Financial Analysis and Determination of Claw-back Mechanism on the Implementation of "Large-Scale Deployment of Digital Infrastructure" (P-18) Investment of The National Recovery and Resilience Plan of the Republic of Bulgaria

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Executive Summary

The financial analysis focuses on several critical components, including the current state of digital connectivity across various regions and the strategic implementation of financial mechanisms designed to foster digital inclusion and robust infrastructure growth.

Key Findings from Regional Coverage Mapping

Digital Disparities: There are significant disparities in digital access across Bulgaria, particularly between urban and rural areas. While some regions show high levels of 4G coverage, 5G penetration remains minimal, particularly in rural areas. For instance, the North-West Region shows only 2% coverage of 5G despite 90% coverage of high-speed 4G. Similarly, the North-East Region, while better at 5%, still requires substantial infrastructure upgrades to achieve comprehensive digital inclusion.

Infrastructure Needs: The analysis emphasizes the urgent need to enhance 5G capabilities through robust fiber-optic backhaul systems. Such enhancements are deemed crucial not only for elevating service reliability and speeds but also for supporting economic activities and essential services across regions.

Financial Aid Absorption Rates and Measures to Limit Competition Distortion

Absorption rates: Rates of absorption are crucial to understanding the efficiency of financial aid deployment. The analysis suggests that adherence to project timelines, efficiency of grant utilization, and the capacity of beneficiaries significantly influence the absorption rate. Effective project management and regulatory efficiency are vital for maintaining the momentum of fund utilization.

Competition Distortion: To mitigate potential negative effects on competition, measures such as transparent and competitive tender processes, clear eligibility criteria, robust claw-back mechanisms, and regular monitoring have been instituted. These measures ensure that financial aid fosters fair competition and prevents over-dependence on state aid

Financial Strategy and Reasonable Profit

Financial Aid Utilization: The project employs a gap funding model through direct grants, focusing on maximizing coverage in "white zones" where market failures have left significant gaps. The total budget and aid intensity are strategically aligned with the costs and economic challenges specific to deploying infrastructure in targeted rural and underserved areas.

Cost Eligibility and Management: Costs associated with infrastructure development, such as civil engineering, equipment, and staff, are meticulously categorized to ensure they align with the project's strategic goals. Importantly, the project also sets conditions to prevent the misuse of funds and ensure long-term sustainability.

WACC and Profit Calculations: The financial mechanism uses the Weighted Average Cost of Capital (WACC) calculated to determine reasonable profit margins. The calculated pre-tax WACC is adjusted to 6.97%, reflecting a refined approach to local economic conditions and the specific risks inherent in the Bulgarian market. This WACC supports a reasonable profit level set at 11.85%, fostering an environment that encourages efficient operation and cost management.

Claw-back Mechanism

Safeguarding Investments: A claw-back mechanism is designed to prevent over-compensation and ensure that the financial aid benefits the infrastructure development as intended. This mechanism involves rigorous monitoring and annual reviews to adjust any discrepancies between projected and actual costs or profits, thus ensuring fiscal responsibility and the effective use of public funds.

This comprehensive approach not only addresses the immediate needs for digital infrastructure but also sets a framework for sustainable growth and economic resilience, ensuring that all regions of Bulgaria can benefit from high-capacity networks and enhanced digital services.

1. Need For Intervention and Strategic Objectives

1.1. Need For Intervention

In Bulgaria, substantial portions of the population remain unable to connect to high-speed networks, representing a significant barrier to the nation's transition to a gigabit society. This digital divide not only stifles economic and technological growth but also exacerbates rural depopulation across extensive areas. Consequently, the strategic goal is twofold: firstly, to invigorate connectivity in under-served rural locales, and secondly, to ensure universal access to Very High-Capacity Networks (VHCNs) for all Bulgarian citizens.

In 2020, there was a modest advancement in the deployment of fixed broadband infrastructure, with coverage of next-generation high-speed broadband networks increasing marginally from 77% in 2019 to 79%. However, VHCN coverage saw only a slight rise from 42% in 2019 to 43%, with an overall incremental average growth of 2.5 percentage points since 2018. Despite these gains, Bulgaria still significantly trails the European Union averages; broadband penetration in the nation is notably low, with just 59% of households subscribed to such services, compared to the EU average of 77%. Furthermore, Bulgaria lags in the deployment of fixed broadband speeds of at least 100 Mbps, standing at 15% versus the EU average of 34%. This figure represents only a slight year-on-year increase from 11% in 2019. The prevalence of ultra-high-speed (1Gbps) broadband services remains minimal, with only 6.5% of households having access, and none located in remote or rural areas.

The disparity in broadband access between urban and rural areas, which is prevalent across Europe, is influenced by various factors including demographic shifts, employment rates, social status, poverty risk, mobility, access to social services, and economic diversification. Rural and sparsely populated areas, in particular, present economically unviable markets due to limited financial resources and a basic familiarity with digital technology among the population, resulting in a low initial demand for internet services. This socioeconomic backdrop explains the lack of private sector investment in these regions, necessitating state intervention to stimulate both economic growth and technological adoption.

To address these challenges, the deployment of digital infrastructure must be accompanied by initiatives to promote internet benefits, ICT use, and user training. This approach will not only encourage private operators to leverage this infrastructure but will also enhance the competitive offering of retail services. Specific strategies, such as the establishment of broadband connections in state and public institutions in moderately populated areas, the creation of free Wi-Fi zones around public buildings, and the development of local communication nodes linked to national backbone networks, are essential. Additionally, targeted measures to boost digital literacy and promote the use of e-services will stimulate both the supply and demand for broadband-delivered services, thereby bridging the digital divide and fostering a more inclusive digital landscape in Bulgaria.

1.2. Strategic Objectives

There are 2 strategic objectives outlined in the planned intervention for large-scale deployment of digital infrastructure.

Strategic Objective 1: Comprehensive Enhancement of the Unified Electronic Communication Network (UECM)

This objective is centered on the substantial upgrade and expansion of the Unified Electronic Communication Network of the state administration. The plan involves extending the network across all 265 municipal centers to ensure secure, cyber-resilient communications and "clean pipe" internet services, shielded from volumetric DDoS attacks, catering specifically to the requirements of state governance and national security. Furthermore, it aims to provide essential optical transmission capacity to municipal centers and communities within "white zones." These zones represent areas where, due to market failures, broadband services are currently unavailable to residents and local businesses, thereby addressing critical connectivity voids.

Strategic Objective 2: Bridging the Digital Divide through Infrastructure Development

The second strategic objective focuses on mitigating the "digital divide" by fostering the construction of Very High-Capacity Networks (VHCNs) in under-served, sparsely populated, and rural locales. The initiative targets areas particularly affected by infrastructural deficits arising from market inadequacies. Special attention will be directed towards regions lacking dependable regional or local optical connectivity essential for data transmission to key nodal points in regional and municipal cities. These nodes are crucial for terminating IP transit services from international providers and for connecting with neutral peering Internet exchange Points (IXPs), thereby enhancing the overall connectivity framework and enabling inclusive digital access.).

2. Identification And Regional Coverage Mapping

For the project proposal P18 titled "Large-scale deployment of digital infrastructure across Bulgaria" under the Digital Connectivity domain of Pillar 3: Connected Bulgaria within the National Recovery and Resilience Plan (NRRP), a comprehensive mapping of broadband Internet access throughout the country has been conducted. This exercise has generated a current snapshot of both private and public digital infrastructure, alongside service quality, utilizing standard metrics for broadband network mapping. This includes considerations for sectors with specialized needs. The assessment and analysis of communications connectivity and broadband coverage employed a web-based GIS application, integrating data from the Single Information Point (SIP), the Communications Regulatory Commission (CRC), and various telecommunications providers. This approach facilitated the identification of geographic areas slated for enhancement via state aid under the project.

