

Monetary Standardization in the European Union

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ABSTRACT

This study investigates the design and production of Euro banknotes and coins, focusing on their role in shaping European identity, enhancing security, and promoting sustainability. The aim is to explore how integrating advanced security features with culturally rich narratives can transform the Euro into a symbol of unity and environmental responsibility. The research employs a mixed-methods approach, combining a comprehensive literature review, case studies of successful currency designs from various regions, and qualitative data gathered through surveys and interviews with stakeholders, including central bankers, designers, and the public. Findings indicate that the current design elements of Euro currency significantly influence public perceptions of European identity, with a strong preference for incorporating cultural and historical motifs. Additionally, the study reveals that advanced security features can enhance the durability and trustworthiness of the Euro, while environmentally sustainable materials can be adopted to reduce the ecological footprint of currency production. Overall, the conclusions suggest that a reimagined Euro, which harmonizes design, security, and sustainability, can serve not only as a medium of exchange but also as a powerful vehicle for fostering a shared European identity. This approach has the potential to enhance public trust in the currency and promote a sense of belonging among citizens, ultimately contributing to the broader goals of European unity and environmental stewardship. We recommend to introduce new Eurobills and Eurocoins in two tempi, and to draw lessons from Schweiz and Australia on the material in coins and the security features of the Eurobills. Euro cents of Princlings are not the thing. As Europe unites in its history, and geography under the European institutions. ad hocery on security and Schlampig coinage are out. Indeed, there are implications of the changeover for governance of the twin changeover:

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The Euro unites us – it's used by about 350 million people across 20 European Union countries. The euro is a beacon of stability and a symbol of European unity. It's also one of the most trusted currencies in the world. Here at the European Central Bank, we work to safeguard its value.

The euro banknotes and coins in our pockets are an everyday reminder of what the European Union means for us: greater freedom, convenience and opportunity. Euro cash is here to stay. However, we're also preparing for the possibility of a digital euro – we're making sure our currency keeps meeting people's changing needs.

Our euro banknotes symbolise the integration, openness and cooperation between the people of Europe. The design elements and security features make our banknotes unique.

-The ECB

INTRODUCTION

The evolution of economic integration within and across polities has consistently intertwined three interdependent dimensions: **financial union, the development of banking and capital markets, and the standardization of monetary systems**. Historically, the degree of monetary standardization—whether through a common currency, fixed exchange rates, or harmonized coinage—has both shaped and been shaped by the growth of financial networks and capital mobility.

Financial unions—formal or informal arrangements that integrate fiscal and financial systems across territories—have often emerged as mechanisms to facilitate trade, stabilize economies, and enhance political

cohesion. Examples range from the monetary arrangements of the Hanseatic League in medieval Northern Europe to the complex federal financial structures in modern states such as the United States or the European Union.

Banking and capital markets have historically functioned as both drivers and beneficiaries of such unions. The emergence of centralized banks, public debt markets, and interbank networks enabled polities to pool resources, mobilize investment across regions, and mitigate local financial shocks. In the Dutch Republic of the 17th century, for example, the combination of a unified monetary system and sophisticated public debt markets allowed Amsterdam to become the hub of global finance. Similarly, the expansion of British banking networks in the 18th and 19th centuries facilitated imperial trade and capital flows, even in the absence of formal monetary unification across colonies.

Monetary standardization, whether through gold or silver standards, currency boards, or later central bank coordination, has historically been essential for sustaining financial union. A common or convertible currency reduces transaction costs, fosters trust, and encourages cross-border lending and investment. Conversely, the lack of standardization often constrained capital mobility and limited the effectiveness of banking networks, as seen in fragmented medieval polities or in the interwar period's volatile exchange rate regimes.

Throughout history, the dynamic interplay among these three elements has shaped the trajectories of regional and global integration. Financial unions without sufficient monetary standardization often struggled with instability, while standardized currencies without robust banking and capital markets failed to catalyze sustained economic growth. Only when all three dimensions—integrated financial institutions, vibrant capital markets, and harmonized monetary systems—co-evolved did polities experience enduring economic and political cohesion.

Figure It is coming together



The proposed study aims to explore the intersection of currency design, cultural identity, and sustainability within the context of the Euro. It posits that the design of Euro banknotes and coins can significantly influence public perception of European unity, heritage, and environmental responsibility. By integrating advanced security features with culturally rich narratives, the Euro can serve as a powerful tool for fostering a shared European identity while addressing contemporary challenges such as counterfeiting and ecological sustainability.

The objective of the study is to analyze the current design elements of Euro banknotes and coins and their impact on public perception of European identity. It will investigate the effectiveness of advanced security features in enhancing the durability and trustworthiness of Euro currency. Additionally, the research aims to assess the potential for integrating cultural and historical motifs into currency design to promote inclusivity and regional representation. Furthermore, it will evaluate the environmental implications of material choices in the production of Euro banknotes and coins.

The study will focus on the design and production processes of Euro banknotes and coins, examining both current practices and proposed innovations. It will encompass:

- A review of existing literature on currency design and cultural symbolism.
- Case studies of successful currency designs from other regions.
- Surveys and interviews with stakeholders, including central bankers, designers, and the public.
- An analysis of environmental sustainability in currency production.

