

Vertical Tax Sharing

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"In space, no one can hear you think."

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1 Vertical Tax Sharing

1.1 Introduction to Vertical Tax Sharing

Vertical tax sharing represents one of the most fundamental yet complex mechanisms in modern fiscal systems, serving as the circulatory system of public finance across multi-tiered governmental structures. At its core, vertical tax sharing encompasses the distribution of tax revenues between different levels of government—typically national, state or provincial, and local authorities—creating a fiscal relationship that determines how public resources flow through the administrative hierarchy. This intricate system stands in contrast to horizontal tax sharing, which involves revenue redistribution between governments at the same level, such as transfers between states or between municipalities. The conceptual framework of vertical tax sharing incorporates several key components: tax assignment, which determines which level of government has the authority to levy specific taxes; revenue sharing, which establishes formulas for distributing collected revenues; fiscal transfers, which involve the movement of funds between governmental levels; and the broader field of intergovernmental fiscal relations that governs these arrangements. The complexity of these relationships becomes apparent when considering that most countries employ multiple tax sharing mechanisms simultaneously, creating a fiscal architecture that must balance efficiency, equity, and accountability while adapting to changing economic and political landscapes.

The significance of vertical tax sharing extends far beyond mere accounting procedures; it stands as a cornerstone of fiscal federalism and the foundation of effective multi-level governance. In federal systems like the United States, Germany, or Canada, vertical tax sharing mechanisms determine the delicate balance between centralized control and local autonomy, shaping how public services are financed and delivered across vast territories with diverse populations and needs. These arrangements play a crucial role in addressing vertical fiscal imbalances—the mismatch between expenditure responsibilities and revenue-raising capacities at different government levels—that commonly emerge in multi-tiered systems. For instance, local governments often bear responsibility for essential services like education, public safety, and infrastructure maintenance, yet may lack sufficient tax bases to fund these adequately. Vertical tax sharing mechanisms bridge this gap through various transfer arrangements, ensuring that citizens receive reasonably consistent levels of public services regardless of where they reside. The German system of fiscal equalization, or *Länderfinanzausgleich*, exemplifies how sophisticated vertical tax sharing can maintain both unity and diversity within a federal structure, allowing wealthier states to support less prosperous ones while preserving significant regional autonomy in policy implementation. This balancing act becomes particularly evident during times of economic crisis, as witnessed during the 2008 global financial crisis when many countries relied on vertical tax sharing adjustments to stabilize subnational finances and maintain essential public services.

Across the globe, vertical tax sharing arrangements exhibit remarkable diversity, reflecting different historical trajectories, political philosophies, and economic realities. According to the Organisation for Economic Co-operation and Development (OECD), approximately 60% of total government revenues in federal countries are collected by central governments and subsequently shared with subnational entities, though this figure varies dramatically from one nation to another. At one end of the spectrum, highly centralized countries

like France and the United Kingdom maintain relatively limited vertical tax sharing, with central governments collecting approximately 90-95% of total tax revenues before allocating portions to local authorities through grants and transfers. In contrast, more decentralized systems such as Switzerland and Canada exhibit greater revenue autonomy at subnational levels, with provincial and cantonal governments collecting 40-50% of total tax revenues while still participating in various sharing arrangements with the central government. The United States presents a particularly complex case, where federal grants to states and localities exceeded \$750 billion in 2020, representing approximately 3.5% of GDP and supporting everything from highways to healthcare programs. Meanwhile, developing countries face unique challenges in implementing effective vertical tax sharing systems, as seen in India's Goods and Services Tax (GST) Council, which represents a groundbreaking attempt to harmonize tax administration across the world's largest democracy while addressing profound regional economic disparities. The global landscape of vertical tax sharing thus reveals a continuum of approaches, each tailored to specific national contexts but all grappling with similar fundamental challenges of resource allocation and governance coordination.

This comprehensive exploration of vertical tax sharing will progress through several interconnected sections, each building upon the foundational concepts introduced here to develop a nuanced understanding of this critical fiscal mechanism. The journey begins in Section 2 with an examination of the historical development of vertical tax sharing, tracing its evolution from ancient tribute systems in civilizations like Rome and China through the sophisticated mechanisms of modern nation-states. This historical perspective illuminates how fiscal arrangements have adapted to changing political structures, economic systems, and administrative capabilities over millennia. Section 3 then delves into the theoretical foundations that underpin contemporary vertical tax systems, drawing from public finance theory, fiscal federalism, principal-agent relationships, and optimal tax assignment to establish analytical frameworks for evaluating different approaches. The theoretical discussion gives way to practical comparative analysis in Section 4, which examines distinct models of vertical tax sharing implemented around the world—from highly centralized systems in France and Sweden to decentralized approaches in Switzerland and Canada, with particular attention to the hybrid models that characterize many large federal states. Section 5 explores the legal and constitutional frameworks that structure these fiscal relationships, revealing how formal institutions shape and constrain the practice of vertical tax sharing. Throughout these sections, several key themes emerge and recur: the perennial tension between efficiency and equity in revenue distribution, the challenge of maintaining accountability across multiple governmental levels, and the imperative of adaptability in the face of economic, political, and social change. As we progress through this exploration, the intricate mechanisms of vertical tax sharing will be revealed not as dry technical procedures but as dynamic systems that reflect fundamental choices about how societies organize themselves, distribute resources, and balance competing values of unity and diversity in governance.

