to competing educational priorities and the private and social optimum amount that should be spent. Similar to the broader education spending, by lowering the effective cost of broadband connectivity, E-Rate encourages investments whose social returns exceed their private returns. The program therefore functions not simply as a transfer payment but as a corrective policy designed to reduce the gap between a constrained sub-optimal choice and between privately and socially optimal investment in educational broadband infrastructure.

There may be broader market failures in education that lead to underinvestment in educational resources generally. The FCC, however, is charged with communications policy rather than education policy. Within that mandate, E-Rate allows the FCC to address one specific dimension of the broader underinvestment problem – inadequate investment in communications and broadband infrastructure. Thus, even if E-Rate cannot correct all the market failures affecting educational investment, it can help ensure that underinvestment in connectivity does not further constrain the production of educational services.

To understand the implications of the FCC’s proposals, we first model broadband and internal network infrastructure as essential educational inputs that cannot simply be replaced with other major education inputs. When E-Rate funding is reduced, schools and libraries must devote more of their own budgets to connectivity, which reduces the overall level of education and library services they can support and, in turn, their demand for other inputs. We then model a second scenario in which Category 2 support is eliminated. These scenarios allow us to estimate both the direct effect on educational activity and the broader economy-wide effects that follow from lower demand for labor, suppliers, household spending, and other activity.

B. Methodology

The analysis uses BEYOND, Brattle's computable general equilibrium model of the U.S. economy. A CGE framework represents households, firms, government, labor, capital and product markets as an interdependent system, so a change in E-Rate support can affect more than the schools and libraries receiving the subsidy. In practical terms, when institutions must devote more of their budgets to connectivity, the overall level of education activity falls and they purchase less from other suppliers and use less labor. Those suppliers and workers then experience lower income and spending, creating additional effects elsewhere in the economy. BEYOND captures these feedbacks through changes in prices, wages, sectoral output, consumption, and tax revenues as the economy adjusts to a new equilibrium.

The primary analysis compares the base equilibrium, which includes school and library E-Rate support, with a No E-Rate support counterfactual in which that support is removed. Broadband and internal network infrastructure remain necessary inputs, so schools and libraries cannot simply substitute away from connectivity when its effective cost rises. Instead, the higher amount they must pay from their own budgets reduces the overall level of education and library activity they can support. The reported impact is No E-Rate minus Base, so a negative value represents an economic loss caused by removing the program.

a. Funding Categories

TABLE 1: E-RATE FUNDING CATEGORIES

Category	Annual funding	Share	Definition and BEYOND treatment
Category 1	$1.548B	59.5%	Connectivity to the school and library: data transmission and internet access, including leased fiber and other broadband services. Modeled primarily as relief to wired, wireless, and satellite telecom costs.
Category 2	$1.053B	40.5%	Connectivity inside the school and library: routers, switches, wireless access points, cabling, managed internal broadband, and maintenance. Modeled primarily through annual capital-service relief.
Total	$2.600B	100.0%	Schools, school districts, school consortia, and libraries.

Note:
The dollars are Average annual committed school funding requests with funded status, FY2021–FY2025.
Each school district, independent school, library system, or independent library receives a five-year, pre-discount Category 2 budget. The first fixed cycle was FY2021–FY2025.

Note that for Category 2, this is the amount of pre-discount eligible expenditures over the entire five-year cycle. A district does not receive one-fifth of the budget each year. It can use a large share in one year and little or nothing in another.

b. Primary Explanatory Variables

TABLE 2: EXPLANATORY VARIABLES

Variable	Measure	How it is used
E-Rate funding	Average annual Category 1 + Category 2 school and library commitments	Primary explanation of absolute losses: larger funding removals generally produce larger state and regional losses.
Education-sector size	Benchmark education-sector output	Represents the benchmark amount of education services produced. Changes in education output are interpreted as changes in the quantity or intensity of services, not enrollment or learning outcomes.
Funding intensity	E-Rate funding as a share of education output	Measures the size of the direct shock to the education sector. Multipliers also reflect interstate spillovers and the size of the local funding denominator.

Note:

All states other than Alaska: Category 1 is allocated to current telecommunications inputs, and 75% of Category 2 is represented as annual capital-service relief.[35]

Alaska: 10% of total school E-Rate funding is allocated to current telecommunications inputs; 90% is treated as capital-related, and 75% of that amount becomes annual capital relief.

Schools account for about 96.9% of the E-Rate funding modeled. School E-Rate funding relative to education-sector output is therefore the most useful sector-scale measure of exposure; public-library funding is included in a much broader government-services activity and represents only about 3.1% of modeled funding.

