

THE ECONOMIC IMPACT OF TELECOMMUNICATION IN PRIVATE SECTOR: CASE STUDY ROSHAN TELECOMMUNICATION

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Abstract

This study investigates the impact of telecommunications technology and innovation on economic growth in developed and developing countries. It investigates the non-linear or kink effect in the relationship between these variables and economic growth. The study analyzes the impact on individual countries and groups based on economic development and telecommunications technology. The findings show a kink effect, with some related variables having different magnitudes depending on their levels and kink points. The study also finds that telecommunications technology and innovation have a more significant impact on developing countries than developed countries. (2020 Paravee Maneejuk, Woraphon Yamaka*). This paper investigates the key determinants of telecommunications industry reforms in developing countries, focusing on liberalization, privatization, and regulation restructuring. It estimates the extent to which these policies have translated into actual infrastructure deployment. The study finds a positive relationship between digital cellular segment competition and fixedline segment growth. Countries facing increasing institutional risk and financial constraints are more likely to introduce competition in the digital cellular segment and privatize fixed-line incumbents, which enhance fixed-line infrastructure deployment. Conversely, competition in the analogue cellular segment and the creation of a separate regulator are less attractive policies, with negative or non-significant impacts on fixed network deployment. (2010 Farid Gasmi a,*, Laura Recuero Virto b) This study examines the impact of telecommunications liberalization in Africa on sectoral performance and economic growth. It considers WTO commitments and regulatory quality, as well as competition in the mobile segment. Adherence to the GATS Reference Paper leads to lower prices globally. (2008 Calvin Djiofack-Zebaze & Alexander Keck*) The paper examines the relationship between telecommunications infrastructure competition, investment, and productivity using econometric modeling and input-output economics. Results show that most industries benefit from incorporating telecommunications technology advances, encouraging infrastructure investment in production processes. (2006 Lisa Correa) Telecommunication services' potential benefits to rural and remote communities are difficult to determine; this article reviews rationales, evidence, and concrete ways forward. (2005 Ricardo Rami'reza, Don Richardsonb). The purpose of this review paper is to understand the Economic Impact of Telecommunication globally & how its effect the country's economic, now adays it seems that Telecommunication is in fast growing & facilitate the Human for easy access to the world changes, connecting peoples all over the world through different channels & pave the ways for easiness & fustiest connections of peoples around the world in different officials & personals activities. All Technologies innovations depend on Telecommunication to get start & usable in the markets. As reviewed 26_Journals its seems that Telecommunication has direct impact on the economics of the countries & empowered the country's economic as well connect the peoples around the world, as we reconsider the past centuries with new centuries unbelievable innovations & changes come up & coming which all mostly dependable on Telecommunications services, all the world connect with each other's through Internet in business & personal prospectives, even though Buying, Selling, Working, Education & etc through internet & telecommunication services, which played very important rules in the world especially its seems during the Covid-19 all Business ruined outstanding through internet without any big loss & business closures. Telecommunication makes the human life easy & running outstanding rules in the Economic of the countries. Author.

Keywords: The Economic Impact of Telecommunication

INTRODUCTION

Telecommunications technology and innovation significantly drive globalization and economic growth, making communication and commerce more transnational. However, the level of telecommunications technology and innovation varies across countries, leading to social, educational, and economic inequality. This is known as the "Digital divide," which refers to the gap between demographic groups and regions in access to modern information and communications technology. Studies have shown that telecommunications technology and innovation drive economic growth through value-added goods and services, labor productivity, and efficiency. This study aims to reinvestigate the impacts of telecommunications technology and innovation on economic growth, focusing on the asymmetric impact in developing and developed countries. The study employs Time-series kink regression (TKR) model for individual country level and Panel kink regression (PKR) model for cross-country level. The findings provide scientific recommendations for better development of telecommunications technology and innovation, helping to avoid adverse effects on the economy.