1.2 Historical Development of Vertical Tax Sharing

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taining the same authoritative yet engaging style with rich detail and flowing narrative prose.

The section should cover: 2.1 Early Fiscal Arrangements in Ancient Civilizations 2.2 Emergence in Early Modern States 2.3 19th and Early 20th Century Developments 2.4 Post-WWII Evolution and Modern Systems

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The historical evolution of vertical tax sharing reveals a fascinating journey through human civilization's attempts to balance central authority with local autonomy in fiscal matters. From the earliest complex societies to modern nation-states, the distribution of tax revenues has reflected fundamental choices about governance, power, and resource allocation. Examining this historical trajectory illuminates not only how fiscal arrangements have adapted to changing political and economic contexts but also how they have shaped the very structure of states and empires throughout human history. The development of vertical tax sharing mechanisms demonstrates humanity's enduring struggle to reconcile the efficiency of centralized revenue collection with the accountability and responsiveness of local governance—a tension that continues to define contemporary fiscal federalism.

Early fiscal arrangements in ancient civilizations reveal surprisingly sophisticated approaches to revenue distribution between central and local authorities. The Roman Empire, for instance, developed an intricate system where tax collection responsibilities were shared between imperial officials and local publicani, private tax farmers who bid for the right to collect taxes in specific regions. This arrangement created an early form of vertical tax sharing, with the central government establishing tax rates and overall policy while local entities handled collection and retained a portion as compensation. The Roman system of tributum and vectigal—direct and indirect taxes respectively—flowed between the imperial treasury and municipal coffers, financing both imperial ambitions and local infrastructure projects like roads, aqueducts, and public buildings. Similarly, Han Dynasty China (206 BCE-220 CE) implemented a sophisticated fiscal structure where the central government collected land taxes and poll taxes while local authorities managed commercial levies and market fees. The Chinese system featured regular transfers to the imperial capital alongside retained revenues for provincial administration, creating a balanced fiscal relationship that helped maintain stability across vast territories. The Persian Empire under Darius I (522-486 BCE) established perhaps the most advanced early system, dividing the empire into satrapies with fixed tribute obligations that allowed local governors considerable autonomy in collection methods while ensuring predictable revenue flows to the central treasury. These ancient arrangements, though lacking modern theoretical foundations, demonstrated practical recognition of the principles that would later formalize vertical tax sharing: the need for central oversight combined with local implementation flexibility, and the importance of balancing revenue extraction with local governance capacity.

The emergence of early modern states witnessed significant evolution in vertical tax sharing mechanisms as European monarchs grappled with the challenges of centralizing power while accommodating traditional local privileges and administrative realities. Medieval feudal systems had featured highly personalized fiscal relationships between lords and vassals, but the rise of absolute monarchies in the 16th and 17th centuries necessitated more systematic approaches to revenue distribution. France under Louis XIV developed a complex system where royal tax farmers collected indirect taxes while provincial estates (*états provinciaux*) managed direct taxation in certain regions, creating a patchwork of vertical fiscal relationships that reflected the kingdom's gradual process of centralization. The British Empire evolved differently, with the Glorious Revolution of 1688 establishing parliamentary control over taxation that gradually led to more standardized systems of local taxation and central-local revenue sharing. Notably, the Poor Law of 1601 created a framework for local property taxation to fund relief for the poor, establishing an early principle of local revenue responsibility for locally administered services—a concept that would later inform modern vertical tax sharing theory. The Dutch Republic presented an innovative model during its Golden Age (17th century), where the confederal structure allowed significant fiscal autonomy to provinces while maintaining certain centrally collected revenues for common defense and administration. This system demonstrated how vertical tax sharing could function effectively even in relatively loose political unions, with each province retaining substantial control over its fiscal affairs while contributing to shared imperial objectives. The early modern period also witnessed the emergence of theoretical foundations for fiscal federalism, with thinkers like Charles de Montesquieu advocating for the separation of powers and balanced fiscal relationships between central and regional authorities, planting intellectual seeds that would later blossom into more systematic approaches to vertical tax sharing.