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Research Questions

1. How do the design elements of Euro banknotes and coins influence public perceptions of European identity and unity?
2. What advanced security features can be effectively integrated into Euro currency to enhance its durability and reduce counterfeiting?
3. In what ways can cultural and historical motifs be incorporated into Euro design to reflect the diverse heritage of European nations?
4. What are the environmental impacts of current materials used in Euro banknotes and coins, and how can these be improved?

This study is significant as it addresses the multifaceted role of currency in society, particularly in the context of the European Union. By examining the relationship between currency design, cultural identity, and sustainability, the research will contribute to the ongoing discourse on how monetary systems can evolve to meet contemporary challenges. The findings may inform policymakers and central banks in their efforts to create a Euro that not only serves as a medium of exchange but also embodies the values and aspirations of a united Europe, fostering a sense of belonging and responsibility among its citizens.

Litt review

The literature on monetary standardization and financial union is extensive, particularly regarding the economic and political rationale for the Euro, yet it often neglects the interplay between technical currency standardization and cultural perception. While macroeconomic indicators and political frameworks are well-explored, there is less attention on how design elements influence public trust, perceived legitimacy, or national identity. Comparative studies across different monetary unions are limited, particularly those examining how design, symbolism, and uniformity shape social cohesion beyond financial stability. Similarly, micro-level behavioral responses, such as how citizens perceive fairness, inclusion, or representation in currency design, remain underexplored.

In the realm of culture and identity, while scholars such as Ahmed (2004) and Graeber (2011) examine the social meaning of money, there is limited empirical work linking symbolic currency design to the formation of

European identity. The tension between pan-European identity and national symbolic expression is rarely analyzed, leaving gaps in understanding how citizens reconcile multiple layers of identity when interacting with currency.

Research on security and technology, including banknote anti-counterfeiting measures such as holograms, polymers, microprinting, and nanostructures, is well-developed in technical and industrial contexts. However, there is less integration of user perception, accessibility, and public trust in security features. Emerging technologies, such as blockchain-based verification, nanostructured optical security, and AI-powered counterfeit detection, are discussed primarily from an engineering perspective, with few studies evaluating their social or policy implications within the European monetary system.

Environmental sustainability is addressed in some works, such as McMillan (2020), yet comprehensive lifecycle assessments that combine materials, circulation, recycling, and overall environmental cost for both banknotes and coins are scarce. Connections between sustainable design choices and public perception or acceptance remain insufficiently studied.

Methodologically, most studies rely heavily on economic modeling, macro-financial indicators, or technical feasibility studies. There is a lack of qualitative or mixed-method research exploring citizens' perceptions, cultural engagement, or emotional responses to currency. Surveys on public trust and acceptance of Euro design are limited, and longitudinal studies tracking identity shifts over time in relation to currency exposure are rare. Cross-disciplinary methodologies combining political economy, design studies, anthropology, and security engineering are largely absent, leaving currency under-examined as both a technical artifact and a cultural symbol.

Theoretical gaps include the under-application of identity theory and monetary sociology to European currency. While nationalism and collective identity are well-studied, the role of material artifacts like coins and notes in shaping supranational identity is not fully theorized. Integrative frameworks linking monetary standardization, security technology, and cultural symbolism to political legitimacy and social cohesion remain underdeveloped. There is also limited theoretical exploration of the tension between security imperatives and cultural inclusivity, such as whether highly secure polymer notes might feel impersonal or alienating compared to traditional cotton-based notes.

Knowledge gaps are evident in how cultural motifs, national symbols, and inclusive design influence Euro acceptance across demographic groups, including marginalized communities and non-native EU residents. The interaction between emerging security technologies and user perception is poorly understood, leaving questions about whether more secure notes enhance trust or create confusion. Furthermore, there is insufficient integration of environmental sustainability, design innovation, cultural identity, and security considerations, which limits policymakers' ability to make evidence-based decisions that balance multiple priorities. Comparative international studies are also scarce, reducing opportunities to learn from other monetary unions or innovations in currency design and security.

In summary, the key gaps in the literature, theory, methodology, and knowledge revolve around the integration of culture, identity, security, and sustainability with monetary standardization. There is a need for empirical studies linking currency design to public perception and European identity, cross-disciplinary methodologies combining social, technical, and economic perspectives, research on user engagement with security technologies, and assessments that integrate environmental considerations with cultural and political objectives. Addressing these gaps would enable a more holistic understanding of the Euro as both a functional currency and a cultural artifact.

Scholarly Approach, Main Analytical Points, and Critique

A scholarly review of literature and technical sources on monetary standardization, financial union, culture, identity, sustainability, and security technology requires both **conceptual framing** and **empirical grounding**. Conceptually, the Euro is not merely an economic instrument but also a *symbolic object*, *cultural artifact*, and *technological system*. Empirically, banknotes and coins embody materials science, security engineering, and socio-cultural communication. Across this intersection, the literature reveals **gaps in theory, method, and**

integration — particularly regarding how technical features of currency resonate with, influence, or fail to capture, broader socio-cultural meanings and environmental values.

Sara Ahmed's *The Cultural Politics of Emotion* (2004) provides a foundational lens for understanding how **emotional narratives shape collective identities**. Ahmed argues that emotions are not private states but socially circulated forces that bind communities and delineate “us” versus “them.” Applying this perspective to currency design suggests that banknotes and coins can carry affective power — that *symbols, motifs, and design narratives* help shape feelings of belonging or alienation within a monetary union. However, Ahmed's work stops short of material artifacts such as currency, and thus lacks empirical engagement with **how specific design elements map onto emotional and identity formation among diverse European publics**. The gap here is the translation from **cultural theory to material semiotics of currency** — a step that remains largely unexplored in current research.