[35] Category 2 formally includes some managed and maintenance services in addition to equipment and internal connections. The 75% factor is not an assumption that 75% of Category 2 funding is literally spent on capital each year; rather, it approximates the annual resource cost associated with multiple vintages of network equipment that remain in service at the same time. To translate a multi-year stream of capital investment into an annual flow of capital services, we first construct the capital stock by accumulating each year's investment and allowing earlier investment vintages to depreciate over time. The resulting capital stock therefore reflects both new investment and the undepreciated portion of investments made in prior years. We then convert this stock into an annual capital-services flow by applying the user cost of capital, which reflects both depreciation and the required return on capital. This approach recognizes that capital expenditure creates assets that provide productive services over multiple years, rather than treating the full expenditure as an input consumed in the year in which it occurs. We assume a depreciation rate of 13% and a rate of return of 7%.

IV. Quantifying the Economic Impact of Removing or Reducing E-Rate Support

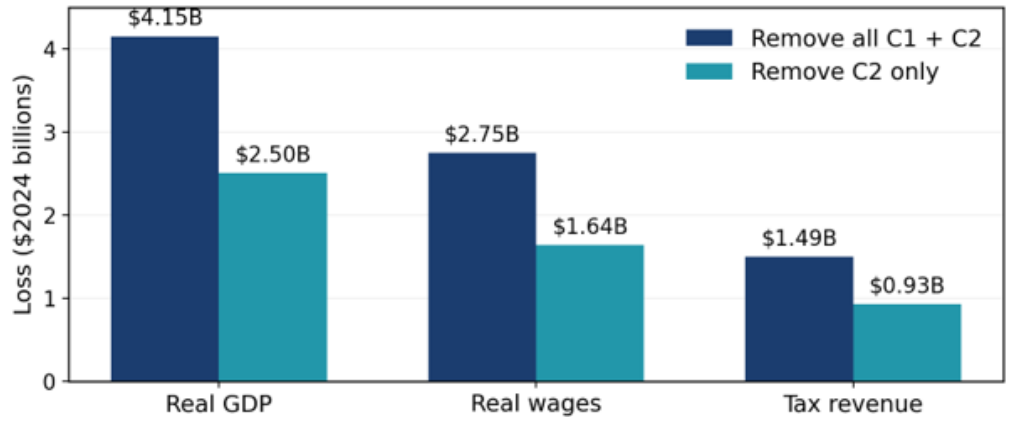
In Scenario 1, we treat current connectivity as essential to schools and libraries. Eliminating E-Rate therefore increases the amount they must pay from their own budgets for broadband and network infrastructure. Because those inputs cannot simply be replaced by other education inputs, the higher connectivity cost reduces the overall level of education and library services they can support. In Scenario 2, we apply the same logic but remove only the capital- and infrastructure-related support represented in the Category 2 scenario.

A. National Impact

a. Overall Summary

The figure below shows the overall impact on GDP, wages and tax revenues when E-Rate funding is completely eliminated and when only Category 2 funding is eliminated.

FIGURE 1: NATIONAL ANNUAL LOSS FROM ELIMINATING ALL/CATEGORY 2 ONLY E-RATE SUBSIDIES FOR SCHOOLS AND LIBRARIES



Note; National economic losses. Dollar values are in real 2024 dollars; losses are shown as absolute magnitudes.

b. Scenario 1: National Loss if All E-Rate Funding ($2.6 billion) is Eliminated

Removing school and library E-Rate support reduces real GDP by $4.2 billion, real wages by $2.8 billion, and total real tax revenue by $1.5 billion. Relative to $2.6 billion of average annual

school and library commitments, the loss multipliers are 1.60x for GDP, 1.06x for wages, and 0.57x for tax revenue. Schools continue to require broadband and internal network infrastructure, and those needs do not disappear when E-Rate is removed. Because broadband is a necessary input that cannot simply be replaced with teachers, books, buildings, or other educational resources, schools must devote more of their own budgets to connectivity. That leaves less money available to support the overall level of education services. As education activity declines, schools also purchase fewer of the other goods and services used to provide education. This reduction in demand spreads through suppliers and the broader economy, contributing to declines in GDP, wages, household spending, and tax revenue.