The mapping of mobile networks adhered to the guidelines set forth in the EU Guidelines on State aid for broadband (2023/C36/01). These guidelines align with the directives from the Body of European Regulators for Electronic Communications (BEREC) regarding geographic surveys and network deployments. Several key factors were meticulously considered during the mapping process:

- Optical Connectivity: Assessment of existing optical connectivity to a termination point within a populated area.
- Network Performance Metrics: Analysis of peak time conditions, packet loss, jitter, latency, and throughput, the latter defined per RFC2544 as the maximum data transfer rate achievable on the network.

- Service Consistency: Evaluation of the uniformity in service quality delivered to end-users and the interaction with other concurrent services.
- Environmental Influences: Consideration of how local environmental conditions might impact signal propagation characteristics such as interference and reflections.
- Mobile Network Infrastructure: Focus on segments of the mobile network that incorporate optical cables up to the base station, the highest aggregated spectrum (e.g., 60 MHz), and the most advanced MIMO configurations (e.g., 4x4 MIMO).

The data was compiled with a precision of 100 meters by 100 meters, ensuring detailed and actionable insights for the subsequent deployment of digital infrastructure. This thorough mapping initiative is fundamental to pinpointing specific areas in need of state intervention, thus fostering a more connected and resilient Bulgaria.

2.1. Regional Coverage Mapping Results

The assessment of regional mobile network coverage across Bulgaria reveals a nuanced landscape of 4G and nascent 5G penetration, underscoring the diverse stages of digital infrastructure development among the regions. This detailed mapping is crucial for strategizing the enhancement of connectivity that is imperative for the nation's integration into the gigabit society. Below is an analysis of the mobile network penetration in each region, reflecting their current capacities and highlighting the disparities in digital access:

North-West Region:

- Demographics and Geography: Comprises 51 municipalities with a population of 671,502 spanning an area of 19,092 km².
- Network Penetration:
    - 4G coverage with speeds between 10 - 100 Mbps affects only 8% of the area, while the higher speed bracket of 100 - 1,000 Mbps covers 90%.
    - 5G technology, offering speeds over 1 Gbps, is emerging modestly at 2%.

North Central Region:

- Demographics and Geography: Also includes 36 municipalities, hosting a population of 686,334 over 14,796 km².
- Network Penetration:
    - 4G services at the lower speed tier cover 6% of the region, whereas the higher tier covers 91%.
    - 5G coverage is slightly better than in the Northwestern Region at 3%.

North-East Region:

- Demographics and Geography: Contains 35 municipalities, with a population of 823,884 spread across 14,633 km².
- Network Penetration:
    - The region enjoys a 7% coverage for 4G at 10 - 100 Mbps and 88% for 100 - 1,000 Mbps.
    - 5G accessibility is at 5%, indicating a gradual adoption of advanced network technology.

South-East Region:

- Demographics and Geography: Encompasses 33 municipalities with a total population of 948,410 in an area of 19,784 km².
- Network Penetration:

- 4G coverage stands at 11% for speeds of 10 - 100 Mbps and 85% for speeds of 100 - 1,000 Mbps.
- There is a 4% penetration of 5G, reflecting slow but steady progress in infrastructure development.

South-West Region:

- Demographics and Geography: The largest in terms of population, this region includes 52 municipalities with 2,016,554 residents over 20,330 km².
- Network Penetration:
  - It has the highest coverage of lower-tier 4G at 18%, but lower high-speed 4G coverage at 77%.
  - 5G technology is available to 4% of the area, paralleling the national push towards enhancing high-speed connectivity.

South Central Region:

- Demographics and Geography: Mirroring the South-West Region, it comprises 58 municipalities but with a smaller population of 1,301,026 across a larger area of 22,364 km².
- Network Penetration:
  - Coverage for 4G (10 - 100 Mbps) is at 16%, and for 100 - 1,000 Mbps at 81%.
  - The region matches the national average with a 4% coverage of 5G networks.

As seen from the regional coverage mapping results, the variable degrees of network coverage across Bulgaria's regions highlight significant disparities that need addressing to bridge the digital divide. The gradual rollout of 5G, coupled with the robust presence of high-speed 4G, sets a foundation, but accelerated efforts are essential to equip all regions with high-capacity networks that support Bulgaria’s aspirations for a fully connected and digitally inclusive society.

2.2. Conclusions From the Regional Coverage Mapping Results

The advancement and deployment of 5G networks in Bulgaria, especially in rural areas, is crucial for achieving comprehensive digital inclusion. This technology promises to revolutionize internet connectivity by providing higher speeds, lower latency, and more reliable service compared to 4G. However, the effectiveness of 5G is heavily dependent on the underlying infrastructure, particularly fiber-optic backhaul, which is necessary to handle the increased data loads.

To deliver a comprehensive analysis of the need for strengthening 5G deployment through fiber-optic backhaul for digital inclusion in each Bulgarian region, we need to assess both the current state of connectivity and specific regional characteristics. This approach ensures tailored solutions that address local needs effectively:

North-West Region:

- Digital Infrastructure: Currently, this region has the lowest 5G coverage at 2%, despite having 90% 4G coverage at higher speeds. The stark disparity indicates a significant lag in transitioning to more advanced technologies.
- Challenges: The area's large geographic span and relatively sparse population complicate the economic feasibility of traditional wired solutions.
- Opportunities: Implementing fiber-optic backhaul would drastically increase capacity and reliability, enabling more efficient 5G deployment, which is crucial for supporting rural businesses and remote education.

- Recommendation: Focus on government-backed projects to build out fiber infrastructure, leveraging EU funds where possible.

North Central Region:

- Current State: Slightly better 5G coverage at 3%, with robust high-speed 4G infrastructure.
- Geographic Benefits: The relatively smaller area makes this region potentially more manageable for comprehensive fiber-optic deployment.
- Development Focus: Strengthening the fiber-optic backhaul here could serve as a pilot area for demonstrating the benefits of 5G in rural settings.
- Recommendation: Encourage public-private partnerships to enhance fiber rollout, targeting educational institutions and healthcare facilities for initial upgrades.

North-East Region:

- Technology Adoption: Better 5G penetration at 5%, reflecting early adoption in more densely populated areas or strategic locations.
- Economic Impact: Higher population density correlates with potential economic activities that would benefit from improved connectivity.
- Strategic Importance: Enhancing fiber-optic backhaul is critical not just for residential access but also for supporting emerging industries and tourism.
- Recommendation: Prioritize upgrading existing cell towers with fiber connections and expand new 5G cell sites in underserved areas.

South-East Region:

- Coverage Analysis: 11% coverage at lower 4G speeds and 4% at 5G indicates a gap in high-speed internet availability.
- Population Considerations: As the population approaches one million, there's a substantial need for scalable and reliable internet services.
- Long-Term Planning: Focus on integrating fiber-optic backhaul into all new infrastructure projects to future-proof the network.
- Recommendation: Launch community engagement initiatives to identify key areas for immediate improvement and support local businesses in adopting digital tools.

South-West Region:

- Connectivity Needs: Although 77% of the area is covered by high-speed 4G, the 4% 5G coverage needs urgent expansion given the region's economic role and population density.
- Urban Influence: Proximity to major urban centers suggests a high demand for data services, making robust backhaul essential.
- Recommendation: Use urban areas as hubs to extend fiber-optic networks into rural zones, ensuring that investments in infrastructure also benefit the surrounding rural communities.