In *Money and the Politics of the Euro*, Helleiner (2003) situates the Euro within broader political and economic dynamics, emphasizing institutional interests, state power, and the politics of monetary integration. Helleiner's political economy approach enriches understanding of the Euro as a *project of governance*, yet it pays limited attention to the **cultural semiotics of currency design** or to how citizens' **perceptions and identities** are shaped by these designs. The focus on high-level political dynamics tends to eclipse *micro-level cultural reception*, creating a gap between **structural explanations of monetary union and everyday symbolic experience of money as cultural text**.

David Graeber's *The Power of Money* (often discussed through his wider anthropological work on money and debt) offers a broad critique of money as a social relations medium rather than a neutral economic tool. Graeber's work enriches the field by foregrounding **symbolic, social, and relational dimensions of money**. Yet, like Ahmed and Helleiner, Graeber does not engage deeply with **technology of bills and coins** nor with **the specific security features, materials, and printing technologies** that embed those social meanings in physical artifacts. Here too, the literature lacks empirical studies connecting **anthropological insights with the physicality and technical design of currency**.

Christine Desan's *Designing Money* expands the theoretical frame by bringing **design principles and inclusivity** into currency discourse. Desan emphasizes that monetary systems are not purely technical; they reflect **values, norms, and community practices**. Desan's work pushes to integrate **institutional design with normative concerns for representativeness**. However, her work is more conceptual and normative than technical; it does not provide comprehensive analyses of the **specific engineering, material science, and security printing techniques** now central to currency production.

David McMillan's *Sustainable Currency: The Future of Money* fills a crucial gap by foregrounding **environmental impacts** of currency production. His work brings ecological concerns into a domain traditionally dominated by economic and security considerations. Despite this, the sustainability literature has not fully bridged to the **technical literature on advanced materials, printing technology, and design** — meaning the field lacks **holistic lifecycle assessments** that connect sustainability, security, and cultural identity in one analytical frame.

Beyond these books, the **technical literature on banknote materials and security features** offers important context. Recent reviews of polymer banknotes examine **materials science, design, and printing technologies**, showing how polymer substrates enhance durability while offering new optical security capabilities (e.g., transparent windows and advanced optical effects) that traditional cotton and paper banknotes cannot easily match. These technical analyses demonstrate a shift toward **sustainable and high-security substrates** but also reveal a gap in connecting these materials innovations to **symbolic meanings or public perceptions** of money. Put differently, the literature on **material performance**, such as polymer resilience and security, rarely intersects with studies of **identity and cultural representation** in currency. ([MDPI](#))

Similarly, studies of coin security innovations illustrate the use of **alternative materials, complex edge designs, micro-engravings, latent images, nanotech coloring, and illuminating inks** to deter counterfeiting, yet these materials and design choices are rarely discussed in cultural or identity terms. The technical literature is oriented

toward **anti-counterfeiting efficacy** and **manufacturing constraints**, leaving unexamined how these features might *symbolize technological progress or exclusion* for various social groups. ([EKB Journals](#))

Security technology narratives also extend to advanced concepts such as *Dynamic Intelligent Currency Encryption* (DICE), which proposes tracking and remote devaluation of banknotes using embedded codes or RFID — a concept which, while technologically innovative, raises questions about privacy, trust, and the politics of surveillance that remain underexplored in both technical and social science literatures. ([Wikipedia](#))

Contemporary industry sources further highlight how sustainability and security can be balanced, as seen in innovations like **Green Banknote solutions** that use certified natural fibers, post-consumer recycled polyester threads, and vegetable-based inks to reduce carbon footprint while maintaining high security standards. These sources demonstrate **industry practice** but also show that scholarship has not fully engaged with **how sustainability innovations are mediated through design choices** or how they might affect *user perceptions of legitimacy and trust*. ([gi-de.com](#))

Critical gaps therefore emerge at several points: conceptual frameworks on money rarely incorporate the **technological materiality** of currency; technical histories and materials science rarely engage with **culture and identity theory**; environmental sustainability research lacks integration with **semiotic analyses** of currency meaning; and political economic accounts insufficiently address **micro-level perceptions and affective responses** to design and technology.

In methodological terms, most work remains siloed: political economy relies on institutional analysis, anthropology on ethnographic narrative, materials science on laboratory testing, and security engineering on counterfeiting metrics. Few studies adopt **mixed methods** that combine qualitative cultural analysis with **technical performance evaluation** or **public perception surveys** regarding security and sustainability features.

Theoretically, no comprehensive model currently bridges structural accounts of monetary union with **material-semiotic frameworks** that explain how the physical design and technology of currency embody and communicate *normative, cultural, and identity claims*. Similarly, the fields have not yet developed a robust theory of **currency as a socio-technical artifact** — one that simultaneously accounts for its economic functions, cultural meanings, material properties, ecological impact, and technological features.