The 19th and early 20th centuries witnessed profound transformations in vertical tax sharing systems as industrialization, democratization, and the growth of modern administrative states reshaped fiscal relationships. The United States provides a compelling case study during this period, particularly through the evolution of its fiscal federalism from the early republic through the Civil War and Progressive Era. The American system initially featured relatively limited vertical tax sharing, with customs duties providing the bulk of federal revenue while states relied on property taxes. However, the Civil War marked a turning point, as the federal government established new revenue sources including the first income tax, creating the foundation for future intergovernmental fiscal transfers. The ratification of the 16th Amendment in 1913, authorizing federal income taxation without apportionment among states, further strengthened the fiscal capacity of the central government and enabled more sophisticated vertical tax sharing arrangements. Across Europe, the unification of Germany in 1871 under Bismarck created a federal state with complex fiscal relationships between the imperial government and individual states. The German system featured shared tax revenues from certain sources alongside exclusive state and imperial taxes, establishing principles of fiscal equalization that would evolve into the modern *Länderfinanzausgleich* system. The British Reform Acts of the 19th century, which gradually expanded suffrage, led to increased demands for local services and corresponding developments in intergovernmental fiscal transfers, particularly as the central government began providing grants to local authorities for education and public health. Meanwhile, in the late 19th century, Australia and Canada established federal systems influenced by both British and American models but adapted to their unique

circumstances, developing vertical tax sharing mechanisms that balanced regional autonomy with national unity. The early 20th century brought new challenges as the Great Depression demonstrated the limitations of purely subnational fiscal capacity, leading to increased vertical fiscal transfers in many countries as central governments assumed greater responsibility for economic stabilization and social welfare.

The post-World War II era witnessed unprecedented transformation and sophistication in vertical tax sharing systems globally, driven by the rise of the welfare state, decolonization, and new economic theories of public finance. The Bretton Woods institutions and Marshall Plan influenced fiscal arrangements across Western Europe, promoting centralization of certain revenue functions while establishing transfer mechanisms to rebuild war-torn economies. Germany's postwar constitution, the Basic Law of 1949, created a sophisticated system of fiscal federalism with specific provisions for tax sharing between the federal government, states (Länder), and municipalities, including both automatic revenue sharing and discretionary grants. This system has continued to evolve through subsequent reforms, demonstrating how vertical tax sharing arrangements can adapt to changing economic and political circumstances while maintaining fundamental principles. The United States experienced dramatic growth in federal grant programs to states and localities during the 1960s and 1970s, particularly under the Johnson administration's Great Society initiatives, which expanded federal involvement in areas traditionally managed at subnational levels like education, healthcare, and urban development. This period saw the development of more complex grant formulas and mechanisms designed to achieve specific policy objectives while respecting state and local autonomy. Decolonization presented unique challenges as newly independent nations in Africa and Asia had to establish vertical tax sharing systems suitable to their circumstances. India's constitutional framework, established in 1950, created a complex fiscal federalism system with a detailed division of taxing powers between central and state governments, complemented by constitutionally established institutions like the Finance Commission to recommend revenue sharing formulas. Nigeria's federal system has evolved through multiple constitutional arrangements since independence in 1960, reflecting the country's ethnic diversity and regional disparities through various approaches to revenue distribution, particularly regarding natural resource revenues. By the late 20th century, vertical tax sharing had become increasingly sophisticated, with many countries developing complex formulas based on objective criteria like population, economic capacity, and fiscal need rather than purely political considerations. The fall of the Soviet Union and subsequent transition to market economies required many Eastern European countries to completely redesign their intergovernmental fiscal systems, often with guidance from international organizations like the International Monetary Fund and World Bank. This period also witnessed the emergence of the European Union as a novel form of multi-level governance with its own distinctive vertical fiscal arrangements, including structural funds designed to reduce regional disparities across member states. The evolution of vertical tax sharing into the 21st century continues to reflect changing societal priorities, economic conditions, and governance philosophies, demonstrating its enduring importance as a mechanism for balancing unity and diversity in multi-level political systems.

This historical journey from ancient tribute systems to modern fiscal federalism reveals both the remarkable adaptability of vertical tax sharing arrangements and their enduring significance in governance structures. The evolution of these mechanisms demonstrates how societies have continually sought to balance competing

values of centralization and decentralization, efficiency and equity, uniformity and diversity. As we turn to the theoretical foundations of vertical tax sharing in the following section, this historical perspective provides essential context for understanding how contemporary approaches have been shaped by centuries of practical experience and experimentation.

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2.1 Early Fiscal Arrangements in Ancient Civilizations - Covered Roman, Han Dynasty Chinese, and Persian systems
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1.3 Theoretical Foundations

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The historical evolution of vertical tax sharing arrangements, while fascinating in its own right, naturally leads us to examine the theoretical frameworks that have been developed to understand, evaluate, and improve these complex fiscal systems. Moving beyond empirical observation to theoretical analysis allows us to identify fundamental principles that underpin effective vertical tax sharing arrangements and provides tools for assessing their performance across diverse contexts. The theoretical foundations of vertical tax sharing draw from multiple disciplines including economics, political science, and public administration, creating a rich intellectual tapestry that helps explain both the persistence of certain arrangements and the failure of others. These theoretical perspectives not only enhance our understanding of existing systems but also provide guidance for policymakers grappling with the design and reform of intergovernmental fiscal relations in an increasingly complex global environment.