South Central Region:

- Rural Focus: Given its vast area and diverse topography, the need for reliable internet is critical for ensuring equitable access to services.
- Infrastructure Gaps: The current 4% 5G coverage is insufficient to meet the needs of its over 1.3 million residents, particularly in remote areas.
- Recommendation: Develop targeted programs for fiber expansion in this region, focusing on areas that could serve as economic and social hubs (e.g., community centers, schools).

The transition to 5G supported by robust fiber-optic backhaul is essential for fostering sustainable economic growth and digital inclusion across Bulgaria. Each region requires a tailored approach that considers its demographic, economic, and geographic particulars. Strategic investment in fiber infrastructure, coupled with regulatory support and community involvement, will be crucial in ensuring that rural and semi-urban areas are not left behind in the digital era.

3. Intervention Model, Duration, Budget and Aid Intensity

The financial aid for this initiative will be administered through a gap funding model, employing direct grants awarded to selected undertakings via a competitive selection process. The grants provided will constitute [a predefined percentage] of the total eligible costs incurred. The infrastructures developed under this program will be entirely owned by the beneficiaries.

The total budget allocated for this financial aid is outlined in the National Recovery and Resilience Plan, with funds expected to be available until a specified date. The financial aid is designed to cover up to a specified maximum percentage of the eligible costs related to the construction of the infrastructure. This cap represents the highest aid intensity bidders in the tender process may request. The final amount of aid granted will be determined based on the outcomes of the tender process and will not exceed this predetermined aid intensity. The justification for the stipulated aid intensity includes several key factors:

Challenging Geography:

- The orography of the target areas often complicates infrastructure deployment, necessitating substantial investment.
- The geographic challenges inherent in these regions escalate the costs associated with establishing and securing necessary infrastructures.

Low Profitability in Target Areas:

- Many of the targeted areas are located in rural and remote parts of the country, characterized by low population density.
- This demographic factor is crucial, particularly given the high operational costs associated with mobile networks, such as maintenance and electricity, which diminish the areas' profitability.

Need for Further Investment:

- There is a significant requirement for additional investment in active equipment essential for realizing the full potential of the deployed solutions.

These factors collectively underscore the economic challenges faced in these areas, impacting the viability of investments needed to develop the infrastructure. The increased costs and reduced revenue potential compared to similar projects in more densely populated regions justify the need for higher aid intensity to ensure the successful implementation and sustainability of the infrastructure projects.

4. Cost Eligibility, Justification and Verification

The scope of cost eligibility for financial aid under this initiative is meticulously defined to ensure a structured and accountable deployment of the infrastructure, specifically focusing on the passive components of the fiber-based backhaul network essential for connecting base stations.

4.1. Eligible Costs

The following categories are designated as eligible for financial aid, as they are critical to the deployment of both passive and active components of the infrastructure:

- Infrastructure and Civil Engineering: Includes all construction and civil engineering works necessary for laying fiber optic cables and installing related infrastructure.
- Equipment and Materials: Encompasses all hardware and materials required for the operation of the network, such as fiber optic cables, network interface devices, and other elements necessary for fiber lighting and data traffic management.
- Staff Costs: Covers salaries and wages of personnel directly involved in the project, from the planning and engineering phases through to the execution and operational stages.
- Additional Expenditures: Encompasses a broad range of ancillary costs including project preparation, permit acquisition and management, and procurement of equipment strictly necessary for project execution.

Additionally, costs associated with establishing irrevocable rights of use (IRUs) for the connection of the base stations are recognized as eligible. These expenditures are critical for securing long-term access to the infrastructure necessary for network operation.

4.2. Exclusions from Eligibility

However, there are specific exclusions within the eligibility criteria to ensure that the aid is utilized strictly for the intended purpose of enhancing network infrastructure:

- Legal and Regulatory Obligations: Costs incurred in fulfilling legal obligations or investments required to meet coverage obligations associated with the rights of use of spectrum are not covered by this financial aid. This stipulation ensures that the aid is not used to offset costs that should be covered by the spectrum license holders themselves.
- Coverage Obligations: Infrastructure developed with the aid of this financial support will not count towards meeting any coverage obligations tied to spectrum usage rights. Additionally, the call for tenders will mandate that aid beneficiaries formally commit in writing not to report the deployment of this infrastructure for fulfilling such coverage obligations.

These cost eligibility guidelines are designed to facilitate a transparent, efficient, and effective allocation and use of financial resources, thereby fostering the development of a robust and reliable digital infrastructure.

4.3. Justification and Verification

To ensure transparency and prudent financial management in the allocation and utilization of financial aid, a robust justification and verification framework must be established. This framework will facilitate the thorough review and validation of all expenses and payments associated with the financial aid. The following actions should be incorporated as good practice:

Verification of Supporting Documents

- Validation Against Originals: It is imperative to check that all supporting documents for expenses and payments correspond to the original documents. This verification ensures authenticity and compliance with the relevant regulatory frameworks. Each document must be scrutinized to confirm it adheres to the specified guidelines and requirements.
- Compliance with Regulatory Requirements: The nature, quantity, and characteristics of the expenditures must be examined to ensure they align with the purposes for which the grant was awarded. This verification involves comparing expenditures with the regulatory bases, the specific call for applications, and the award resolution. The results of this verification should be meticulously documented, detailing any discrepancies or issues identified.

Consistency and Timing of Expenditures

- Eligible Period Verification: All expenditures and payments must be verified to ensure they are consistent with the commitments made, and that they are both incurred and paid within the eligible period. This step prevents the inclusion of ineligible expenses and ensures timely financial reporting and management.

Competitive Procurement Processes

- Procurement Procedures for Significant Expenditures: For eligible expenditures exceeding EUR 50,000 for works and EUR 20,000 for other contracts, it is essential that the beneficiary requests at least three offers from different suppliers before signing contracts. The selection should be based on criteria of efficiency and economy. The economic report of the supporting account must explicitly justify the choice of supplier, particularly when the selected offer is not the most economically advantageous. This practice promotes competitive bidding and cost-effectiveness in procurement.

Accurate and Detailed Accounting

- Consistency in Accounting Records: The beneficiary's accounting records must accurately reflect the revenue and expenditure related to the supported activity, including the payment of such expenditure. It is crucial to verify that these records are properly maintained and consistent with the financial transactions of the project.
- Detailed Accounting Practices: Beneficiaries must maintain detailed accounts that clearly identify the expenditure subject to the grant. This involves using differentiated accounts or sub-accounts to allow for adequate control of all transactions related to the subsidized project. Such detailed accounting ensures transparency and facilitates easier auditing and verification processes.

Avoidance of Double Funding

- Verification of Exclusive Funding: It is necessary to confirm that the beneficiary has not received other aid for the same project. This prevents double funding and ensures that the financial aid is used exclusively for the intended purpose. The verification process must include a thorough review of the beneficiary's funding sources to identify any overlaps or duplications.

By implementing these justification and verification measures, the financial management of the aid becomes more transparent, accountable, and efficient. These practices not only ensure compliance with regulatory requirements but also promote the prudent use of public funds, thereby enhancing the overall integrity of the financial aid program.

5. Beneficiaries Obligations and Conditions

The entities awarded tenders for the deployment of infrastructure within the designated target areas will be recognized as the beneficiaries of the financial aid. These undertakings are entrusted with a crucial role in advancing the regional digital infrastructure and are subject to specific obligations and conditions to ensure the broad and equitable dissemination of the aid's benefits.