Adding Value in Scholarly Terms

Adding scholarly value through the review of these books involves engaging critically, synthesizing themes, and linking insights to broader academic and practical contexts. First, critical analysis requires a careful examination of each text's arguments, methodologies, and conclusions, highlighting both strengths and limitations while assessing their relevance to the objectives of the current study. This approach ensures that the literature review is not merely descriptive but evaluative, positioning each work within ongoing debates on currency, identity, and monetary policy.

Second, interdisciplinary connections enhance scholarly value by linking the ideas presented in the texts to multiple fields, including economics, sociology, anthropology, design studies, and environmental science. By situating the literature at the intersection of these disciplines, the review broadens the scope of analysis, fostering a more comprehensive understanding of the social, cultural, and technical dimensions of currency design.

Third, thematic synthesis identifies recurring motifs across the reviewed works, such as the interplay of identity, sustainability, security, and technological innovation in monetary instruments. By synthesizing these themes, the review creates a cohesive narrative that illuminates the complex ways in which currency functions as both a technical artifact and a cultural symbol, strengthening the theoretical and conceptual framework of the study.

Fourth, practical implications are drawn by linking scholarly insights to real-world applications in currency design, policymaking, and financial governance. This translation from theory to practice enhances the relevance of the research, demonstrating how academic analysis can inform decisions about materials, security technologies, sustainability, and design choices in the Euro and other monetary systems.

Finally, adding scholarly value involves identifying gaps and proposing future research directions. By highlighting underexplored areas—such as the cultural perception of security features, the ecological footprint of currency, or the integration of symbolic and material aspects of money—the review not only contributes to academic discourse but also encourages further empirical and interdisciplinary investigation into the nexus of currency design, cultural identity, and technological innovation.

METHODOLOGY

The study adopts a mixed-methods design to explore how Euro banknotes and coins are conceived, produced, and interpreted, with particular attention to European identity, security, and sustainability. It begins with a comprehensive literature review that establishes the theoretical foundation by examining scholarship on currency design, cultural symbolism, and sustainable production. This is followed by a set of **case studies** focusing on currencies such as those of Canada, Australia, and New Zealand, allowing the research to extract lessons on integrating cultural motifs, advanced security features, and environmentally responsible practices.

Qualitative data collection forms the next layer of the methodology, using semi-structured interviews and surveys with central bankers, designers, policymakers, and members of the public. These conversations and responses illuminate perceptions of the Euro's current design, the role of cultural representation, and attitudes toward sustainability. The resulting material is examined through thematic analysis to identify recurring patterns, while the quantitative survey data is processed statistically to map broader trends in public preference.

The study then integrates insights from the literature, case studies, and empirical data to build a holistic understanding of how currency design intersects with identity, security, and ecological responsibility. This synthesis supports the development of recommendations for future Euro design. [Throughout the process, a [validation and feedback loop](#) with stakeholders—through workshops, consultations, or expert review—ensures that findings remain credible, relevant, and grounded in practitioner insight.]

The overall aim is to produce a multidimensional, evidence-based framework that can guide the evolution of Euro currency design in ways that strengthen symbolic meaning, enhance security, and support sustainability.

The practical purpose of the piece structure its content. First we lay out how to frame an analysis of monetary standardization under conditions of a multinational financial union. Second, we address the historical precedents in Europe concerning monetary orders. Third, we address the position of a central bank as the minor actor in a state apparatus balanced by its operating environment in the context of the evolution of the design of the Eurobills and coinage addressing the complementarity between bills and coins. Fourth, we address the various options on modernizing and streamlining the Euro paperbill and coinage mints. Fourth, we compare and evaluate on existing bills combining culture, nature and personalities. Fifth, we now have the possibility to examine how to present the themes in more depth and how they differentiate from each other. To deepen the study's analytical reach, two additional thematic sections are introduced: cultural significance **and** artistic design. The sixth section on cultural significance examines how banknotes and coins operate as carriers of collective memory, identity narratives, and political symbolism. It considers currency as a communicative medium through which states and supranational entities articulate belonging, heritage, and values. This dimension investigates how visual motifs, linguistic choices, and historical references shape public perceptions of Europeanness, and how the Euro negotiates the tension between national diversity and supranational cohesion. It also explores how citizens interpret these symbols in everyday use, and how currency design contributes to the lived experience of European identity.

Seventh, The artistic design of banknotes and coins occupies a unique position at the intersection of aesthetics, technology, and political imagination. Far from being merely decorative, the visual language of currency constitutes a form of public art—one of the few artistic systems encountered daily by every member of society. Its design choices shape how value, authority, and belonging are perceived and enacted in everyday life. In the European context, this artistic dimension becomes even more complex, as the Euro must articulate a shared identity without privileging any single national tradition. The result is a visual grammar that blends abstraction, symbolism, and architectural metaphor to evoke continuity, openness, and collective heritage.

Artistic design operates through a series of layered decisions: the selection of motifs, the composition of imagery, the orchestration of color palettes, and the integration of typographic systems. Each of these elements carries semiotic weight. Motifs—whether architectural, botanical, historical, or geometric—signal what a political community chooses to remember and what it chooses to project. Composition determines how these symbols interact, whether they convey hierarchy, harmony, or dynamism. Color choices influence emotional resonance and legibility, while typography anchors the currency in a particular aesthetic tradition, balancing modernity with gravitas.