The national impact is broad-based: removing E-Rate support raises schools' and libraries' effective connectivity and network-infrastructure costs, reducing education activity and, in turn, demand for labor, suppliers, and other goods and services throughout the economy. Put differently, the model estimates that each dollar of E-Rate support is associated with approximately $1.60 in GDP: eliminating roughly $2.6 billion in annual support for schools and libraries reduces annual real GDP by approximately $4.2 billion.

c. Scenario 2 Summary: National Loss if Only Category 2 Funding ($1.2 billion) is Eliminated

Removing approximately $1.2 billion of capital- and infrastructure-related E-Rate support affected in the Category 2 scenario reduces real GDP by $2.5 billion, real wages by $1.6 billion, and total real tax revenue by $0.9 billion. Relative to this modeled funding amount, the loss multipliers are 2.1x for GDP, 1.4x for wages, and 0.8x for tax revenue. The effect is large because Category 2 supports the internal network infrastructure that makes an external broadband connection usable throughout a school or library.

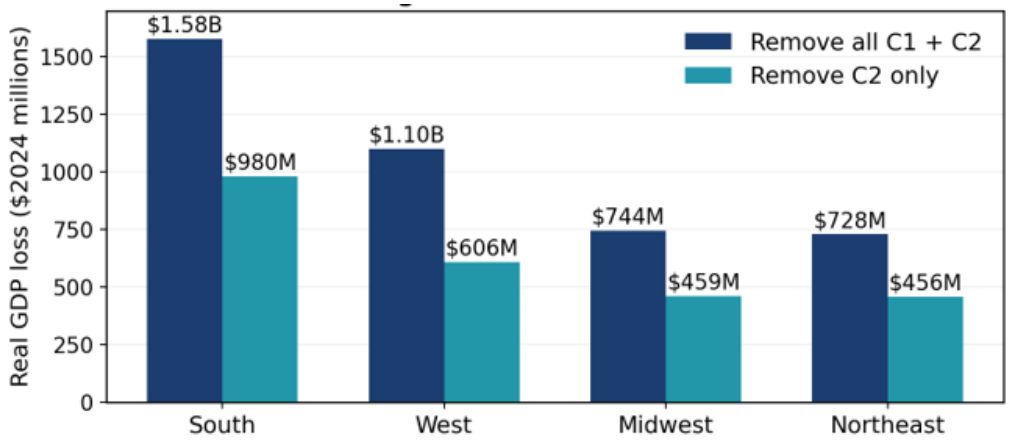
B. Regional Impacts

The average annual E-Rate funding from FY2021 through FY2025 was concentrated disproportionately in the South and West. Schools and libraries in the South received the largest average annual amount, about $999 million, followed by the West at $786 million. Average annual funding was substantially lower in the Midwest, at $454 million, and in the Northeast, at $361 million.

Regional absolute losses mainly follow the amount of E-Rate funding removed. Regional multipliers require more care. Because E-Rate is removed nationwide, a region's GDP loss includes spillovers from weaker activity in other regions, while the multiplier denominator

includes only that region's own E-Rate funding. Funding intensity helps describe the size of the direct local shock, but a relatively small local funding base can also produce a high multiplier when nationwide spillovers are large relative to that denominator.

FIGURE 2: REGIONAL ANNUAL LOSS FROM ELIMINATING ALL/CATEGORY 2 ONLY E-RATE SUBSIDIES FOR SCHOOLS AND LIBRARIES



a. Scenario 1: Regional Impact if All E-Rate Funding is Eliminated

Regional differences in absolute losses are driven largely by the amount of E-Rate support removed, while funding relative to the size of the education sector helps describe the size of the direct local shock. Regional multipliers also reflect nationwide spillovers and the size of each region's own funding denominator.

- The South receives the largest amount of E-Rate support and has a high funding-to-education-output ratio, resulting in the largest estimated dollar losses in GDP, labor income, and tax revenues.
- The West exhibits a similar level of funding intensity and consequently experiences the second-largest economic impacts, with California accounting for much of the absolute loss and Alaska's relatively capital-intensive broadband investments contributing to the regional results.
- The Midwest falls near the national average in both funding levels and funding intensity, producing correspondingly moderate economic impacts.
- By contrast, the Northeast receives the smallest amount of E-Rate funding and experiences the smallest absolute reductions in GDP and tax revenues. Its 2.02x GDP multiplier is nevertheless the highest among the four regions because the regional GDP loss includes spillovers from the nationwide removal of E-Rate, while the multiplier denominator includes only the Northeast's own comparatively small funding amount.