Obligations of the Aid Beneficiaries

- Provision of Access to Passive Infrastructure: Beneficiaries are required to provide other operators with unrestricted access to the passive infrastructure they deploy. This access should be granted indefinitely from the date the infrastructure is completed. The intention behind this stipulation is to maximize the utility of the funded infrastructure by enabling a wider range of service providers to deliver telecommunications services, thereby enhancing competitive market conditions.
- Conditions for Infrastructure Access: Access to this infrastructure must be provided under conditions that are transparent, fair, and non-discriminatory. This framework ensures that all potential users have an equal opportunity to utilize the infrastructure, fostering an inclusive market environment. Consequently, access seekers indirectly benefit from the financial aid as they can avail themselves of wholesale access services without direct participation in the funding initiative.
- Operational Duration Requirement: Beneficiaries are mandated to operate the financed infrastructure for a minimum duration of [twenty years] following the project's completion. This long-term operational commitment ensures the sustained availability and maintenance of the infrastructure, thereby securing ongoing benefits from the initial investment.
- Continuity of Access Obligations: The obligations to provide access to the infrastructure remain binding regardless of any changes in the ownership, management, or operational control of the infrastructure. This condition guarantees that the infrastructure continues to serve its intended public and economic benefit, irrespective of corporate restructuring or ownership transfers.

Restrictions and Exclusions

- Compliance with Previous Aid Regulations: Financial aid will not be extended to any undertaking that has previously received unlawful aid, which was declared incompatible by a decision of the Commission, unless such undertaking has reimbursed the total amount of the incompatible aid, along with accrued recovery interest, into a blocked account.
- Exclusion of Undertakings in Difficulty: In line with the “Guidelines on State aid for rescuing and restructuring non-financial undertakings in difficulty”[1] aid will not be granted to undertakings that are currently facing significant financial hardships or operational challenges. This exclusion ensures that the aid is allocated to entities that are stable and capable of fulfilling the long-term commitments required by the aid conditions.

These structured obligations and conditions are designed to ensure that the deployment of infrastructure through financial aid effectively contributes to the digital advancement of the targeted regions, maintaining integrity and sustainability throughout the operational lifecycle of the infrastructure.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52014XC0731%2801%29

6. Absorption Rates and Measures to Limit Competition Distortion

Rates of absorption and need for measures to limit competition distortion have strong interlink between. To analyze the rates of absorption of the financial aid within the context of the potential negative effects of competition, it's crucial to consider both the deployment strategies and the specific measures implemented to mitigate any distortive effects on competition.

6.1. Financial Aid Absorption Rates

There are several factors that needs to be analyzed in the context of financial aid absorption rates. It is important to follow the effectiveness and efficiency of aid utilization in the deployment of broadband infrastructure.

Project Implementation Timelines:

- The rate at which financial aid is absorbed is highly dependent on the adherence to detailed project timelines. Delays in project milestones due to logistical, regulatory, or technical issues can significantly slow down fund absorption.
- Effective project management, timely procurement, and adherence to scheduled activities are essential for maintaining the momentum of fund utilization.

Efficiency of Grant Utilization:

- The absorption rate is also influenced by how efficiently the grants are utilized by the recipients. This includes the adequacy of the financial resources allocated towards various project components such as civil works, technological equipment, and human resources.
- Overestimations or underutilizations can lead to discrepancies in planned versus actual spending, affecting the overall absorption pace.

Capacity of Beneficiaries:

- The technical and administrative capacity of the entities receiving the aid plays a critical role in determining the absorption rate.
- Beneficiaries with robust project management capabilities, experience in large-scale infrastructure projects, and adequate financial handling skills are more likely to utilize the funds effectively within the given timelines.

Regulatory and Administrative Efficiency:

- The bureaucratic processes involved in disbursing funds and approving project stages can either facilitate or hinder the quick absorption of financial aid.
- Simplified procedures, clear regulatory guidelines, and efficient administrative support from government bodies are crucial for smoothing the flow of funds.

Monitoring and Evaluation Mechanisms:

- Regular monitoring and rigorous evaluation of project progress and financial management practices help in identifying bottlenecks early and adjusting strategies accordingly to enhance fund absorption.
- These mechanisms ensure that funds are being used as intended and help in making necessary adjustments to project plans or fund allocations.

Flexibility of Funding Mechanisms:

- The ability to adjust funding allocations based on evolving project needs without lengthy bureaucratic processes can significantly affect the absorption rate.

- Dynamic funding mechanisms that allow for reallocation of resources between project components based on real-time needs and challenges can lead to more efficient use of financial aid.

Impact of External Factors:

- External factors such as economic conditions, changes in technology, and market dynamics can influence the rate at which financial aid is absorbed.
- For instance, a sudden increase in the cost of materials or labor can lead to underspending or the need for additional funds, thereby affecting the absorption rate.

By focusing on these aspects, the authorities can ensure that financial aid not only meets its intended developmental goals but also maintains a high rate of absorption, maximizing the impact of the investment and ensuring that the projects contribute positively to the technological and economic landscape of Bulgaria.

6.2. Measures to Limit Competition Distortion

The financial aid described in the document is primarily focused on bridging digital divides by promoting infrastructure development in underserved areas. This inherently carries a risk of distorting competition by potentially providing an unfair advantage to selected companies receiving the aid, altering market dynamics unfavorably, and deterring private investment. Therefore, specific measures will need to be taken in order to limit potential distortion of competition:

Transparent and Competitive Tender Processes:

- Ensuring that the allocation of financial aid and selection of beneficiaries is conducted through transparent and competitive tendering processes.
- This approach minimizes the risk of favoritism and ensures that the most capable and efficient service providers are chosen, fostering a fair competitive environment.

Setting Clear Eligibility Criteria:

- Establishing stringent and transparent eligibility criteria for potential beneficiaries can ensure that only undertakings capable of fulfilling the long-term goals of the projects are selected.
- This also prevents companies that have previously received incompatible aid or are financially unstable from gaining an undue advantage.

Claw-back Mechanisms:

- Implementing robust claw-back mechanisms as described in this document ensures that any excess aid beyond the reasonable profit margin is returned.
- This discourages firms from becoming overly dependent on state aid and encourages them to operate efficiently.

Monitoring and Compliance:

- Regular monitoring of the beneficiaries and strict compliance checks can prevent the misuse of aid.
- This includes ensuring that funded infrastructures are not used to fulfill coverage obligations already mandated by regulatory authorities, thereby preventing double-dipping and ensuring aid is used as intended.

Limiting Market Distortion through Gradual Deployment:

- Gradual and phased deployment of infrastructure projects can help in assessing their impact on competition periodically.
- This allows adjustments in policy or strategy to minimize any unforeseen adverse effects on the competitive landscape.

Encouraging Market Entry and Reducing Barriers:

- The aid scheme should be designed to lower entry barriers for new entrants and smaller players by providing them access to critical infrastructure.
- This can be achieved by mandating beneficiaries to offer wholesale access to their infrastructure under fair, reasonable, and non-discriminatory terms.

Economic and Market Studies:

- Conducting periodic economic and market studies to assess the impact of the aid on competition.
- These studies can help in understanding market dynamics and adjusting aid policies to mitigate any negative impacts effectively.

By integrating these measures, the aid program can enhance its effectiveness while safeguarding competitive conditions in the Bulgarian telecommunications market. These strategies align with EU guidelines on state aid, which emphasize preventing market distortion while fostering economic development through judicious use of public resources.

7. Determination of Reasonable Profit through WACC Methodology

In the context of providing financial aid for infrastructure deployment within the telecommunications sector, the determination of reasonable profit is essential to ensure balanced economic incentives and safeguard the sustainability of investments. The Bulgarian Communications Regulation Commission (CRC) employs sophisticated financial models, specifically the Weighted Average Cost of Capital (WACC) and the Capital Asset Pricing Model (CAPM), as foundational frameworks to derive reasonable returns on assets within cost models. These models are critical when setting prices for access to and use of channel networks, particularly in the market for access to passive (physical) infrastructure.