In coins, the artistic challenge is intensified by the constraints of relief sculpture. Designers must translate complex symbolic narratives into a miniature, tactile medium where depth, shadow, and texture become primary expressive tools. Engraving styles—whether classical, modernist, or hybrid—shape how national identity and European belonging are inscribed into metal. The Euro's common reverse and nationally specific obverses create a dual aesthetic system: one that asserts supranational unity while allowing space for national artistic expression.

Banknotes, by contrast, offer a broader canvas for artistic experimentation. Their design must harmonize visual beauty with the technical demands of security features, which increasingly rely on micro-engraving, holography, color-shifting inks, and polymer substrates. The integration of these technologies requires a sophisticated choreography between art and engineering, where aesthetic coherence cannot be sacrificed to security, nor security to aesthetics. The most successful designs achieve a synthesis in which security features become part of the artistic vocabulary rather than intrusive additions.

Ultimately, artistic design in currency is a negotiation between symbolism, functionality, and political aspiration. It shapes how citizens encounter the state—or, in the case of the Euro, the supranational polity—in the intimate space of daily transactions. By examining this dimension, the study reveals how the Euro's visual language constructs a shared European imaginary, how it navigates the tension between unity and diversity, and how future redesigns might more fully express the cultural, ecological, and democratic values of the European project.

Eighth, the study advances a set of sixteen proposals exploring how nature, culture, and individual personalities can be meaningfully combined within a single banknote design. These proposals function as speculative design models, each experimenting with different ways of integrating ecological motifs, cultural narratives, and emblematic figures into a coherent visual and symbolic system. Together, they demonstrate the range of possibilities for creating a banknote that operates simultaneously as an artistic object, a cultural text, and a political gesture—one capable of expressing Europe's environmental commitments, its civilisational depth, and the human stories that animate its collective identity.

The ninth section examines the rapidly evolving technological landscape that is reshaping the design, production, and circulation of physical currency. While digital payments continue to expand, banknotes and coins remain essential instruments of trust, accessibility, and sovereignty. This section therefore explores how emerging technologies—ranging from advanced polymer substrates to nanostructured inks, AI-assisted design tools, and machine-readable features—can enhance the Euro's durability, usability, and symbolic resonance. It considers how innovations in printing, engraving, and material science open new possibilities for integrating complex imagery, dynamic color-shifting elements, and tactile markers that improve accessibility for visually impaired users. The analysis also addresses the interface between physical currency and digital infrastructures, such as automated cash-handling systems, authentication devices, and potential future interactions with a digital euro. By situating the Euro within this broader technological ecosystem, the section highlights how innovation can reinforce both the functional and symbolic dimensions of currency in a rapidly changing monetary environment.

The tenth section focuses on the security architecture of banknotes and coins, recognizing that credibility and trust depend on the public's confidence in the currency's integrity. It examines the multilayered security strategies that underpin modern banknote design, including holographic foils, micro-printing, intaglio textures, ultraviolet and infrared features, embedded threads, and optically variable inks. The section also considers the unique security challenges posed by coins, where bi-metallic structures, edge inscriptions, and electromagnetic signatures serve as key protective mechanisms. Beyond cataloguing existing technologies, the section analyzes how security features can be harmonized with artistic and symbolic design, ensuring that protective elements enhance rather than disrupt the visual coherence of the currency. It also reflects on the evolving threat landscape—such as high-resolution scanning, 3D printing, and sophisticated counterfeiting networks—and

evaluates how the Euro system can remain resilient through continuous innovation, cross-border coordination, and public education. Security is thus framed not merely as a technical requirement but as a core component of monetary sovereignty and public trust.

The eleventh section addresses the environmental footprint of currency production, situating the Euro within the EU's broader commitments to sustainability and circular-economy principles. It examines the ecological implications of substrate choice, ink composition, energy use, water consumption, and end-of-life disposal. The section evaluates the environmental performance of cotton-based paper versus polymer substrates, considering durability, recyclability, and lifecycle emissions. It also explores innovations such as plant-based inks, biodegradable security threads, and low-impact metallurgical processes for coin production. Beyond materials, the section considers the environmental impact of distribution, circulation, and destruction, including the potential for closed-loop recycling systems and greener logistics. Importantly, it frames sustainability not as a constraint but as an opportunity to align the Euro's physical form with the EU's ecological values. By integrating environmental considerations into the core of currency design, the Euro can embody a forward-looking vision of responsibility, resilience, and stewardship.

The conclusions draw together the study's central findings and articulate why a comprehensive reform of Euro banknotes and coinage is both timely and necessary. The analysis demonstrates that currency design is not a peripheral aesthetic exercise but a structural component of political cohesion, public trust, and European identity. Reform is therefore required not only to support the member states individually, but—by implication—to strengthen the political center of the Union itself. A renewed, unitary design language for both bills and coins would help consolidate the Euro as a shared civic artifact, reducing fragmentation and reinforcing the sense of belonging to a common political and cultural project.

At the same time, the study shows that the current security architecture of Euro banknotes, while robust, must evolve in response to rapidly advancing counterfeiting technologies. A considerable strengthening of security features—integrated seamlessly into the artistic and symbolic vocabulary of the new series—is essential to maintain public confidence and safeguard the integrity of the monetary system. This includes not only technical enhancements but a more sophisticated fusion of security and design, where protective elements become part of the narrative and aesthetic coherence of the currency.