Public finance theory provides the essential bedrock upon which our understanding of vertical tax sharing is built, offering fundamental principles about efficient taxation and optimal revenue allocation across different government levels. The core challenge addressed by public finance theory in the context of vertical

tax sharing revolves around achieving efficiency in revenue collection and allocation while maintaining equity across jurisdictions and accountability to citizens. The theory of fiscal imbalance, which emerges from public finance analysis, identifies the mismatch between expenditure responsibilities and revenue-raising capacities at different government levels as a central problem that vertical tax sharing mechanisms must address. Richard Musgrave's seminal work on public finance established that different government functions may be most efficiently performed at different levels, creating a natural theoretical foundation for vertical tax sharing arrangements that support these functional divisions. The benefit principle, which suggests that those who benefit from public services should contribute to their financing, and the ability-to-pay principle, which posits that tax burdens should be distributed according to taxpayers' capacity to bear them, both play crucial roles in shaping vertical tax sharing designs. For instance, the benefit principle might suggest that local governments should finance services like local roads and parks through local taxes, while the ability-to-pay principle might support central government collection and redistribution of progressive income taxes to ensure greater equity across regions. James Buchanan's work on fiscal federalism further developed these ideas by examining how different tax and expenditure assignments might affect the behavior of both governments and citizens, highlighting the importance of aligning revenue-raising authority with expenditure responsibility to create accountability. Real-world applications of these principles can be observed in countries like Denmark, where the central government collects progressive income taxes and redistributes portions to municipalities based on objective criteria reflecting both need and capacity, embodying the ability-to-pay principle while maintaining local service delivery efficiency.

Building upon these public finance foundations, fiscal federalism theory offers more specific insights into how vertical tax sharing arrangements can be designed to support effective multi-level governance. Wallace Oates' decentralization theorem, a cornerstone of fiscal federalism theory, posits that for public services whose benefits are largely confined to particular jurisdictions, the level of government closest to the citizens will typically make more efficient decisions about provision and financing. This theorem provides a theoretical justification for assigning certain revenue sources and expenditure responsibilities to subnational governments while acknowledging the continued role of central authorities in broader tax collection and redistribution. Charles Tiebout's influential model of "voting with feet" adds another dimension to this analysis, suggesting that competition between jurisdictions for mobile taxpayers can create efficiency incentives in local service provision, but only if subnational governments have meaningful fiscal autonomy—including control over at least some revenue sources. The tension between these theoretical insights creates a fundamental design challenge for vertical tax sharing systems: how to balance the efficiency benefits of local fiscal autonomy with the equity advantages of central revenue collection and redistribution. This challenge is vividly illustrated in the United States, where state and local governments possess significant fiscal autonomy but also exhibit substantial disparities in revenue-raising capacity, prompting ongoing debates about the appropriate level of central government involvement in fiscal equalization. Musgrave's three-function framework—distinguishing between allocation, distribution, and stabilization functions of government—provides additional theoretical guidance for vertical tax sharing design. This framework suggests that while stabilization functions (like macroeconomic management) are best performed by central governments, allocation functions (like service delivery) may benefit from decentralization, and distribution functions (like

reducing inequality) require coordination across government levels. Germany's fiscal equalization system exemplifies this theoretical approach, with the federal government handling macroeconomic stabilization while states and municipalities provide most public services, supported by sophisticated equalization transfers that address distributional concerns.

The relationship between central and subnational governments in vertical tax sharing arrangements can be fruitfully analyzed through the lens of principal-agent theory, which highlights challenges of information asymmetry, monitoring difficulties, and potential incentive misalignments. In this framework, the central government typically acts as the principal, seeking to achieve certain policy objectives through subnational governments that serve as agents implementing policies and delivering services. However, subnational governments often possess superior information about local conditions, needs, and preferences—an information asymmetry that creates both opportunities and challenges for effective vertical tax sharing design. Jean-Jacques Laffont and Jean Tirole's work on regulation and incentives in multi-level governance demonstrates how information asymmetries can lead to problems of moral hazard (where subnational governments take excessive risks expecting central bailouts) and adverse selection (where central governments cannot accurately distinguish between genuinely needy jurisdictions and those merely presenting themselves as such). These theoretical insights help explain the prevalence of conditional grants in many vertical tax sharing systems, as these instruments attempt to mitigate information problems by specifying how transferred funds must be used while still allowing some local discretion. The Australian system of specific purpose payments to states exemplifies this approach, providing federal funding for designated policy areas like health and education while allowing states considerable flexibility in implementation details. Principal-agent theory also highlights the importance of monitoring mechanisms and performance indicators in vertical tax sharing arrangements, as these tools can help overcome information asymmetries and improve accountability. Brazil's experience with fiscal responsibility laws since the late 1990s illustrates how formal rules and transparency requirements can address principal-agent problems by providing clearer information about subnational fiscal performance to both central authorities and citizens. The theoretical perspective also suggests that vertical tax sharing arrangements should be designed with appropriate incentives in mind, ensuring that subnational governments face the consequences of their fiscal decisions to varying degrees rather than having complete soft budget constraints that might encourage irresponsible behavior.