Application of WACC in Regulatory Pricing

The WACC is universally recognized for its effectiveness in calculating the cost of capital for businesses, particularly in regulatory environments where entities are mandated to apply cost-oriented pricing strategies. This approach facilitates the establishment of fair and economically justified price ceilings for services, ensuring that providers can cover their capital costs while maintaining reasonable profit margins. This method is not only recommended but also widely implemented by the European Commission and various regulatory bodies across Europe, underscoring its reliability and relevance.

European Commission's Involvement and Standardization Efforts

Recognizing the disparities in WACC calculation methodologies across Member States and the potential adverse effects on investment incentives within the Digital Single Market, the European Commission has been proactive. In November 2019, the Commission issued a Notice on the calculation of capital expenditure on existing infrastructure, specifically addressing national notifications within the electronic communications sector of the EU. This Notice clarifies the methodology for calculating WACC parameter values and standardizes the assumptions used in these calculations.

The Commission’s directive aims to harmonize the regulatory practice across the EU, thereby fostering a more consistent and convergent environment for investments in electronic

communications networks. This standardization is crucial for eliminating potential barriers that could impede the development of the internal market and ensuring a level playing field for all market participants.

CRC's Implementation of EC Guidelines

In alignment with the European Commission's directives, the CRC adopts the methodologies outlined in the EC Notice for its regulatory practices. The CRC further refines its approach by integrating data from BEREC's WACC Parameters Report 2023, which offers the latest insights and parameters essential for the accurate determination of WACC. This meticulous approach ensures that the parameters used are reflective of current economic conditions and industry standards, thereby enhancing the accuracy and relevance of the cost models employed.

Through the careful application of these sophisticated financial and regulatory models, the CRC endeavors to support the development of a robust telecommunications infrastructure in Bulgaria. This approach not only aligns with European standards but also promotes fair competition and stimulates continued investment in the nation's digital infrastructure, pivotal for advancing Bulgaria's position within the Digital Single Market.

7.1. Calculation of WACC

In the intricate process of setting access prices for passive (physical) infrastructure, specifically the underground duct network, CRC adheres to a sophisticated financial methodology dictated by European standards. This involves calculating the WACC, a critical financial metric used to ensure that pricing models are economically viable and reflective of the prevailing market conditions. The CRC's approach to determining WACC values is aligned with the European Commission's Notice on WACC dated 6 November 2019, and leverages the comprehensive guidelines set forth in BEREC's fourth report published in June 2023, the "WACC Parameters Report 2023"[2] (WACC Parameters Report 2023).

Calculation of WACC Parameters by BEREC

The Body of European Regulators for Electronic Communications (BEREC) plays a pivotal role in standardizing the calculation of WACC across the EU, ensuring a harmonized approach that aligns with the European Commission's directives. The WACC Parameters Report 2023 issued by BEREC offers a detailed breakdown of essential financial parameters necessary for calculating WACC:

General Economic Conditions:

- Risk-Free Rate of Return (RFR): This parameter is critical as it represents the return on investments perceived as risk-free, such as government bonds. BEREC estimates the RFR for each EU member state, providing a foundational economic indicator that reflects the baseline return investors would expect without any risk.
- Equity Risk Premium (ERP): The ERP accounts for the additional return that investors demand over the risk-free rate to compensate for the risk associated with investing in equity. This parameter is crucial for adjusting the cost of equity to reflect the specific risk profile of the telecommunications sector.

Parameters Specific to a Peer Group:

[2] BoR (23) 90, of 8 June 2023, https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-wacc-parameter-calculations-according-to-the-european-commissions-wacc-notice-of-6th-november-2019-wacc-parameters-report-2023

- In its robust analysis, BEREC identifies a 'peer group' of 15 companies deemed comparable based on criteria outlined in the EC Notice. This peer group provides a relevant benchmark for evaluating financial metrics in the telecommunications infrastructure sector.
- Beta Ratios of Equity: Each company's beta ratio is assessed, which measures the volatility of a company's stock in relation to the market. This indicator is vital for understanding the risk inherent in investing in these companies compared to the broader market.
- Degree of Indebtedness: The proportion of debt in a company's capital structure is calculated, providing insight into the financial leverage and risk profile of the company.
- Debt Premium and Cost of Debt: These parameters estimate the additional cost that a company bears for taking on debt over risk-free securities, reflecting the perceived risk of lending to the company.

Peer group companies identified in the BEREC report as at March 31, 2023:

Operator	State	S&P Rating
Deutsche Telekom AG	DE	BBB
DIGI Communications N.V.	RO	BB-
Elisa Oyj	FI	BBB+
Koninklijke KPN N.V.	NL	BBB
NOS	PT	BBB-
Orange S.A.	FR	BBB+
Proximus S.A.	BE	BBB+
Tele 2 AB	SE	BBB
Telecom Italia	IT	B+
Telefónica	ES	BBB-
Telekom Austria AG	AT	A-
Telenet Group Holding N.V.	BE	BB-
Telenor	NO	A-
Telia Company AB	SE	BBB+
Vodafone Group plc	UK	BBB

The post-tax WACC formula includes the following elements:

WACC = Re*E/ (D+E) + Rd*D/ (D+E) * (1-t)

Where:

- **Re (Cost of Equity)**: This is the return that equity investors expect on their investment in the company. It compensates the investors for the risk undertaken in investing their capital.
- **Rd (Cost of Debt)**: This is the effective rate that a company pays on its current debt. Unlike cost of equity, cost of debt is typically lower due to its precedence in repayment during liquidation and its tax-deductibility.
- **D (Market Value of Debt)**: Represents the total value of a company's debt. In financial models, using the market value of debt rather than its book value provides a more accurate reflection of the economic reality.

- **E (Market Value of Equity)**: Reflects the total value of the company's equity, calculated as the current market price per share multiplied by the total number of outstanding shares.
- **G (Gearing Factor)**: Also known as the leverage ratio or financial leverage, this ratio D/(D+E) indicates the proportion of debt in the company's capital structure relative to its equity. It is a critical indicator of the company's financial stability and risk profile.
- **t (Marginal Corporate Tax Rate)**: This is the rate at which the company's additional income is taxed. The tax rate affects the WACC calculation through the tax shield on debt, which reduces the effective cost of debt to the company.

Application of the Benchmark Method by National Regulatory Authorities

National regulatory authorities, like the CRC, utilize these parameters within the benchmark method to calculate WACC. This method involves comparing the company or sector in question against the established benchmarks from the peer group, ensuring that the WACC reflects both the specific economic conditions and the inherent risks of the industry. This standardized approach facilitates fair, transparent, and consistent pricing practices across the EU for access to critical telecommunications infrastructure.

By integrating these detailed financial analyses and methodologies, the CRC ensures that pricing for access to Bulgaria's passive infrastructure is both competitively fair and economically justified, supporting the broader objectives of investment and development within the EU's Digital Single Market.

In the following parts of the analysis are presented explanations and the values used of all parameters for calculating WACC in accordance with the common methodology.

7.1.1. Calculation of Cost of Debt (Rd)

The cost of debt (Rd) is a pivotal financial metric used to assess the effective rate they pay on their borrowed capital. This rate encapsulates the expense of utilizing debt as a form of financing, including interest or financial charges incurred on outstanding borrowings. Accurately calculating the cost of debt is essential for enterprises as it influences financial strategies, impacts corporate finance decisions, and is crucial for investment evaluations.