This paper examines the distributional effect of Mexico's 2013/14 telecommunications reforms on households, focusing on mobile communications. The quantitative impact of these reforms is greater than fixed telecommunications, particularly in regions with poor market penetration rates and low infrastructure development. The paper focuses on the income and expenditure data by decile collected by INEGI in its National Survey of Household Income and Expenditure (ENIGH). The paper argues that the distributional effects of regulation benefit primarily the population living in poverty conditions. The reforms, which included asymmetric measures, aimed to establish conditions for effective competition in the provision of telecommunications and broadcasting services, guaranteeing access to information and communication technologies, as well as broadcasting and telecommunications services, including broadband and Internet. The Federal Institute of Telecommunications (IFT) was granted powers to declare operators with market shares above 50% in either of the two sectors it supervised. Further data analysis and data collection are needed to provide a more comprehensive answer.

The telecommunications sector has experienced significant reforms, transforming infrastructure industries worldwide. Both developed and developing countries aim to improve supplier performance and introduce competition in some segments. However, policymakers in developing countries face challenges such as poor infrastructure, weak economic conditions, and inefficient institutions. Political accountability is an important determinant of regulatory performance, and policies aimed at enhancing politically accountable systems should be given due attention in development programs. This paper investigates the relationship between sectoral reforms in developing countries and the evolution of the sector. It evaluates the impact of these reforms on infrastructure deployment and identifies the main factors that led to specific reforms. Factors such as corruption, lack of democracy, and high debt service and inefficient taxation also impact market outcomes. The paper contributes to understanding the determinants of telecommunications reforms in developing countries by examining the role of infrastructure deployment, institutional risk, and access to public funds in the decisions to introduce competition, privatize state-owned incumbent operators, and create a separate regulatory

authority.

The telecommunications industry has experienced rapid growth and structural change, with mobile subscriptions growing from 200 million to nearly 2.7 billion between 1996 and 2006. Mobile penetration rates in 30 OECD countries currently top 85%, but coverage is still less than universal. The population share of mobile subscribers in developing countries reached 34% in 2006, and 8% in LDCs. Mobile telephony has led to increased accessibility in rural and disadvantaged areas, outnumbering fixed-lines by nearly nine to one. The sector's dramatic growth coincided with widespread liberalization, with national monopolies facing competition and privatization in many countries. Technological advances in switching, transmission, and software have enabled new operators to bypass the facilities of big networks with statutory monopolies. The multiplication of information-sending, receiving, and management networks has made it increasingly difficult for public telecommunications monopolies to satisfy user demands.

Economists have observed trends in infrastructure investment and productivity, with highly developed national economies correlated with highly developed telecommunications infrastructure. However, no UK study has examined the impact of telecommunications and its diffusion on productivity performance at economy-wide and sectoral levels. This study uses an innovative analytical approach to suggest that most industries have benefited from incorporating advances in telecommunications technology, possibly due to encouraging infrastructure investment in production processes.

Telecommunication services offer potential benefits to rural and remote communities, but their actual impact is difficult to determine. This paper examines the impact of advanced telecommunication services in remote communities in Canada, specifically in remote First Nations communities. K-Net, an aboriginal network, provides broadband connectivity to these communities, part of Nishnawbe-Aski Nation (NAN), with 300-900 inhabitants. The network aims to improve the livelihoods of these communities by providing information and communication on technologies and services.

Table 615 : Sample literature review matrix for some of the selected, exclusively relevant papers The Economic Impact of Private Telecommunication in Afghanistan, the Case of Roshan from 2020 Till 2000 (List in chronological order)

Author/s (Year)	Topic/ Title of the paper	Type of Research	Source of Data/ Intervention area	Research Tools	Research Methodology
Paravee Maneejuk, Woraphon Yamaka (2020)	An analysis of the impacts of telecommunications technology and innovation on economic growth	qualitative Approach	Center of Excellence in Econometrics, Faculty of Economics, Chiang Mai University, Chiang Mai, 50200, Thailand	Interview Strategic Plan Tables Graph & charts	Interview Data Collection Webs