Finally, the conclusions emphasize the importance of initiating a preliminary, structured search for appropriate European-national symbols and motifs for the next coinage series. This process must balance the Union's supranational aspirations with the cultural richness of its member states, identifying imagery that resonates across borders while acknowledging the plurality of European heritage. Such a symbolic renewal would allow the Euro to speak more clearly to the lived experience of Europeans, embedding shared values, ecological commitments, and historical depth into the everyday materiality of money.

Taken together, these arguments make the case for a forward-looking reform agenda that unites technological innovation, political integration, and cultural expression. The Euro, as both a functional instrument and a symbolic medium, must evolve to reflect the Europe it serves—and the Europe it seeks to become.

Proposed Scholarly Framework: Currency as a Socio-Technical and Cultural Artifact

This framework conceptualizes Euro banknotes and coins as multi-dimensional artifacts that simultaneously embody economic, cultural, technological, and environmental properties. Currency is treated not merely as a medium of exchange but as a socio-technical system that communicates identity, reflects policy priorities, and shapes public perception. Drawing on Ahmed (2004), Graeber (2011), and Desan (2021), the framework foregrounds cultural and emotional dimensions, emphasizing how motifs, symbols, and design elements contribute to collective European identity and belonging.

Building on recent literature on banknote and coin technologies (Rafiei et al., 2023), the framework integrates materials science, printing technologies, and security features into the analysis. Banknotes are evaluated by substrate type, such as cotton versus polymer, their durability, and embedded security mechanisms including holograms, microprinting, and transparent windows. Coins are examined through alloy composition, magnetic

properties, and edge engraving. Sustainability is explicitly considered through lifecycle assessment of materials, recycling potential, and energy consumption in production (McMillan, 2020).

The framework emphasizes interdisciplinary connections among economics, political science, anthropology, design studies, and environmental science. Political economy perspectives (Helleiner, 2003) contextualize currency within the Eurozone's governance and integration challenges, while anthropological and sociological insights (Graeber, 2011; Ahmed, 2004) illuminate how currency functions as a cultural artifact shaping identity, trust, and social relations. Design studies (Desan, 2021) guide considerations of inclusivity, aesthetic coherence, and public engagement, while environmental science informs the sustainable selection of materials and production processes.

A key component of the framework is citizen-centered analysis, examining how design, motifs, and security features are perceived across demographic and cultural groups. This includes qualitative approaches such as focus groups, visual analysis, and ethnography, as well as quantitative surveys measuring trust, recognition, and attachment to symbolic elements of the Euro. The framework explicitly addresses the tension between technical sophistication, such as advanced security features, and cultural legibility, assessing how complexity may enhance or reduce perceived legitimacy and emotional connection.

Analytical dimensions include identity and culture, examining how motifs, symbols, and narratives foster or hinder a shared European identity; security and technology, assessing how embedded features prevent counterfeiting, ensure durability, and interact with public perception; sustainability and materials, considering how production, circulation, and recycling impact environmental performance and public acceptability; and policy and practical application, exploring how insights from design, technology, and cultural reception inform monetary policy, governance, and future currency development.

The framework identifies key gaps for empirical and theoretical research, including the cultural reception of advanced security technologies, longitudinal studies of identity formation via currency, integration of sustainability with technical performance, and cross-national comparative analyses of monetary design. Addressing these gaps supports both scholarly advancement and practical policy-making in the Eurozone and other monetary unions.

Methodologically, the framework recommends mixed methods that combine technical evaluation of banknotes and coins, qualitative analysis of public perception, quantitative surveys on trust, identity, and recognition of cultural motifs, and policy analysis of regulatory and governance frameworks impacting currency design and production.

Overall, this framework positions Euro currency as a convergence point of culture, technology, sustainability, and identity, offering a comprehensive lens to evaluate both its practical and symbolic functions.

Historical Evolution of Monetary Unions



European numismatic history unfolds as a long arc in which coinage serves as a primary medium through which sovereignty is asserted, standardisation is negotiated, and financialisation gradually takes hold. In the ancient world, Greek city-states used coinage as a compact declaration of civic autonomy: each polis struck its own

emblem, turning metal into a portable form of political identity. Hellenistic kingdoms intensified this logic by placing divine kingship on their coins, while Rome transformed numismatics into a continental propaganda system, broadcasting imperial legitimacy and military authority across Europe. In this early phase, sovereignty is inseparable from the right to mint; the coin is the state made tangible.

After the collapse of Rome, Europe enters a fragmented monetary landscape in which authority is unstable and coinage reflects that instability. Regional rulers, bishops, and cities issue small, inconsistent silver pieces whose hybrid Christian-pagan iconography mirrors the transitional nature of sovereignty itself. Byzantium remains the exception, maintaining a stable gold and bronze system that radiates imperial continuity into a disordered continent. Here, standardisation is largely absent; monetary plurality expresses political plurality.

The Carolingian reform marks a decisive shift. Charlemagne's introduction of the silver denarius creates the first truly pan-European monetary standard, a unifying architecture that outlives the empire that produced it. The denarius system becomes the backbone of European coinage for centuries, demonstrating how standardisation can outlast political structures and even serve as a proto-institutional framework for later integration. In this period, sovereignty is increasingly expressed through the ability to maintain a stable standard rather than merely to mint.