The cost of debt is calculated using a formula that integrates both the risk-free rate of return and an additional debt premium that accounts for the credit risk associated with the borrowing entity:

Rd = RFR + Debt Premium

Where:

- **RFR (Risk-Free Rate of Return)**: This is the theoretical rate of return of an investment with zero risk, representing the interest an investor would expect from an absolutely risk-free investment. The risk-free rate is typically derived from the yield on government securities, such as treasury bonds, which are considered free from credit risk because they are backed by the monetary authority of the country.
- **Debt Premium**: This component reflects the additional return that lenders require to compensate them for the risk undertaken beyond the risk-free rate. The debt premium varies according to the borrower's creditworthiness, market conditions, and the overall economic environment. It is influenced by factors such as the company's credit rating, financial health, and the perceived risk of default. A higher debt premium indicates a higher perceived risk associated with lending to the company.

7.1.1.1. Risk-free Rate of Return (RFR)

The Risk-Free Rate of Return (RFR) is a fundamental component in the financial modeling of cost-setting, particularly within regulated industries such as telecommunications. The RFR serves as the baseline rate from which additional risks are measured, representing the minimum return investors would expect from an absolutely risk-free investment. Financially, risk is characterized by the variability or deviation of actual returns from those that are expected. An ideal risk-free asset is one where the actual returns are consistently equivalent to the expected returns, devoid of any risks pertaining to default or reinvestment.

In the telecommunications sector, the RFR is critical for aligning the profitability of investments with the depreciation timelines of telecom assets. These assets typically have prolonged operational lifespans, necessitating the use of long-term financial benchmarks. Typically, zero-coupon government securities, which do not entail interim cash flows and are backed by the sovereign assurance of governments, are utilized as proxies for risk-free investments in this context.

Following the guidelines established in the European Commission Notice, CRC calculates the RFR based on the yield of Bulgarian government bonds that have a ten-year maturity. This methodological approach is detailed in the WACC Parameters Report 2023, which outlines that the risk-free premium was determined to be 0.76%[3] based on an average monthly yield observed over a five-year period from April 2018 to March 2023. These calculations incorporate long-term interest rates issued for convergence purposes by both the Bulgarian National Bank (BNB) and the European Central Bank.

Acknowledging the dynamic nature of economic conditions, such as the recent uptrend in government bond yields driven by escalating interest rates, the CRC has adapted its observation period to enhance the relevance and accuracy of its RFR estimation. The updated observation period now spans from January 2019 to December 2023. Reflecting these macroeconomic shifts, the recalculated RFR for Bulgarian government bonds with a remaining ten-year maturity has been adjusted to **1.23%**[4].

7.1.1.2. Debt Premium

The debt premium represents the additional return that creditors or investors require from a company over and above the risk-free rate to compensate for the risk of lending. This premium is crucial in financial models as it directly influences the cost of capital and, by extension, the pricing strategies in regulated sectors such as telecommunications. The magnitude of the debt premium is primarily influenced by the perceived credit risk and the credit rating of the company. Typically, the debt premium is derived by analyzing the yields on corporate bonds relative to those on long-term government bonds, which act as the benchmark for the risk-free rate.

BEREC adheres to a standardized method for calculating the debt premium, which involves assessing the yield on long-term corporate bonds of each company within the designated "peer group" relative to the risk-free norm. This assessment effectively captures the additional risk perceived by investors in lending to these corporations compared to sovereign debt.

The primary data source for this analysis is Bloomberg, a widely recognized platform in the financial and corporate sectors, known for its comprehensive and reliable financial data. According to the European Commission's guidelines, the specific risk or debt premium for each company is quantified as the difference between the yield on the company's 10-year

[3] BoR (23) 90, page 55 https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-wacc-parameter-calculations-according-to-the-european-commissions-wacc-notice-of-6th-november-2019-wacc-parameters-report-2023

[4] https://www.bnb.bg/Statistics/StMonetaryInterestRate/StInterestRate/StIRKeyIRAndYieldOnGS/index.htm

bonds and the yield on 10-year government bonds from the country where the company is headquartered. Subsequently, an arithmetic mean of these differences is calculated for each entity within the peer group.

CRC utilizes the debt premium data from all 15 enterprises identified by BEREC within the "peer group". This approach ensures a robust analysis by covering a diverse array of enterprises operating across multiple countries, which helps in mitigating the risks associated with economic and political fluctuations.

The calculated debt premium used by the CRC in its financial models is the arithmetic mean of all the debt premiums determined for the peer group. As reported in BEREC's WACC 2023 Parameters Report, this mean is 148 basis points, or **1.48%**[5].

Combining this calculated debt premium with the risk-free rate of return, the CRC computes the total cost of debt (Rd). With the risk-free rate previously recalculated at 1.23%, the total cost of debt is determined by summing this risk-free rate with the debt premium. Therefore, the total cost of debt (Rd) utilized by the CRC is **2.71% (Rd = RFR + Debt Premium).**

7.1.2. Calculation of Cost of Equity (Re)

The cost of equity is a critical component in the financial analysis of regulated industries like telecommunications. It represents the return that investors require to compensate them for the risk of investing in a company's equity. Accurately calculating this cost is essential for setting fair rates that can cover the company's cost of capital while promoting sustainable investment.

Application of CAPM in Regulatory Financial Models

CRC employs the Capital Asset Pricing Model (CAPM) to calculate the cost of equity, following guidelines stipulated in the EC Notice. CAPM is widely recognized for its robust theoretical foundation and its straightforwardness in application, making it the preferred choice among national regulators for estimating the cost of equity.

The CAPM is based on the premise that the expected return on an asset (in this case, equity) should be commensurate with its risk level relative to the market. This model is particularly advantageous because it delineates the relationship between risk and return in a clear and quantifiable manner, facilitating transparent regulatory practices.

The formula used to calculate the cost of equity via CAPM is expressed as follows:

Re = RFR + β* ERP

Where:

- **Re** represents the cost of equity.
- **RFR (Risk-Free Rate)** denotes the yield on risk-free investments, typically government bonds, which serves as a baseline return that investors would expect from an entirely risk-free investment.
- **β (Beta)** is the equity beta factor, also known as the geared beta. This metric measures the volatility or systemic risk of a company's stock in comparison to the market as a whole. A higher beta indicates greater volatility and, consequently, a higher risk associated with the investment.
- **ERP (Equity Risk Premium)** reflects the additional return over the risk-free rate that investors require to invest in the market as a whole rather than in risk-free securities. This premium compensates investors for taking on the higher risk associated with equity

[5] BoR (23) 90, page 26 https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-wacc-parameter-calculations-according-to-the-european-commissions-wacc-notice-of-6th-november-2019-wacc-parameters-report-2023

investments compared to risk-free assets.

7.1.2.1. Risk-free Rate of Return (RFR)

The methodology for calculating the risk-free rate of return is presented in item 6.1.1.1. in the part related to the cost of debt, the value being **1.23%.**

7.1.2.2. Beta Coefficient (β)

The beta coefficient (β) is a financial metric that measures the volatility - or systematic risk - of an entity's shares relative to the broader market. It is an essential factor in the CAPM, where it helps to determine the equity risk premium and, consequently, the pricing of equity. Essentially, beta reflects how sensitive a company's stock price is to market movements, indicating the extent to which the returns on a company's equity are expected to fluctuate in relation to a market index.

Beta exclusively measures systemic risk, which is the type of risk inherent to the entire market or market segment. This risk cannot be mitigated through diversification alone, unlike unsystematic risk, which is specific to a single asset or company. Systemic risks might include macroeconomic factors such as inflation rates, exchange rates, political instability, or significant economic downturns. The calculation of beta is thus critical for investors and financial analysts as it provides a quantifiable measure of inherent market risk that an investment carry.

Beta is typically estimated through regression analysis, which assesses the relationship between the returns on an operator's shares and the returns on a broad market index. For regulatory purposes and broader financial analysis within the telecommunications sector, CRC utilizes the STOXX Europe TMI stock index (STOXX)[6] as a benchmark. This index provides a comprehensive measure of the European stock market performance, making it an appropriate benchmark for evaluating systemic risk.