Martin E. Cave c,d, Elisa V. Mariscal a,b,* (2019)	The impact of telecommunications regulation on less well-off Mexican households	Qualitative Approval	a Centro de Investigación y Docencia Económicas (CIDE), Carretera México-Toluca 3655, Santa Fe, Altavista, 01210, Mexico b Global Economics Group (GEG) – Mexico, La Presa 169-PB, Colonia San Jerónimo Lidice, La Magdalena Contreras, 10200, Mexico City, Mexico c London School of Economics, Houghton Street, London, WC2A 2AE, United Kingdom d UK Gas & Electricity Markets Authority (GEMA), 10 South Colonnade, Canary Wharf, London, E14 4PU, United Kingdom	Interview Tables Graph & charts	Interview Data Collection Webs Case study
Raúl Katz* Juan Jung** (2019)	The economic impact of Telecommunications in the Republic of Cameroon	quantitative Approach	* Columbia Institute for Tele-Information - Columbia University (United States) and Telecom Advisory Services **Universidad Complutense de Madrid (Spain) and Telecom Advisory Services	Interview Strategic Plan Tables Graph & charts	Interview Data Collection Webs
Kwami Ossadzifo Wonyra (2018)	Impact of Telecommunications Market Liberalization on Labor Productivity in Economic Community of West African States	quantitative Approach /	1Department of Economics, University of Kara (Togo), Kara, Togo	Interview Long Terms Plan Tables Graph & charts	Interview Data Collection Webs
Georges Harb (2017)	The economic impact of the Internet penetration rate and telecom investments in Arab and Middle Eastern countries	Quantitative Approach	Notre Dame University (Louaize), Department of Economics, Zouk Mosbeh, P.O.Box: 72, Zouk Mikael, Lebanon	Interview Tables Graph & charts	Interview Data Collection Webs Case study
Taylor & Francis	The Impacts of Telecommunications	Qualitative Approach	a. Information Systems, University of the	Interview Plans	Interview Data

(2015)	Infrastructure and Institutional Quality on Trade Efficiency in Africa		WesternCape, Cape b. Town, South Africa Information Systems, University of Cape Town, Rondebosch, Cape Town, 7701 South Africa c. Department of Information Systems, Virginia Commonwealth University, Richmond, VA, USA	Tables Graph & charts	Collection Webs
Francis Atsu, Charles Agyei, William Phanuel Darbi and Sussana Adjei- Mensah (2014)	The impact of telecommunication revenue on economic growth: evidence from Ghana	quantitative Approach	Ghana Institute of Management and Public Administration, Achimota –Accra, Ghana	Interview Plans Tables Graph & charts	Interview Data Collection Webs Questionaries
Peter Nijkamp a & Ilan Salomon b c Taylor & Francis (2014)	Future spatial impacts of telecommunications	Qualitive Approach	a. Department of Economics, Free University, Amsterdam b. Department of Geography, Hebrew University, Jerusalem c. Visiting professor of transportation, the Transportation Center , Northwestern University	Interview Tables Graph & charts	Interview Data Collection Webs
Hopestone Kayiska Chavula (2013)	Telecommunications development and economic growth in Africa	quantitative Approach	Economic Commission for Africa (ECA), ICT, Science & Technology, PO Box 3001, Addis Ababa, Addis Ababa, Ethiopia	Interview Plans Tables Graph & charts	Interview Data Collection Webs Questionaries

<p>Sang H. Lee a, John Levendis b & Luis Gutierrez cTaylor & Francis (2013)</p>	<p>Telecommunications and economic growth: an empirical analysis of sub-Saharan Africa</p>	<p>Quantitative Approach</p>	<p>a. Department of Business Administration and Finance, Southeastern Louisiana University, Hammond, LA 70402, USA b. Department of Economics, Loyola University New Orleans, New Orleans, LA 70118, USA c. Department of Economics, Universidad del Rosario, Bogota, Colombia</p>	<p>Interview Plans Tables Graph & charts</p>	<p>Interview Data Collection Webs Case Study</p>
<p>Raul KATZ & Pantelis KOUTROU MPIS (2012)</p>	<p>The Economic Impact of Telecommunications in Senegal</p>	<p>Quantitative Approach</p>	<p>Columbia Institute for Tele-Information; Columbia Business School & Imperial College Business School; Columbia Institute for Tele-Information</p>	<p>Interview Plans Tables Graph & charts</p>	<p>Interview Questionaries 'Data Collection Webs</p>
<p>Dominique Baron Chief Executive, Horus Telecom & Utilities S.A. and team of local consultants (2010)</p>	<p>The Impact of Telecommunications Services on Doing Business In Ethiopia</p>	<p>Quantitative Approach</p>	<p>Addis Ababa Chamber of Commerce and Sectoral Associations with financial support from the Swedish Agency for International Development Cooperation, Sida</p>	<p>Interview Plans Tables Graph & charts</p>	<p>Interview Data Collection Webs Case Study</p>
<p>Farid Gasmi a, □, Laura Recuero Virto b (2010)</p>	<p>The determinants and impact of telecommunications reforms in developing countries</p>	<p>Explanatory Approach</p>	<p>a. Toulouse School of Economics (ARQADE & IDEI), Université Toulouse 1 Capitole, France b. Organisation for Economic Co-operation and Development, France</p>	<p>Interview Plans Tables Graph & charts</p>	<p>Interview Data Collection Webs Case study</p>
<p>Raul L. Katz* (2009)</p>	<p>The Economic and Social Impact of Telecommunications Output</p>	<p>qualitative Approach</p>	<p>Economists, management researchers and sociologists have all examined the impact of the spread of information and communication technologies. There has until now, however, been relatively little interconnectivity and</p>	<p>Interview Plans Tables Graph & charts</p>	<p>Interview Data Collection Webs Questionnaire s</p>