Optimal tax assignment theory provides the final crucial piece of the theoretical foundation for vertical tax sharing, offering principles for determining which taxes should be assigned to which levels of government to achieve the most efficient and equitable outcomes. This theory, developed by scholars like Richard Bird, Teresa Ter-Minassian, and Anwar Shah, establishes criteria for tax assignment that include efficiency (minimizing economic distortions), equity (ensuring fair distribution of tax burdens), administrative feasibility (considering collection capacity), and accountability (linking tax decisions to expenditure choices). A fundamental principle emerging from this theory is that mobile tax bases should generally be assigned to higher levels of government to prevent destructive tax competition between jurisdictions, while immobile bases can be more appropriately assigned to lower levels where local accountability can be maintained. This explains why most countries assign personal and corporate income taxes to central governments while allowing subnational authorities to levy property taxes, which are based on immobile assets. The theory also highlights

the importance of tax-exporting—where jurisdictions impose taxes that fall partially on non-residents—as a factor that can distort optimal assignment decisions. For instance, tourism-dependent localities might be tempted to impose hotel taxes that primarily burden visitors rather than residents, potentially leading to excessive taxation of this sector. Canada’s tax collection agreements provide an interesting application of optimal tax assignment principles, with the federal government collecting personal income taxes on behalf of most provinces using a common tax base but allowing provinces to set their own rates, achieving administrative efficiency while preserving meaningful subnational tax autonomy. The theory also recognizes that some taxes may be appropriately shared between levels of government, with specific portions automatically flowing to different authorities based on predetermined formulas. Germany’s value-added tax sharing arrangement, where a fixed percentage of VAT revenues automatically flows to state governments, exemplifies this approach, combining the administrative efficiency of central collection with the revenue certainty that subnational governments require for planning purposes. Optimal tax assignment theory also emphasizes that the best arrangements depend on country-specific circumstances, including size, development level, administrative capacity, and political institutions—explaining why successful vertical tax sharing systems vary so dramatically across different national contexts.

These theoretical foundations—drawn from public finance, fiscal federalism, principal-agent analysis, and optimal tax assignment—collectively provide a robust intellectual framework for understanding and evaluating vertical tax sharing arrangements. They offer not only descriptive insights into why existing systems function as they do but also normative guidance for designing improved arrangements that can better balance competing objectives of efficiency, equity, accountability, and adaptability. As we turn to examine specific models of vertical tax sharing implemented around the world in the following section, these theoretical perspectives will provide valuable analytical tools for understanding the logic behind different approaches and assessing their relative strengths and weaknesses in diverse contexts.

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3.1 Public Finance Theory Principles - Covered efficiency, fiscal imbalance, benefit principle, ability-to-pay principle, and Musgrave’s work

1.4 Models of Vertical Tax Sharing Around the World

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I should cover the following subsections: 4.1 Centralized Models 4.2 Decentralized Models 4.3 Hybrid Models 4.4 Developing Country Experiences

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The theoretical frameworks we have explored provide essential analytical tools, but the true complexity and diversity of vertical tax sharing arrangements become most apparent when examining specific models implemented across different countries and contexts. These real-world systems reveal both the practical application of theoretical principles and the adaptations required to accommodate unique historical, political, and economic circumstances. By examining a spectrum of approaches—from highly centralized models that concentrate fiscal authority at the national level to decentralized systems that grant significant subnational autonomy, and the hybrid approaches that fall between these extremes—we gain valuable insights into the strengths and limitations of different designs. This comparative analysis also illuminates how vertical tax sharing arrangements continue to evolve in response to changing governance challenges, economic conditions, and societal expectations, demonstrating the dynamic nature of intergovernmental fiscal relations in an increasingly complex global landscape.

Centralized models of vertical tax sharing concentrate fiscal authority primarily at the national level, with subnational governments relying heavily on transfers and grants from the central treasury rather than possessing significant autonomous revenue sources. These systems typically emerge in countries with strong traditions of national unity, relatively small geographic size, or historical experiences that have created a preference for centralized control over public finances. France exemplifies this centralized approach, where the central government collects approximately 90% of total tax revenues before allocating portions to regions, departments, and communes through various grants and transfers. The French system operates through several mechanisms, including the Dotation Globale de Fonctionnement (DGF), which provides general operating support to local governments based on complex formulas considering population, previous revenues, and specific local characteristics, and the Dotation Globale d'Équipement (DGE), which funds capital investments. This highly centralized model reflects France's historical tradition of strong central authority dating back to the absolute monarchy and reinforced during the Napoleonic era, which created administrative uniformity across the national territory. The United Kingdom presents another case of centralized vertical tax sharing, particularly evident in England where local governments rely heavily on central government grants and council tax—a relatively limited property tax that generates only about 25% of local revenue. The UK system has evolved through several reforms, including the introduction of formula-based grants like the Revenue Support Grant and more recent mechanisms such as the Business Rates Retention Scheme, which allows local authorities to retain a portion of business rates growth. However, even with these reforms, the system remains fundamentally centralized, with the central government exercising considerable control over local finances through both grants and regulatory frameworks. Scandinavian countries like Sweden also employ relatively centralized vertical tax sharing models, with the central government collecting the bulk of revenues before redistributing to municipalities and county councils. The Swedish system features equalization mechanisms designed to ensure that all local jurisdictions can provide reasonably comparable services

at similar tax rates, reflecting the strong egalitarian traditions of Nordic welfare states. These centralized models offer certain advantages, including administrative efficiency, greater capacity for macroeconomic stabilization, and the ability to address regional inequalities through redistribution. However, they also face challenges related to local accountability, as the disconnect between revenue collection and expenditure decisions can weaken the link between citizens' preferences and local government actions. Furthermore, centralized models may struggle to accommodate diverse local preferences and circumstances, potentially leading to inefficient one-size-fits-all approaches to service provision.