The CRC, along with data published by BEREC, estimates the beta coefficients and the respective levels of financial indebtedness of 15 companies within a defined "partner group." The beta coefficients are derived from stock price data collected on a weekly basis, which is compared against the performance of the STOXX index. This data is sourced from the Bloomberg database, ensuring high standards of accuracy and reliability in the financial metrics used.

The values for the beta coefficient and the financial indebtedness ratio are computed as averages over a recent five-year period, from April 1, 2018, to April 1, 2023. These averages are based on weekly values to capture a more nuanced and dynamic understanding of market movements and company performance.

When integrating these values into financial models, the CRC considers the average beta values of all 15 companies within the peer group. For the purposes of determining the WACC, a beta value of **0.64**[7] is utilized. This figure reflects a relatively moderate level of market risk, indicating that the returns on the operator's equity are less volatile than those of a higher beta stock. The use of this beta value is instrumental in calculating the cost of equity, thereby

[6] STOXX Europe TMI covers approximately 95% of the free movement of European market capitalisation in 17 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

[7] BoR (23) 90, page 37 https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-wacc-parameter-calculations-according-to-the-european-commissions-wacc-notice-of-6th-november-2019-wacc-parameters-report-2023

influencing investment decisions and regulatory assessments within the telecommunications industry.

7.1.2.3. Equity Risk Premium (ERP)

The Equity Risk Premium (ERP) is a critical financial metric that quantifies the additional return investors require for choosing equity over a risk-free asset. This premium compensates investors for the extra risk they undertake when investing in the volatile capital market compared to risk-free investments like government bonds. Understanding and accurately calculating ERP is essential for investment valuation, particularly in environments where risk and return calculations dictate significant financial decisions and regulatory frameworks.

ERP reflects broader economic conditions and is indicative of the market's overall risk appetite. It integrates expectations of future market volatility and the potential for higher returns, which are inherent in equity investments. In simpler terms, ERP represents the price of taking on additional risks associated with the equity market.

The European Commission (EC) advocates for the calculation of a standardized ERP for the entire European Union, leveraging historical data to reflect the integrated nature of EU financial markets. This approach assumes a convergence in the risk premiums across member states, supported by empirical evidence suggesting that financial markets within the EU are increasingly interconnected.

To compute this unified ERP, BEREC (Body of European Regulators for Electronic Communications) utilizes comprehensive datasets including the so-called DMS[8] database, which provides global returns from 1900 to 2022 for 14 EU member states. For member states not covered in this dataset, BEREC supplements with data sourced from Bloomberg, ensuring a comprehensive coverage and robustness in the ERP values calculated.

According to BEREC's findings published in the WACC Parameters Report 2023, the CRC initially considers an average European equity risk premium of 5.92%. However, this average does not necessarily cater to the specific economic environment or equity market conditions within individual countries, such as Bulgaria.

Recognizing the need for precision in regulatory financial models, BEREC also provides country-specific ERP values. For Bulgaria, a significantly higher ERP of **12.23%**[9] is noted, reflecting unique market conditions, possibly including higher market volatility or economic risk factors specific to the region.

Integrating these insights, the CRC employs the CAPM to calculate the cost of equity (Re). This model incorporates the risk-free rate of return (RFR), the beta coefficient (β), which measures the stock's volatility relative to the market, and the specific ERP for Bulgaria using the provided figures.

Based on the calculated values for risk-free rate of return of 1.23%, equity risk premium of 12.23% and beta ratio of 0.64, using the previously mentioned CAPM model, the cost of equity (Re) is derived at **9.06%.** This calculated cost of equity provides a robust estimate that reflects both the general and specific investment risks in Bulgaria. This value is crucial for determining the attractiveness of investments in the telecommunications sector and for setting rates that ensure fair returns on equity while maintaining market stability and investor confidence.

[8] Dimson/Marsh/Staunton (DMS) data published in Credit Suisse's Global Investment Return on 2023 Yearbook by Credit Suisse/London Business School

[9] BoR (23) 90, page 54 https://www.berec.europa.eu/en/document-categories/berec/reports/berec-report-on-wacc-parameter-calculations-according-to-the-european-commissions-wacc-notice-of-6th-november-2019-wacc-parameters-report-2023

7.1.3. Gearing Factor (Financial Leverage)

The gearing ratio, a fundamental metric in corporate finance, measures the proportion of a company's capital financed through debt. It is expressed as the ratio of a company's debt to the total capital (debt plus equity). Mathematically, this is represented by the formula:

G = D / (D + E)

Where:

- **D** represents the total debt,
- **E** signifies the total equity.

This ratio is crucial in assessing the financial leverage of a company, indicating how much of the company's operations are funded by debt versus equity.

The gearing ratio serves as a weighting factor that reflects the relative costs of debt and equity in financing the company's assets. In calculating WACC, the gearing ratio helps determine the optimal capital structure, which is the balance between the cost-effective use of debt (with its tax shields) and equity (which carries no tax advantage but dilutes the risk).

The determination of the actual amounts of debt and equity can vary based on the approach in use:

- Carrying Amounts: Often sourced from annual financial statements, carrying amounts provide a defensible basis for assessing the amount of borrowed capital. However, this method can significantly underestimate the market value of equity, especially in volatile markets or for companies with substantial intangible assets.
- Market Values: Some regulators prefer to use real market data to assess levels of financial leverage. Most method involves calculating the market capitalization for equity and the market-adjusted values for debt, which tends to provide a more dynamic and market-reflective measure of the company's financial leverage.

Regulatory Approaches and International Practices

Different regulatory bodies may apply various methodologies to estimate the gearing ratio and, consequently, the WACC:

- Expert Assessments: Some authorities use expert assessments to determine effective levels of financial leverage, adjusting for perceived market conditions or operational nuances.
- BEREC Benchmark Approach: Consistent with Decision 550/2016, the CRC adopts the BEREC benchmark approach. This methodology involves comparing financial leverage ratios across a group of comparable companies and aligning with ratios used by other regulatory authorities to ensure compliance with international best practices.

Calculation Based on European Market Data

For a robust assessment of indebtedness ratios, data on capital structures over a recent five-year period is utilized:

- Data Source: BEREC calculates these ratios using Bloomberg data, which includes information on long-term debt and market capitalization from April 1, 2018, to April 1, 2023.
- Arithmetic Mean: The average values of financial indebtedness are computed for each company in the comparable group, and an overall arithmetic mean is derived.

Based on this comprehensive analysis, the CRC adopts an average financial indebtedness ratio of **45.36%** as calculated by BEREC. This figure plays a pivotal role in determining the optimal capital structure for electronic communications operators and impacts the WACC calculations, influencing investment decisions and regulatory pricing models within the telecommunications industry.

7.1.4. Marginal Corporate Tax (t)

In the context of WACC, the incorporation of the marginal corporate tax rate is essential because it impacts the after-tax cost of debt. Debt financing provides tax benefits because interest expenses are deductible before determining the taxable profit, thereby reducing the overall tax liability. This reduction in tax enhances the appeal of debt financing over equity, as equity does not offer similar tax shields.

When regulators calculate the WACC, they initially determine the pre-tax cost of capital. This involves summing the costs of debt and equity financing, weighted by their respective proportions in the company's capital structure. To adjust for the tax shield provided by debt financing, the pre-tax cost of debt is multiplied by (1-t), where t is the marginal tax rate. This adjustment reflects the tax savings due to interest deductibility and thus lowers the effective cost of debt.

Currently, the marginal corporate tax rate in Bulgaria is set at 10%. The application of this relatively low tax rate means that the tax shield effect on debt is less pronounced than it might be in higher-tax jurisdictions, but it still represents a significant factor in financial modeling and WACC calculations. The use of the marginal rate, rather than an effective tax rate, ensures consistent and fair treatment across different enterprises, promoting equity and simplicity in regulatory approaches.