			cross-fertilisation of their findings. The following paper attempts to derive a set of integrated “causality frameworks” and tests the resulting hypotheses using data for Spain.		
Calvin Djiofack-Zebaze & Alexander Keck* (2008)	Telecommunications Services in Africa: The Impact of WTO Commitments and Unilateral Reform on Sector Performance and Economic Growth	Qualitative Approach	University of Auvergne at Clermont-Ferrand, France & World Trade Organization (WTO), Geneva, Switzerland	Interview Long Teems Plan Tables Graph & charts	Interview Data Collection Web for Authors
SRIDHAR, Kala Seetharam * SRIDHAR, Varadharajan (2007)	Telecommunications Infrastructure And Economic Growth: Evidence From Developing Countries	Qualitative Approach	Röller & Waverman, 2001 & World Economic Forum, 2003	Interview Tables Graph & charts	Interview Data Collection Webs Questionaries
Lisa Correa * (2006)	The economic impact of telecommunications diffusion on UK productivity growth	Explanatory Approach	Department of Economics, Queen Mary, University of London , Mile End Road, London E1 4NS, United Kingdom	Interview Plans Tables Graph & charts	Interview Data Collection Webs Questionaries
Professor David Souter (Research Coordinator and Report Editor) with Dr Nigel Scott Professor Christopher Garforth Professor Rekha Jain Professor Ophelia Mascarenhas Dr Kevin McKemey (2005)	The Economic Impact of Telecommunications on Rural Livelihoods and Poverty Reduction: A study of rural communities in India (Gujarat), Mozambique and Tanzania	Explanatory Approach	Project research partnership: Commission for Science and Technology, Tanzania Gamos Ltd ict Development Associated Ltd Indian Institute of Management (Ahmedabad) Mozambique Information and Communication Technology Institute (at Eduardo Mondlane University)	Interview Plans Tables Question aries Graph & charts	Interview Data Collection Webs Case Study
Ricardo Ramí rez, .	Measuring the impact of	Quantitative Approach	a School of Environmental Design and Rural	Interview Plans	Interview Data

Don Richardsonb (2005)	telecommunication services on rural And remote communities		Development, Landscape Architecture Building #104 University of Guelph, Ont., Canada N1G 2C9 b Senior Consultant, Communications & Consultation, Gartner Lee Limited, 300 Town Centre Blvd., Suite 300, Markham, Ont., Canada L3R 5Z6	Tables Graph & charts	Collection Questionaries Webs library
Chunrong AI (2002)	The Impact of State Incentive Regulation on the U.S Telecommunications Industry	Explanatory Approach	Department of Economics Warrington College of Business, University of Florida, Gainesville, USA	Interview Tables Graph & charts	Interview Data Collection Questionaries Webs
Lars-Hendrik Rölller And Leonard Waverman* (2001)	Telecommunications Infrastructure and Economic Development	Simultaneous Approach	OECD countries	Interview Plans Tables Graph & charts	Interview Data Collection Case Study Webs
Maximo Torero (2000)	The Access and Welfare Impacts of Telecommunications Technology in Peru	Explanatory Approach	ZEF – Discussion Papers on Development Policy Bonn, June 2000 ZEF – Discussion Papers on Development Policy Bonn, June 2000	Interview Plans Tables Graph & charts	Interview Data Collection Library Questionaries
Gary Madden and Scott J. Savage (2000)	Telecommunications and economic growth	Quantitative Approach	Communications Economics Research Program, School of Economics and Finance, Curtin University of Technology, Perth, Australia	Interview Tables Graph & charts	Interview Data Collection Library Webs Questionnaire