TABLE 3: REGIONAL STATISTICS AND GDP LOSS WHEN ALL E-RATE SUPPORT IS ELIMINATED

Region	E-Rate funding	School funding / education output	GDP loss	GDP x
South	$999M	0.150%	$1.58B	1.58x
West	$786M	0.147%	$1.10B	1.40x
Midwest	$454M	0.120%	$744.5M	1.64x
Northeast	$361M	0.078%	$728.2M	2.02x

TABLE 4: REGIONAL EFFECTS ON WAGES AND TAX REVENUE WHEN ALL E-RATE SUPPORT IS ELIMINATED

Region	Wage loss	Wage x	Tax-revenue loss	Tax x
South	$1.06B	1.06x	$550.1M	0.55x
West	$736.9M	0.94x	$410.1M	0.52x
Midwest	$491.7M	1.08x	$268.7M	0.59x
Northeast	$458.9M	1.27x	$264.6M	0.73x

Although the composition of E-Rate spending is broadly similar across regions, with Category 1 accounting for a comparable share of funding in the South, Midwest, and Northeast, the West has a somewhat larger Category 1 share because of high-cost states such as Alaska. Overall, these differences in spending composition are relatively modest. Absolute losses are closely related to the amount of E-Rate funding affected, indicating that regional economic impacts are explained primarily by differences in the scale of E-Rate funding and the relative size of regional education sectors rather than by differences in how E-Rate funds are allocated across service categories. The South and West have both large funding bases and relatively high school and library funding intensity, which helps explain their larger dollar losses. School and library funding intensity is the program amount relative to the size of the education sector and therefore measures how large the direct shock is for the receiving sector.

The Northeast has a high GDP multiplier compared to other regions. Its 2.02x regional multiplier compares the region's total GDP loss with only the E-Rate funding removed in that region. Because E-Rate is removed in every state at the same time, the GDP loss includes both the Northeast's own direct and follow-on losses and spillover losses from weaker activity elsewhere in the country. When schools and libraries in other regions face higher effective costs and economic activity weakens, lower demand, income, and interstate business activity feed back into the Northeast.

The denominator, however, includes only the Northeast's own E-Rate funding. Because that funding base is relatively small, nationwide spillover effects are large relative to the

denominator, which pushes the measured multiplier upward. In other words, a high regional multiplier does not necessarily mean that E-Rate dollars are more economically productive in the Northeast; it can also reflect the region's exposure to economic losses originating elsewhere in the country. School and library E-Rate funding intensity remains useful for describing the size of the direct local shock to education, but it should not be treated as a stand-alone predictor of the multiplier.

b. Scenario 2: Regional Impact if Category 2 E-Rate Funding is Eliminated

The table below shows that if only Category 2 funding is eliminated, the regional effects are still quite large. The pattern is similar to the removal of all E-Rate funding. However, all the multipliers are larger than the base case implying that removing a dollar of Category 2 funding has a larger impact on GCP, wages and tax revenues than removing an average funding dollar of E-Rate.

TABLE 5: REGIONAL FUNDING AND ECONOMIC LOSS WHEN CATEGORY 2 E-RATE SUPPORT IS ELIMINATED

Region	C2 funding affected	C2-only GDP loss	GDP x
South	$447.7M	$980.0M	2.19x
West	$385.2M	$606.5M	1.57x
Midwest	$204.9M	$458.6M	2.24x
Northeast	$157.0M	$456.5M	2.91x

C. State-Level Impact

For the state-level impact we only model scenario 1, where all E-Rate subsidies are eliminated. The amount of E-Rate funding removed is the strongest predictor of absolute state losses. States with large funding programs remove more purchasing power and cost relief from the education sector, producing larger changes in GDP, wages, and tax.