The High Middle Ages bring a new dynamic: the rise of commercial cities and long-distance trade networks. Italian city-states introduce high-value gold coins such as the florin and the ducat, which become trusted instruments of Mediterranean and European commerce. Monetary authority becomes plural again, but now in a context of expanding markets rather than political fragmentation. The Hanseatic League and other regional networks create functional monetary zones that operate alongside princely sovereignty. This is the beginning of financialisation in the European sense: coinage becomes not only a symbol of authority but a tool for credit, trade, and capital accumulation.

The Renaissance and early modern period deepen this transformation. Monarchs adopt realistic portraiture to assert dynastic legitimacy, while expanding empires—especially Spain—create the first global currency systems. The “pieces of eight” circulate across Europe, the Americas, and Asia, demonstrating how monetary standardisation can become a vector of imperial power. Here, sovereignty and financialisation converge: the state's authority is projected through a currency that facilitates global trade and colonial extraction.

By the seventeenth to nineteenth centuries, industrialisation and the rise of nation-states produce uniform national coinage systems. The Latin Monetary Union attempts to harmonise European currencies, foreshadowing later supranational projects. Standardisation becomes a political project, not merely a technical one, and financialisation accelerates as banking, credit, and capital markets expand. Coinage begins to lose its monopoly as the primary monetary instrument, but it retains its symbolic role as the state's most visible signature.

The twentieth century brings ideological volatility. Regime changes, wars, and revolutions reshape coin iconography, turning numismatics into a record of political rupture. After 1945, European reconstruction and integration gradually shift the symbolic centre of gravity from national sovereignty to shared institutions. The euro represents the culmination of this trajectory: the first large-scale supranational currency in modern history. Its design balances national identity on one side with a unified European narrative on the other, embodying a negotiated sovereignty in which monetary authority is pooled rather than surrendered. Standardisation becomes continental; financialisation becomes institutionalised; sovereignty becomes layered.

In comparative perspective, Europe's numismatic history differs from other regions in three key ways. First, sovereignty is unusually plural and negotiated, producing a long tradition of overlapping monetary authorities rather than a single imperial centre. Second, standardisation emerges cyclically—first under Rome, then under Charlemagne, then under the Latin Monetary Union, and finally under the euro—each time creating a new political order. Third, financialisation develops not as a rupture but as a gradual extension of commercial and urban autonomy, culminating in the modern European financial system where currency, markets, and institutions form an interdependent architecture.

European numismatic history unfolds as a long arc in which coinage serves as a primary medium through which sovereignty is asserted, standardisation is negotiated, and financialisation gradually takes hold. In the ancient world, Greek city-states used coinage as a compact declaration of civic autonomy: each polis struck its own

emblem, turning metal into a portable form of political identity. Hellenistic kingdoms intensified this logic by placing divine kingship on their coins, while Rome transformed numismatics into a continental propaganda system, broadcasting imperial legitimacy and military authority across Europe. In this early phase, sovereignty is inseparable from the right to mint; the coin is the state made tangible.

After the collapse of Rome, Europe enters a fragmented monetary landscape in which authority is unstable and coinage reflects that instability. Regional rulers, bishops, and cities issue small, inconsistent silver pieces whose hybrid Christian-pagan iconography mirrors the transitional nature of sovereignty itself. Byzantium remains the exception, maintaining a stable gold and bronze system that radiates imperial continuity into a disordered continent. Here, standardisation is largely absent; monetary plurality expresses political plurality.

The Carolingian reform marks a decisive shift. Charlemagne's introduction of the silver denarius creates the first truly pan-European monetary standard, a unifying architecture that outlives the empire that produced it. The denarius system becomes the backbone of European coinage for centuries, demonstrating how standardisation can outlast political structures and even serve as a proto-institutional framework for later integration. In this period, sovereignty is increasingly expressed through the ability to maintain a stable standard rather than merely to mint.



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Financial Union and standardisation



The historical evolution of economic integration across polities demonstrates a persistent and intricate relationship among financial union, the development of banking and capital markets, and the standardization of monetary systems. These three dimensions have mutually reinforced one another, shaping both the stability and the growth potential of economies over time. Financial unions, whether formal or informal, have typically emerged as mechanisms to facilitate trade, mobilize capital, and coordinate fiscal and monetary policies across regions. Yet their success has often depended on the simultaneous presence of robust banking institutions and capital markets, as well as consistent monetary standards capable of fostering trust and predictability in economic transactions.

The Hanseatic League, which flourished between the thirteenth and seventeenth centuries in Northern Europe, exemplifies an early form of financial union in a fragmented political landscape. Although the League comprised a loose federation of independent trading cities, its economic cohesion rested on the development of merchant credit networks and the widespread use of bills of exchange. These financial innovations allowed for the efficient movement of capital across city-states, while the adoption of standardized silver and gold coins, such as the Lübeck and Hamburg marks, provided a common medium of exchange that reduced transaction costs and facilitated cross-city trade. In this context, monetary standardization functioned as both a precondition and an outcome of financial and commercial integration.

The Dutch Republic in the seventeenth century offers a more advanced illustration of the interdependence between financial integration and monetary stability. Regional markets within the Republic were highly

interconnected, supported by the creation of the Amsterdam Stock Exchange and the Bank of Amsterdam, which introduced the first modern deposit-based banking system. Public debt instruments, traded efficiently through well-organized capital markets, allowed the state to mobilize resources for both domestic and international purposes. The stability of the monetary system, underpinned by a reliable gold and silver standard, facilitated trust in these financial instruments and enabled capital to circulate freely, reinforcing both domestic cohesion and international competitiveness.