At the opposite end of the spectrum, decentralized models of vertical tax sharing grant subnational governments substantial autonomy over tax policy and revenue collection, with limited reliance on central transfers. These systems typically emerge in countries with strong federal traditions, significant regional diversity, or historical experiences that have created powerful subnational political entities. Switzerland represents perhaps the most extreme example of fiscal decentralization, with cantonal and municipal governments collecting approximately 60% of total tax revenues and possessing broad authority to set tax rates and bases within constitutional limits. The Swiss system reflects the country's historical development as a confederation of essentially sovereign cantons that gradually ceded specific powers to the federal government while retaining significant fiscal autonomy. This decentralized model has produced remarkable fiscal competition between cantons, with tax rates varying dramatically across jurisdictions—personal income tax rates can range from approximately 10% to 40% depending on the canton and municipality. This competition has been credited with encouraging fiscal discipline and innovation in public service delivery, though it has also raised concerns about potential underprovision of certain public goods and increased economic inequality between jurisdictions. Canada presents another case of relatively decentralized vertical tax sharing, particularly evident in the relationship between the federal government and provinces. Canadian provinces possess significant taxation powers, including authority over personal and corporate income taxes, consumption taxes, and natural resource revenues. The federal-provincial tax collection agreements, which allow the federal government to collect provincial income taxes using a common definition but province-specific rates, represent an innovative compromise between administrative efficiency and provincial autonomy. Natural resource revenues further distinguish the Canadian model, with provinces like Alberta and Saskatchewan retaining virtually all revenues from oil and gas extraction, creating substantial fiscal disparities between resource-rich and resource-poor provinces. The United States also exemplifies a decentralized approach, with state and local governments collecting approximately 40% of total tax revenues through their own tax systems, including sales taxes, property taxes, and state income taxes. The American model features limited mandated vertical tax sharing, with federal grants to states and localities typically serving specific policy purposes rather than general revenue support. Decentralized models offer several potential advantages, including better alignment between local preferences and service provision, stronger accountability as citizens can more directly observe the relationship between taxes paid and services received, and the potential for policy innovation through interjurisdictional competition. However, these models also face challenges related to coordination difficulties, potential inefficiencies from tax competition, and disparities in fiscal capacity between jurisdictions that may lead to inequalities in public service provision.

Between the extremes of centralization and decentralization, hybrid models of vertical tax sharing attempt

to balance the advantages of both approaches through sophisticated institutional arrangements that combine elements of revenue autonomy with redistribution mechanisms. These systems typically emerge in large federal countries that seek to accommodate regional diversity while maintaining national unity and addressing fiscal disparities. Germany's fiscal equalization system, or *Länderfinanzausgleich*, represents one of the most sophisticated hybrid models, combining shared tax revenues, supplementary grants, and horizontal equalization payments between states. The German system features several distinctive elements: shared revenues from major taxes including income tax, corporate tax, and value-added tax, with specific portions automatically allocated to federal, state, and municipal governments; a complex equalization mechanism that redistributes revenues from fiscally stronger to weaker states; and supplementary federal grants to address specific needs or temporary challenges. This arrangement reflects Germany's historical experience with regional disparities and constitutional commitment to establishing "uniform living conditions" across the national territory while preserving significant state autonomy. Australia presents another compelling hybrid model, combining a relatively centralized revenue collection system with substantial vertical fiscal transfers to states through the Commonwealth Grants Commission. The Australian system employs a sophisticated horizontal fiscal equalization mechanism that aims to ensure each state can provide services at a standard level if it makes a similar effort in taxation. This approach has allowed Australia to maintain significant service uniformity across a vast continent with dispersed population centers while accommodating some regional differences in policy approaches. Spain's model of vertical tax sharing, established following the transition to democracy in the late 1970s, represents another interesting hybrid approach designed to accommodate the country's complex territorial structure with multiple "autonomous communities" possessing varying degrees of fiscal authority. The Spanish system features different financing arrangements for different communities, with "foral" communities like the Basque Country and Navarre possessing nearly complete fiscal autonomy while other communities participate in shared tax systems and receive equalization transfers. This diversity within a single national framework reflects Spain's historical tensions between centralism and regional particularism, creating a flexible system that can accommodate varying regional preferences for autonomy. Hybrid models offer the potential to combine the efficiency advantages of centralized revenue collection with the accountability benefits of subnational expenditure responsibility while addressing fiscal disparities through equalization mechanisms. However, these systems often face challenges related to complexity, as the intricate arrangements can be difficult for citizens to understand and may create opportunities for strategic behavior by governments seeking to maximize their fiscal advantages.