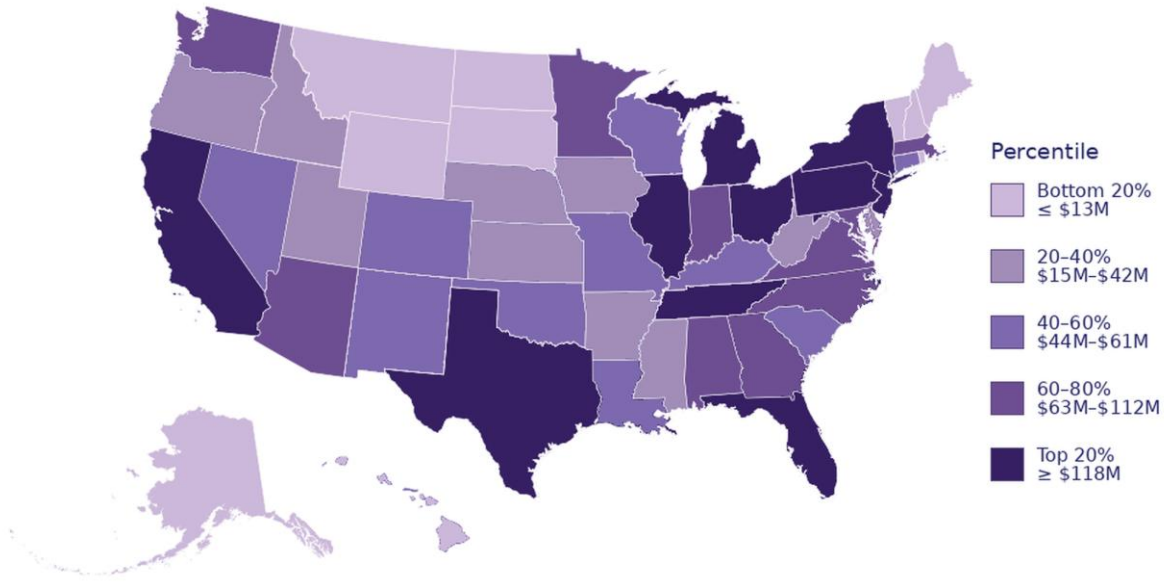
a. Scenario 1: State-Level Impact on GDP, Wages and Tax

California and Texas have the largest GDP losses because they combine large E-Rate funding amounts with very large economies and education sectors. Their loss multipliers are sizable, but not the highest, because the funding removed is small relative to the scale of their education sectors. By contrast, states such as Tennessee, Alabama, and New Mexico receive less E-Rate funding in absolute terms but have higher funding relative to education output, making the direct shock to their education sectors proportionally larger. Funding intensity therefore helps

explain the size of the initial state-level shock, although it does not by itself determine the loss multiplier because states also experience spillovers from E-Rate removal elsewhere in the country. California has the largest modeled GDP loss ($630 million), followed by Texas ($350 million), New York ($300 million), and Florida ($230 million). These four states also have four of the largest E-Rate funding amounts in the model. Tennessee stands out because its school funding is relatively large compared with the size of its education sector (about 0.259%), making the direct education-sector shock comparatively large for a smaller state economy.

The map below provides a nationwide view of these state-level GDP losses. Darker shading indicates larger annual real GDP losses from eliminating E-Rate support.

FIGURE 3: DISTRIBUTION OF ANNUAL STATE-LEVEL REAL GDP LOSSES FROM REMOVING E-RATE SUPPORT



Sources and Notes: BEYOND Model Results. GDP losses are measured relative to the baseline.

The map also shows that the economic effects are geographically broad. States with larger E-Rate funding amounts generally experience larger absolute GDP losses, while losses also spread across state economies through suppliers, household income, spending, and interstate trade.

FIGURE 4: TEN LARGEST STATE GDP LOSS FROM ELIMINATING ALL E-RATE SUBSIDIES FOR SCHOOLS AND LIBRARIES

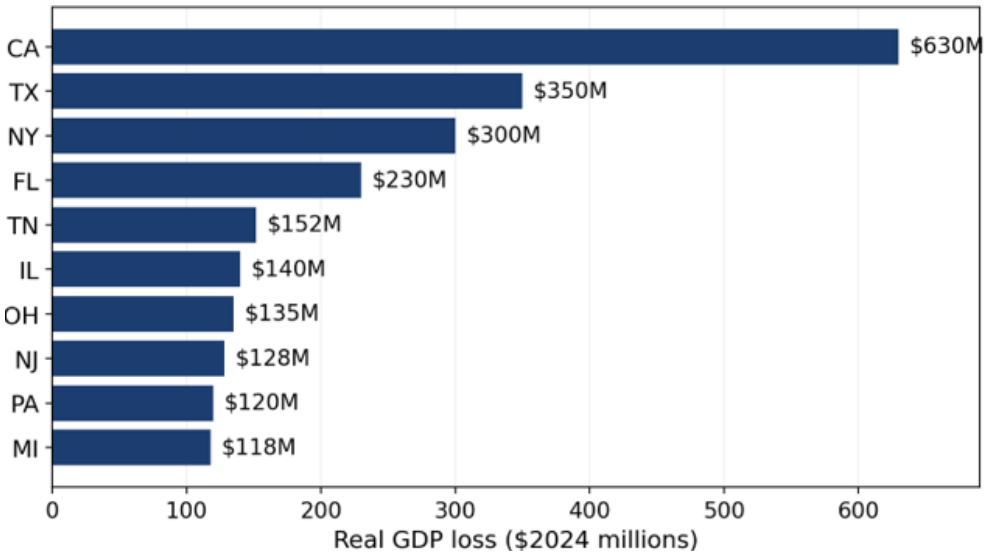


TABLE 6: SUMMARY STATISTICS ON THE TEN LARGEST STATE GDP LOSS FROM ELIMINATING ALL E-RATE SUBSIDIES FOR SCHOOLS AND LIBRARIES