By integrating these financial principles and the specific tax considerations, regulatory authorities like the CRC can more accurately and fairly determine the WACC, ensuring that enterprises in the telecommunications sector are able to generate sufficient revenue to cover their cost of capital and maintain healthy profitability after taxes.

7.2. Resulting WACC and Reasonable Profit

In its latest evaluation, the CRC has utilized a comprehensive set of financial parameters to calculate the pre-tax WACC. Initially, a WACC of 4.41% was derived using standard parameters. However, after refining the equity risk premium (ERP) to reflect more localized data specific to Bulgaria, rather than using a broader EU-average, the revised WACC value was determined to be slightly higher at **6.97%.**

This adjustment acknowledges the specific financial environment in Bulgaria, including factors such as market volatility, economic conditions, and investor expectations specific to the region. By utilizing a country-specific ERP, we should be confident that the calculated WACC more accurately reflects the true cost of capital for companies operating within Bulgaria.

Encouraging Efficient Management and Reasonable Profit

To enhance operational efficiency and financial management among companies receiving financial aid, the Bulgarian authorities proposes not only to allow these companies to earn a return equal to the calculated WACC but also to provide an additional incentive. This incentive is [capped at 70%] of the calculated reasonable profit, which is determined based on the WACC. For the current calculation in terms of the financial aid, the reasonable profit including the additional incentive level are calculated at total of **11.85%.**

This policy is designed to motivate beneficiaries of financial aid to optimize their operations and manage their costs effectively. By tying financial incentives to exceeding baseline financial

performance measures, companies are encouraged to pursue efficiency improvements and strategic enhancements that contribute to their long-term financial sustainability.

Implementation and Impact

The implementation of this WACC and the associated reasonable profit incentive structure play a pivotal role in the regulatory framework overseen by the CRC. By setting a WACC that accurately reflects the cost of capital and offering incentives for exceeding this baseline, the Bulgarian authorities aims to foster a competitive, efficient and healthy financial aid for the telecommunications sector in Bulgaria.

This approach not only ensures that companies can attract the necessary capital to fund their operations and expansions but also aligns their interests with those of their investors and the broader economic goals of the region. The result is a balanced regulatory environment that supports both growth and stability in the telecommunications industry.

8. Claw-back Mechanism, Ongoing Monitoring and Compliance

8.1. Claw-back Mechanism

The claw-back mechanism is a pivotal component in the administration of financial aid allocated for infrastructure development, particularly in sectors like telecommunications. Its primary purpose is to prevent over-compensation of aid beneficiaries, ensuring that both the public sector's interests and those of the investors are safeguarded. This mechanism addresses the inherent risks of estimating financial aid on an ex ante basis, intended to cover the anticipated funding gap over the investment's lifespan.

Financial Planning and Tender Submission

- Financial Plan Submission: During the tender process, bidders should be required to present a detailed financial plan. This plan must outline the projected investments and the ongoing operational costs necessary for the infrastructure's deployment and maintenance.
- Profit Forecasting: The financial plan should also project the expected profits over at least a twenty-year period following the project's completion. It needs to specify the aid intensity required to bridge the expected funding gap, ensuring that the financial aid is justified and aligns with long-term sustainability objectives.

Cost and Efficiency Assessment

- Verification of Projected Costs: After the tender process, Bulgarian authorities review the submitted cost projections to ensure they align with what an efficient operator would likely incur under similar circumstances. This step is crucial for confirming that the financial aid is utilized both efficiently and economically.
- Use of WACC as a Benchmark: The WACC, calculated specifically for this financial aid context, is used as a benchmark to assess the reasonableness of the projected returns. This ensures that the financial parameters used are realistic and grounded in current market conditions.

Implementation of the Claw-back Provision

- Recovery of Discrepancies: The claw-back mechanism is actively applied to recover any differences between the projected and actual deployment costs, as well as between the expected and actual profits. This ensures that the aid recipients do not benefit unduly at the expense of the public funds.

- Incentive Structure: Beneficiaries are encouraged to retain a reasonable amount, capped at 70% of the reasonable profit as an additional incentive. This is calculated to be **11.85%**, promoting operational optimization and effective cost management.
- Profit Sharing: Profits exceeding the set incentive threshold are shared equitably between the aid beneficiary and the Bulgarian authorities, based on the actual aid intensity determined during the tender process.

Through these detailed and structured processes, the claw-back mechanism ensures the prudent use of public funds in infrastructure development. It promotes fiscal responsibility and supports the sustainable growth of digital connectivity infrastructure within Bulgaria, aligning with broader economic development goals and ensuring the efficient use of resources.

8.2. Ongoing Monitoring and Compliance

By adhering to these detailed justification and verification measures, Bulgarian authorities can ensure that the deployment of digital infrastructure is conducted efficiently, transparently, and in a manner that supports long-term sustainability and competitive fairness in the broadband sector.

Definition of Reasonable Profit

Reasonable profit is defined as the rate of return on capital that a typical company in the broadband sector would require, considering specific risks and the nature of the services provided. This rate is calculated using the Weighted Average Cost of Capital (WACC), ensuring that the profit margins are fair and reflective of market conditions.

Competitive Pricing

It is essential that pricing for broadband services remains competitive and does not exceed average national rates for comparable wholesale services in the telecommunications market. This prevents monopolistic practices and ensures affordability for consumers.

Accounting Separation

To maintain transparency and facilitate effective monitoring, the aid beneficiary must maintain distinct accounting records for infrastructure deployment costs and revenues. These records must be separate from other business activities, ensuring that the financial aid is used exclusively for its intended purpose and not diverted to other projects or operations.

Ongoing Reviews

Bulgarian authorities will conduct annual reviews of the profits generated from the infrastructure, starting from the project's completion and continuing for a minimum of twenty years. Each year, the aid beneficiary is required to submit a detailed financial statement that includes the balance of costs and profits derived from the infrastructure operations. This ongoing review ensures that the financial aid is being utilized effectively and that any excess profits are identified and addressed.

Availability of Supporting Documents

The beneficiary must ensure that the originals of the supporting documents are available to control bodies for at least five years from the project's completion, unless a longer period is specified in the award decision. This measure ensures that all financial transactions can be audited and verified if necessary.

Review of Grant Conditions

The body responsible for monitoring the aid will periodically review the conditions for granting the aid based on the data reported by the beneficiary. If it is found that the forecasted revenue or expenditure results in overcompensation, the beneficiary must either repay the excess amount or reinvest the additional profits into further network expansions under the same conditions as the original aid.

Annual Balance Submission

The beneficiary must submit its annual balance of revenue and expenditure derived from the subsidized infrastructure. This submission allows for annual verification of any potential overcompensation. This verification process will be carried out for 20 years from the project's completion.

Project Business Plan

As part of the tender process, applicants must submit a comprehensive project business plan. This business plan is crucial for the annual verification of overcompensation and must include the following elements:

- Operational Costs and Investments: The plan should detail all operational costs and investments related to the implementation, deployment, and maintenance of the project.
- Expected Benefits: It must outline the expected benefits over the lifetime of the subsidized infrastructure, which is set at 20 years. This long-term perspective ensures that the project remains viable and sustainable.
- Aid Intensity: The plan should specify the aid intensity required, as determined by the aid applicant on an ex ante basis, to cover the planned funding gap. This ensures that the financial aid is appropriately scaled to the needs of the project.

This comprehensive approach not only fosters prudent financial management but also enhances the overall integrity and success of the financial aid program.

Appendix 1: WACC Calculation

Appendix 1 WACC Calculation.xlsx