Developing countries face unique challenges in implementing effective vertical tax sharing systems, often grappling with limited administrative capacity, large informal sectors, significant regional disparities, and political instability that complicate fiscal arrangements. India's Goods and Services Tax (GST) system, implemented in 2017, represents a groundbreaking attempt to harmonize indirect taxation across the world's largest democracy while establishing a new vertical tax sharing mechanism between the central government and states. The Indian GST Council, composed of representatives from both central and state governments, makes decisions by consensus on tax rates, exemptions, and administrative procedures, creating an innovative institutional framework for cooperative federalism in taxation. The system features a dual GST structure with both central (CGST) and state (SGST) components, along with an integrated IGST for inter-state

transactions, with specific portions automatically shared between levels of government. This arrangement attempts to balance the need for a common market across India's diverse states with respect for state fiscal autonomy, though it has faced challenges during implementation and requires ongoing adjustment. Brazil's vertical tax sharing system, established in its 1988 constitution following democratization, features complex arrangements for distributing revenues from various taxes among federal,

1.5 Legal and Constitutional Frameworks

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The diverse models of vertical tax sharing we have examined across different countries and contexts do not emerge in a vacuum but are structured and constrained by formal legal and constitutional frameworks that establish the rules of intergovernmental fiscal relations. These institutional arrangements determine which levels of government possess taxation authority, how revenues are to be shared, and the mechanisms through which fiscal disputes are resolved. The legal foundations of vertical tax sharing represent a critical intersection of constitutional law, fiscal policy, and political power, reflecting fundamental choices about the distribution of authority within a political system. By examining how different countries have embedded vertical tax sharing arrangements in their constitutional and legislative frameworks, we gain deeper insight into how formal institutions shape fiscal outcomes and how these arrangements evolve over time through legal interpretation and political negotiation.

Constitutional provisions represent the most fundamental legal foundation for vertical tax sharing arrangements in many countries, establishing the basic structure of fiscal relations between different levels of government and often serving as a constraint on legislative changes to these arrangements. The United States Constitution provides a relatively brief but foundational framework for American fiscal federalism, with Article I, Section 8 granting Congress the power to "lay and collect taxes, duties, imposts and excises" while the Tenth Amendment reserves powers not delegated to the federal government to the states. This constitutional framework has been interpreted through numerous Supreme Court decisions that have shaped the boundaries of federal and state taxing authority, including landmark cases like *McCulloch v. Maryland* (1819), which established that states cannot tax federal institutions, and *South Dakota v. Wayfair* (2018),

which expanded state authority to tax remote sales. The relatively limited explicit constitutional treatment of fiscal relations in the United States has allowed considerable flexibility in the evolution of vertical tax sharing arrangements through legislation and political negotiation, contributing to the dynamic nature of American fiscal federalism. In contrast, Germany's Basic Law (Grundgesetz) contains extensive and detailed provisions governing fiscal relations between the federal government, states (Länder), and municipalities, reflecting the country's experience with historical instability and commitment to establishing clear rules for intergovernmental cooperation. Articles 104a through 115 of the Basic Law establish a comprehensive framework for tax assignment, revenue sharing, and fiscal equalization, including specific formulas for distributing certain tax revenues and principles for addressing fiscal disparities. These constitutional provisions have been further elaborated through numerous Federal Constitutional Court decisions that have interpreted and refined the requirements for fiscal equalization, most notably in the 1952, 1986, and 1992 decisions that established the principle that fiscal equalization must achieve "approximate equality of living conditions" across different regions. Canada's constitutional approach to vertical tax sharing, established in the Constitution Act of 1867 and subsequent amendments, reflects the country's origins as a confederation of relatively autonomous provinces. Section 91 grants the federal government authority over "the raising of Money by any Mode or System of Taxation" while Section 92 gives provinces authority over "Direct Taxation within the Province in order to the raising of a Revenue for Provincial Purposes," creating overlapping jurisdictions that have required ongoing negotiation and clarification through judicial interpretation. The Canadian approach demonstrates how constitutional ambiguity can sometimes facilitate flexibility and adaptation in vertical tax sharing arrangements, as the federal and provincial governments have developed various cooperative mechanisms, including tax collection agreements and equalization payments, without explicit constitutional authorization for these arrangements. Brazil's 1988 Constitution, drafted following the country's return to democracy, contains particularly detailed provisions regarding vertical tax sharing, reflecting the desire to establish clear rules after a period of centralized military rule. The Brazilian Constitution specifies exact percentages of various tax revenues that must be transferred from federal to state and municipal governments, as well as from states to municipalities, creating a highly prescriptive framework that limits legislative discretion but provides certainty to subnational governments. These examples illustrate how constitutional provisions can range from sparse and flexible to detailed and prescriptive, with different approaches reflecting each country's historical experiences, political traditions, and governance values.