State	Region	E-Rate funding	School funding / education output	GDP loss	GDP x
CA	West	$346.9M	0.117%	$630.0M	1.82x
TX	South	$243.2M	0.159%	$350.0M	1.44x
NY	Northeast	$161.5M	0.081%	$300.0M	1.86x
FL	South	$126.0M	0.128%	$230.0M	1.83x
TN	South	$88.5M	0.259%	$152.0M	1.72x
IL	Midwest	$94.4M	0.117%	$140.0M	1.48x
OH	Midwest	$75.8M	0.126%	$135.0M	1.78x
NJ	Northeast	$56.2M	0.096%	$128.0M	2.28x
PA	Northeast	$66.0M	0.083%	$120.0M	1.82x
MI	Midwest	$73.8M	0.159%	$118.0M	1.60x

b. State-Level Loss Multipliers

A loss multiplier compares a state's total economic loss with that state's own E-Rate funding. The multiplier tends to be higher when funding is large relative to education-sector output. Although funding intensity is useful for understanding the size of the direct local shock, it is not a stand-alone predictor of the multiplier. Because E-Rate is removed in every state simultaneously, each state also experiences spillovers from weaker activity elsewhere in the country. A state with a relatively small local funding denominator can therefore have a high multiplier even when its absolute GDP loss is modest. For that reason, the multiplier should not be interpreted as a ranking of how effective E-Rate is across states.

Why do several Northeast states rank highly? The same intuition that explains the Northeast regional multiplier also applies at the state level. E-Rate is removed in every state simultaneously, so each state's GDP loss includes interstate and national spillovers from weaker activity elsewhere, while the multiplier denominator includes only that state's own E-Rate funding. This is especially important for smaller-funding Northeast states such as New Hampshire, Rhode Island, and Maine: nationwide spillover losses are large relative to their local funding denominators. A high state multiplier therefore does not necessarily mean E-Rate dollars are inherently more economically productive in that state.

FIGURE 5: TEN LARGEST STATE GDP LOSS MULTIPLIER ELIMINATING ALL E-RATE SUBSIDIES FOR SCHOOLS AND LIBRARIES

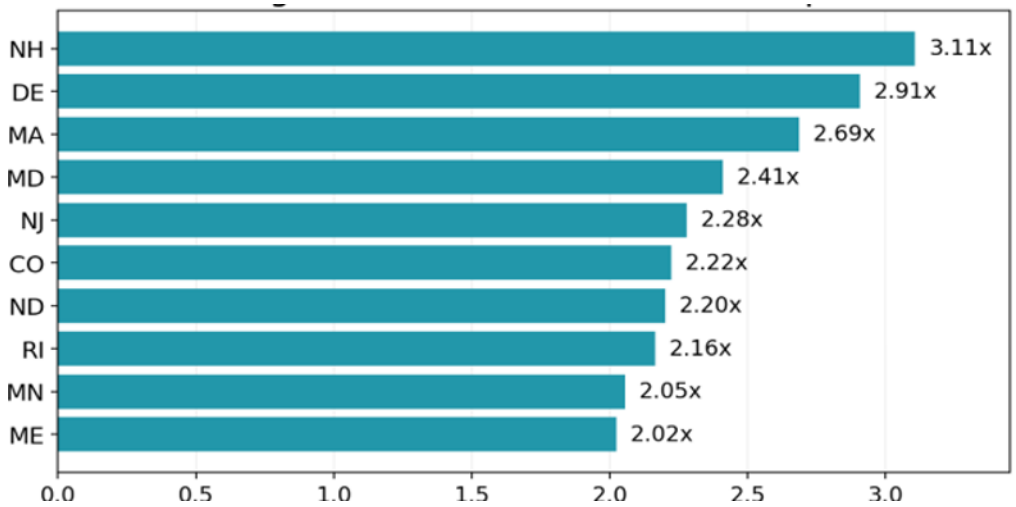


TABLE 7: SUMMARY STATISTICS ON THE TEN LARGEST STATE GDP LOSS MULTIPLIER FROM ELIMINATING ALL E-RATE SUBSIDIES FOR SCHOOLS AND LIBRARIES