Findings

The conventional economic growth theory emphasizes the positive impact of technology and innovation on economic growth. Solow's Solow growth model focuses on expanding input or product varieties, while Schumpeterian growth model suggests creative destruction. Both theories are influential for empirical studies on the impact of technology on economic growth. Telecommunication technology plays a vital role in a country's development, enhancing labor productivity and facilitating economic activities. Studies have investigated the impact of telecommunication technology on economic growth using various data sources, methodologies, and time periods. Broadband and internet users are often used as indicators in these studies. Some studies have investigated the impact of broadband on economic growth from a country group perspective, such as the OECD countries and developing countries. Many

studies also consider a wide range of telecommunications technology and innovation indicators, such as mobile phones and fixed-telephone networks.

Extending telecommunications call and access services creates benefits for various groups in the population. Enhanced externalities can arise from additional subscribers or calls, providing additional contact opportunities. In the Mexican 'calling party pays' system, the caller bears the entire cost of the call, while the callee receives 'free' benefits. The value of these externalities varies as the level of penetration and call usage changes. Access externalities may reach a peak at an intermediate level of penetration when the number of connections is high while demand is not yet fully satisfied. The spread of mobile communication services is growing significantly in all deciles, particularly in the lower half of the expenditure distribution. Access externalities have been a topic of regulatory debates in European countries, where a surcharge was added to mobile call termination charges to reduce access charges paid by customers. However, this condition is unlikely to operate in Mexico, where the mobile market is highly profitable for its dominant provider, América Móvil.

The study investigates the determinants of telecommunications reforms and their impact on network expansion through regressions. It tests two-way causal relationships between reform policies and fixed-line network deployment. The independent variables are chosen to test hypotheses on corruption, public fund cost, government commitment, return on investment, and the discount factor. The regressions also aim to explain infrastructure deployment.

This section presents regression results for price and penetration, as well as economic growth. It is evident that Africa is unique compared to the rest of the world and that liberalization appears to have made a difference. An econometric analysis is needed to control for other influential factors and developments. Table 3 summarizes the differences in average prices per 3 min call between monopolies and competitive markets during 1997-99 and 2000-03. Prices decreased in all three telecommunications segments, but in Africa, prices only declined in the international fixed-line segment and increased in the other two segments, and significantly so in the local fixed-line segment. The contrast between Africa and the developed world is particularly stark, with prices coming down significantly in the latter in all three segments. Africa has experienced price increases in all three segments, particularly in the mobile and international fixed segments, where other developing countries have seen significant price declines. However, the results do not entirely match expectations. In none of the market segments in the African sample, the price negatively correlated to any of the liberalization indicators. In the mobile segment, a positive correlation exists, and at the global level, there is a significant negative correlation only between the price and the quality of the regulatory authority in the mobile and local fixed segments and the number of operators in the international segment. The observed price trends likely reflect other policy and market developments associated with liberalization, such as allowing incumbent operators to rebalance tariffs. In Africa, such measures were not implemented before 2000, even in countries where liberalization had begun earlier.

Improvements in performance associated with technological progress can result from both internal and external industry progress, as seen in intermediate goods purchased by sectors. To

investigate which industries have benefited most from telecommunications, the study uses inter-industry data series or input-output matrices. The method involves measuring the relative impact of telecommunications infrastructure investment on productivity, using a counterfactual of what would have happened without investment. The economic impact is estimated using a measure of actual productivity and a hypothetical productivity measure where technology is constrained to a period 0 level. The Peterson Index of Direct and Indirect Productivity Gains is chosen as the measure of productivity within the framework of inter-industry economics.

The authors have developed an approach for measuring the impact of telecommunications services, focusing on community involvement in indicator selection, organizational dimensions, individual skills and capacities, and limited predictability of emerging telecommunication services. The approach includes tracking indicators at three levels, sectoral action plans, and audio-visual testimonials. Monitoring and evaluation efforts are best addressed during planning, with relevant stakeholders engaged in brainstorming their desired outcomes. The methodology addresses three hierarchies within a community context: community-wide, sectoral, and personal.