Beyond constitutional foundations, legislative frameworks provide the operational details and mechanisms through which vertical tax sharing arrangements function in practice. These legislative enactments translate broad constitutional principles into specific formulas, procedures, and institutions that shape the day-to-day operation of intergovernmental fiscal relations. Australia's Commonwealth Legislation provides a compelling example of how detailed statutory frameworks can structure vertical tax sharing arrangements. The Financial Agreement of 1927, incorporated into the Financial Agreement Act 1994, established the Loan Council to coordinate borrowing by different levels of government and created mechanisms for federal financial assistance to states. Subsequent legislation has refined these arrangements, with the Federal Financial Relations Act 2009 establishing the current system of federal payments to states through both specific purpose payments and general revenue assistance. The Australian framework also includes the Commonwealth

Grants Commission, established by legislation in 1933, which develops recommendations for the distribution of general revenue assistance among states based on the principle of horizontal fiscal equalization. This institutional architecture demonstrates how legislative frameworks can create both specific distribution mechanisms and ongoing processes for reviewing and adjusting these arrangements as circumstances change. India's legislative approach to vertical tax sharing has evolved significantly over time, particularly with the implementation of the Goods and Services Tax (GST) regime. The Constitution (One Hundred and First Amendment) Act, 2016, created the constitutional foundation for GST, while the Central Goods and Services Tax Act, 2017, and various state GST acts established the detailed legislative framework. These acts created the GST Council, a unique federal institution composed of representatives from both central and state governments, with responsibility for making decisions about GST rates, exemptions, and administrative procedures by consensus. The legislative framework also specifies the sharing of GST revenues between central and state governments, with a formula that gradually increases the state share over time to compensate for the loss of state taxing authority under the new system. This approach demonstrates how legislative frameworks can adapt to changing economic circumstances while attempting to balance competing interests between different levels of government. South Africa's legislative framework for vertical tax sharing, established following the transition to democracy in 1994, reflects the country's commitment to addressing historical inequalities while establishing cooperative governance. The Intergovernmental Fiscal Relations Act, 1997, created the institutional framework for vertical tax sharing, establishing the Budget Council, the Financial and Fiscal Commission, and procedures for determining the equitable division of nationally raised revenue. This legislation, together with the Division of Revenue Act, which is passed annually, specifies how revenues are to be divided among national, provincial, and local governments based on objective criteria and recommendations from advisory bodies. The South African approach illustrates how legislative frameworks can incorporate both technical expertise through advisory commissions and political negotiation through intergovernmental forums to create legitimate and effective vertical tax sharing arrangements. The European Union presents a unique case of legislative frameworks for vertical fiscal relations operating across sovereign states. The EU's own resources system, governed by the Treaty on the Functioning of the European Union and implementing decisions, determines how member states contribute to the EU budget and how these resources are distributed through various programs and funds. The EU framework includes complex rules for horizontal redistribution between member states, with net contributors and recipients determined by factors including economic prosperity and structural needs. Additionally, the EU's cohesion policy, implemented through regulations like the Common Provisions Regulation, establishes detailed rules for structural funds designed to reduce regional disparities across the Union. This transnational legislative framework demonstrates how vertical tax sharing principles can be adapted to operate across traditional national boundaries, creating a distinctive model of multi-level fiscal governance.

The legal and constitutional frameworks that structure vertical tax sharing arrangements are not static but evolve over time through constitutional amendments, legislative reforms, and judicial interpretations that respond to changing economic conditions, political pressures, and governance challenges. This dynamic evolution can be observed in countries like Brazil, where frequent constitutional amendments have modified vertical tax sharing arrangements to address fiscal crises or respond to political demands. Similarly, Germany

has periodically reformed its fiscal equalization system through legislation and constitutional amendments, most recently in 2017 with the Federalism Reform II, which adjusted the mechanisms for fiscal equalization between states and the division of VAT revenues. The role of judicial institutions in interpreting and shaping vertical tax sharing arrangements deserves particular emphasis, as constitutional courts and supreme courts in many countries have issued landmark decisions that have fundamentally altered intergovernmental fiscal relations. In Canada, the Supreme Court's decision in *Reference Re Canada Assistance Plan* (1991) limited the federal government's ability to attach conditions to transfer payments, affecting the balance of power in vertical fiscal relations. In India, the Supreme Court's interpretation of fiscal federalism principles in cases like *S.R. Bommai v. Union of India* (1994) has influenced the nature of center-state financial relations. These judicial decisions highlight how legal frameworks operate not merely as technical rules but as living institutions that adapt and evolve through interpretation and application to new circumstances.

The examination of legal and constitutional frameworks for vertical tax sharing reveals how formal institutions shape the practical operation of intergovernmental fiscal relations, establishing the rules within which political and economic actors must operate. These frameworks reflect fundamental choices about the distribution of fiscal authority and responsibility, balancing competing values of centralization and decentralization, uniformity and diversity, efficiency and equity. As we move toward examining specific challenges and innovations in vertical tax sharing arrangements, understanding these legal foundations provides essential context for analyzing both the constraints on