State	Region	E-Rate funding	School funding / education output	GDP loss	GDP x
NH	Northeast	$4.2M	0.046%	$13.0M	3.11x
DE	South	$5.2M	0.089%	$15.0M	2.91x
MA	Northeast	$35.0M	0.054%	$94.0M	2.69x
MD	South	$34.5M	0.084%	$83.0M	2.41x
NJ	Northeast	$56.2M	0.096%	$128.0M	2.28x
CO	West	$27.0M	0.072%	$60.0M	2.22x
ND	Midwest	$3.5M	0.079%	$7.8M	2.20x
RI	Northeast	$5.1M	0.065%	$11.0M	2.16x
MN	Midwest	$30.7M	0.090%	$63.0M	2.05x
ME	Northeast	$6.0M	0.081%	$12.1M	2.02x

D. Sensitivity Analysis

The FCC reports that the FY2024 E-Rate improper-payment error rate fell from 1.59% to 1.27%. Because 1.27% is below the statutory 1.5% threshold used to identify programs susceptible to significant improper-payment risk, the FCC states that E-Rate is no longer considered susceptible to a significant risk of improper payments. [36] However, to investigate a hypothetical scenario where there is a higher "waste" in the system we run a sensitivity analysis where we assume that 2.5% of the E-Rate funds is "wasted" due to fraud. The unproductive share can be interpreted broadly to include funds lost through fraud or improper payments, expenditures on unnecessary or overpriced services and equipment, inefficient procurement, investments that are poorly utilized, or other circumstances in which an E-Rate dollar does not produce the connectivity or internal-network benefits represented in the model.

This scenario therefore deliberately adopts a more demanding test of the program's economic value than simply assuming that every E-Rate dollar is fully productive or below the 1.5% threshold. For Category 1 support, an ineffective dollar is assumed not to generate the modeled benefit associated with providing or maintaining broadband connectivity. For Category 2, it does not generate the modeled benefit associated with internal network infrastructure and capital services. At a 2.5% inefficiency assumption, for example, the analysis effectively treats only 97.5 cents of every dollar of E-Rate support as generating its intended economic benefit, while the remaining 2.5 cents produces no corresponding productive return.

TABLE 8: NATIONAL GDP LOSS FROM HYPOTHETICAL UNPRODUCTIVE E-RATE SPENDING COMPARED TO E-RATE ELIMINATION

Assumed ineffective share	Support ineffective	GDP loss	Wage loss	Tax-revenue loss	GDP loss vs. full removal
2.50%	$65.0M	$113.9M	$67.7M	$32.1M	2.70%

From the table and chart, we see that the economic cost of ineffective E-Rate spending rises roughly in proportion to the assumed share of support that fails to generate its intended benefit but remains far smaller than the cost of eliminating the program altogether. If 2.5% of support is ineffective, about $65 million of E-Rate funding is assumed to generate no productive benefit, producing an estimated $113.9 million decline in GDP, $67.7 million in lost wages, and

[36] FCC, "Inspector General's Top Management and Performance Challenges for FY 2025 for the Federal Communications Commission," October 29, 2024, https://www.fcc.gov/sites/default/files/fy25_fcc_tmpc_mngt-response_10292024.pdf.

$32.1 million in lost tax revenue.[37] Note that a 2.5% ineffective share produces a GDP loss equal to only 2.7% of the loss associated with full E-Rate removal. Our analysis therefore suggests that concerns about inefficiency do not, by themselves, provide an economic rationale for wholesale program elimination: the benefits generated by the productive majority of E-Rate spending remain much larger than the losses associated with plausible levels of ineffective spending. These results do not imply that waste or fraud is unimportant from a program-management perspective. Within this economy-wide modeling framework, moderate ineffective use is a second-order issue for the aggregate result. Program-integrity and oversight concerns can therefore be addressed without treating moderate ineffective use as economically equivalent to eliminating E-Rate.

V. Conclusion

Schools and libraries make connectivity investments within constrained budgets and additionally do not capture all the benefits those investments generate. Reliable broadband supports education, digital skills, access to information, and ultimately human-capital formation, with benefits that accrue to students, employers, taxpayers, and the broader economy. Network effects further increase the social value of widespread connectivity. E-Rate addresses this divergence between constrained sub-optimal private returns and social returns by lowering the effective cost of connectivity and encouraging investment closer to the socially efficient level. The relevant question for policymakers is therefore not simply how much the Universal Service Fund spends on E-Rate, but what economic activity and social value those expenditures support.