CONCLUSION

This study examines the impact of telecommunications technology and innovation on economic growth in developing and developed countries. It examines the non-linear relationship between these variables, using time-series data and panel data. The results show that fixed-telephone subscriptions, mobile cellular subscriptions, and R&D expenditure have the most significant non-linear impact on economic growth in both developed and developing countries. The expansion of these variables could promote economic growth, but in developing countries, fixed-telephone subscriptions, mobile cellular subscriptions, high-technology exports, and patent applications, residents have a non-linear impact. The study also reveals that economic growth may be linked to other macroeconomic variables, such as tertiary education, labor, and capital. Labor and capital have a positive impact on economic growth in both developing and developed countries, while the non-linear relationship between these control variables and economic growth in developed countries suggests that further development of education, labor, and capital is necessary for sustainable growth. Policy implications and recommendations include improving mobile phone infrastructure and spending more on R&D to ensure sustainable economic growth. Fixed-line telephone subscriptions, which contribute to economic growth in many countries, become smaller in the second regime due to diminishing returns.

This paper examines the distributional impact of regulatory changes in the Mexican mobile sector, focusing on the consequences of reversing policies, particularly asymmetric access charges. The paper suggests that if asymmetric rates are eliminated or reduced before other reform elements take root, poorer households may be the primary losers from the market's return to dominance by one operator. The asymmetry provision is a notable exception, making it more plausible that a significant part of the effects is linked to it. The static approach suggests that the entire process would reverse, with entrant costs rising, preponderant revenues rising,

and competition weakening and becoming more uneven. If the asymmetry were abated, more modest adverse effects on competition might be observed.

This paper highlights the significance of institutional and macroeconomic features in understanding the evolution of developing countries' telecommunications industry over the past two decades. The study identifies key determinants of the three main policy initiatives: competition, privatization, and the restructuring of regulation. The econometric analysis of 86 developing countries shows that sectoral, institutional, and financial factors are important determinants of the actual reforms implemented. Digital technology is more appealing due to capacity constraints, which allow for more users within the same coverage area and more information can be sent and received. Digital technology is less prone to interference and has better privacy and security attributes. The study found a positive relationship between the decision to introduce competition in the digital cellular segment and the growth of the fixed-line segment, while a negative relationship was found between the decision to introduce competition in the analogue cellular segment and the growth of the fixed-line segment. The positive effect of competition in the cellular market on the fixed service market may mainly reflect the impact of competition in the digital cellular segment. Countries facing increasing institutional risk and financial constraints are more likely to introduce competition in the digital cellular segment and privatize the fixed-line incumbent, which enhances the deployment of fixed-line infrastructure. In contrast, competition in the analogue cellular segment and the creation of a separate regulator are less likely to be introduced in countries facing increasing institutional risk and budget constraints. The results highlight the importance of the quality of the institutional environment and the state of the government's finances in determining the implemented reforms.

This paper investigates the link between telecommunications infrastructure investment and economic growth, assessing its impact on the economy and 12 industrial sectors. Results show that telecommunications productivity has outpaced the overall productivity level over a 34-year period. Telecommunications has contributed to overall economy-wide productivity growth through its influence on other industries. The research also highlights the interdependence of telecommunications and other sectors, with all industries benefiting from advances in technology. Encouraging infrastructure competition may improve organizational performance and productivity within the telecommunications industry, facilitating economic development and growth in other sectors.

This article presents a method for measuring impact in remote aboriginal communities, focusing on community engagement and monitoring. The approach involves combining quantitative tools, participatory planning using conventional tools, and video testimonials. The cost of delivering telemedicine services is estimated to be as much as \$985 per client-session, which is significantly less than the overall cost of delivering services by flying clients to regional First Nations counseling centers. The extent of these savings will be translated into improved and continued support to the community's remains to be seen. The cost of tracking indicators remains undefined, but this may provide an opportunity for creativity and innovation. The measurement approach is associated with a national-stature demonstration

project, with significant policy implications for future programs in remote aboriginal communities. The low population density of remote communities may lead to substantial savings for agencies providing services, as well as community-level benefits that can translate into savings in other remedial programs. The authors believe that this combination of methods captures the impact at different levels and through multiple perspectives of stakeholders involved.

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