The FCC is considering eliminating or significantly reducing E-Rate support for broadband connectivity and related services provided to schools and libraries. Eliminating the program would increase the effective cost of broadband services for public and private K-12 schools and libraries that increasingly rely on digital connectivity to support teaching, learning, school operations and security, cybersecurity, internal and external communications, and access to online educational and informational resources.

[37] This is a counterfactual scenario used as an illustration. As noted above, FCC's OMB has found that less than 1.5% of the funds is wasted because of fraudulent activities.

Our analysis finds that terminating E-Rate is economically consequential. Using Brattle's economic impact model, we estimate that eliminating approximately $2.6 billion in annual E-Rate support for schools and libraries would reduce annual real GDP by approximately $4.2 billion, real wages by $2.8 billion, and tax revenues by approximately $1.5 billion. Put differently, each dollar of E-Rate support is associated with approximately $1.60 in economic output. The reason the economy-wide loss exceeds the amount of support removed is that broadband remains a necessary input. Without E-Rate, schools and libraries devote more of their own budgets to connectivity, leaving less available to support other education and library activities. As that activity declines, institutions buy less from suppliers and use less labor, and those reductions spread through household income, consumption, and tax revenues.

Our analysis also explores the consequences of eliminating only the capital- and infrastructure-related support represented in the Category 2 scenario, which the FCC has raised questions about in the NPRM. Our results show why Category 2 support should not be viewed as ancillary to the program's core connectivity mission. Category 2 finances the internal infrastructure that allows an external broadband connection to be used throughout a school or library. Removing Category 2 support alone produces an estimated $2.5 billion annual GDP loss, $1.6 billion reduction in real wages, and $0.9 billion reduction in tax revenues. These losses are substantial relative to the roughly $1.2 billion of Category 2 support removed. Connectivity to a building has limited value if the institution lacks the internal network necessary to deliver that connectivity where students, teachers, staff, patrons and the buildings' countless systems actually use it.

The effects are also geographically broad. States receiving the largest amounts of E-Rate support generally experience the largest absolute economic losses, while the magnitude of the shock relative to the local education sector helps explain differences across states and regions. California alone experiences an estimated GDP loss of approximately $630 million, followed by Texas at approximately $350 million, New York at approximately $300 million, and Florida at approximately $230 million.

Additionally, the sensitivity analysis provides important context for concerns about waste, fraud, inefficient procurement, or other unproductive expenditures. Program integrity remains a legitimate policy objective, but the appropriate economic comparison is between the cost of ineffective spending and the benefits that would also be lost by reducing the program. Even conservatively assuming that 2.5% of E-Rate support generates no intended economic benefit, the estimated GDP loss associated with that inefficiency is insignificant compared to the GDP loss associated with eliminating E-Rate altogether. Thus, the existence of some ineffective

spending does not imply that eliminating or substantially reducing the program increases economic welfare. Indeed, eliminating an economically productive program to prevent a relatively small amount of ineffective spending can impose costs far greater than the problem it seeks to solve.

These results in aggregate underscore that changes to E-Rate have consequences for national, state and regional economies through the education sector and its extensive linkages to other industries. The analysis demonstrates that any claimed fiscal savings from eliminating E-Rate substantially understate the true economic costs. Any reduction in E-Rate spending should also be characterized correctly from a fiscal perspective. Because E-Rate is financed through the USF rather than through general federal revenues, eliminating or reducing E-Rate does not create conventional budgetary saving for taxpayers; instead, it reduces the amount that must be collected through the USF contribution mechanism. If the concern is that the existing USF contribution mechanism is increasingly costly, narrow, or unsustainable, that is fundamentally a question of USF contribution reform, who contributes, what revenue base is assessed, and how the burden is distributed, not evidence that economically valuable E-Rate expenditures should be reduced. Conflating these two issues risks solving a financing problem by cutting an underlying program which generates significant benefits.

Schools and libraries operate under constrained budgets and must allocate limited resources across teachers, instructional materials, facilities, security, technology, and other essential services. This broader budget constraint is not something the FCC can directly solve. The FCC can, however, address the portion of that constraint associated with communications and connectivity. E-Rate effectively relaxes schools' budget constraints with respect to broadband and internal network infrastructure, allowing them to obtain the connectivity required for modern education without diverting as many resources from other educational inputs. Viewed from a partial-equilibrium perspective, E-Rate addresses the connectivity component of the broader market failure problem in education. Eliminating E-Rate without an offsetting source of education funding would reverse that relief, tightening schools' overall budget constraints and forcing greater tradeoffs between connectivity and other educational services, leading to significant economic loss.