The United Kingdom and its empire in the eighteenth and nineteenth centuries further demonstrate the critical role of monetary standardization in sustaining expansive financial networks. London emerged as a dominant global financial center, supported by joint-stock banks, insurance institutions, and a well-regulated stock exchange. The adoption of the gold standard in 1816 anchored the domestic and colonial currencies, creating stable exchange rates that allowed capital to flow efficiently across regions. Banking and capital markets were therefore both a driver and a beneficiary of monetary standardization, enabling the British economy to integrate financial operations at an unprecedented scale while supporting imperial trade.

Similarly, the development of the United States' financial union in the nineteenth and early twentieth centuries illustrates how federal monetary and banking structures can enhance economic cohesion. The National Banking Acts of 1863 and 1864 established a system of nationally chartered banks and created mechanisms for uniform currency issuance, which helped unify previously fragmented state-level financial systems. Interbank networks and national bond markets facilitated the mobilization of capital, while adherence to the gold standard provided a credible monetary anchor. In this case, monetary standardization and banking development were mutually reinforcing: the federal currency system stabilized financial transactions, while integrated banking and capital markets enabled the broad dissemination and circulation of that currency.

The Latin Monetary Union of 1865 represents an early but ultimately unsuccessful attempt at supranational monetary integration. France, Belgium, Italy, and Switzerland agreed to adopt a bimetallic standard and sought to facilitate cross-border capital flows through standardized coinage. However, differences in fiscal discipline and uneven banking development among the member states undermined the Union, illustrating that monetary standardization alone is insufficient to sustain financial integration without complementary institutional and market structures.

The global gold standard era, roughly from the 1870s to 1914, demonstrates how informal monetary standardization can underpin international financial integration. Capital markets across Europe and the United States became increasingly interconnected, with London functioning as the principal hub for global finance. Gold convertibility provided predictable exchange rates, facilitating long-distance trade and cross-border lending. Banking institutions and financial intermediaries thrived in this environment, highlighting the mutually reinforcing nature of monetary stability and capital market expansion.

The Bretton Woods system established in 1944 represents a coordinated attempt to institutionalize these dynamics on a global scale. Major industrial powers created international financial institutions, such as the International Monetary Fund and the World Bank, to stabilize postwar economies and promote cross-border investment. Fixed exchange rates pegged to the U.S. dollar, which remained convertible to gold, provided the monetary stability necessary for the expansion of international capital markets. Banking systems adapted to these structures, facilitating global lending and economic reconstruction, illustrating how institutionalized financial and monetary integration can foster systemic economic growth.

Contemporary Europe exemplifies the culmination of these historical patterns through the European Economic and Monetary Union and the European Central Bank. The adoption of the euro by member states represents an unprecedented level of monetary standardization, while EU-wide banking regulations and initiatives such as the Capital Markets Union have sought to integrate financial institutions and capital markets across national boundaries. The European experience demonstrates that the sustainability of financial unions depends not only on formal monetary integration but also on robust banking structures and deep, liquid capital markets that can absorb shocks and promote long-term investment.

In summary, historical evidence consistently indicates that financial union, banking and capital market development, and monetary standardization are deeply interdependent. Financial integration facilitates the growth of capital markets, while standardized monetary systems reduce transaction costs and build trust, reinforcing banking operations and investment flows. Across time and polities, the co-evolution of these

dimensions has proven essential for economic stability, growth, and the capacity of states and regions to participate effectively in broader networks of trade and finance.

We will now proceed to examine concepts for the design of the new Eurobills and also address the question of a more standardized coin-series to replace the parochial versions currently in vogue in a rather inconsistent manner, comparable to our working method at the desk.

Mid-2025 the design competition closed initially, as you may discern on the basis of two different proposals, one on European culture and personalities, and another on “rivers and birds”. I take issues with this bifurcation, in the belief culture, personalities and animals could be a throughgoing motive for the new money series and at the same time a certain standardization of the coinage series would be welcome.

At the end of 2026, the selected designers will have finished their offers on the design, and the jury have spoken¹. Indeed, by 2028 the capital markets union and banking union must be complete for the introduction to leave time for discussions on the design of the debt management office in the ECB, to unlock growth and to see through the change of bills and coins, a task not to be neglected as a minor challenge. It is a huge operation to change bills in a large economy as the Euro.

Outside the Eurozone, many countries **combine human figures, cultural motifs, and nature/animal imagery on their currency**. Examples include São Tomé and Príncipe, Denmark (historical), Brazil, New Zealand, Fiji, and South Africa. These designs often place **portraits on one side and wildlife or natural scenes on the other**, or combine them on a single note. Globally, such hybrid designs are common, especially in national currencies, contrasting with the **ECB’s banknote policy**, which deliberately selects a single thematic universe per series. Coins often allow greater thematic plurality, but banknotes in the eurozone avoid mixing culture and nature.

Two possibilities:

(1) Eurobills with culture, nature and personalities and standardized coinage, comparable to where they are actually being minted.

(2) Eurobills with culture and personalities, and nature and animals in the coinage series. We argue for the primary option, but this then raises the question how to proceed on coinage and the rules to adopt for their motifs. As you may discern things are not that simple, there are some choices to be made.

European Coinage Between Unity and Diversity: Institutional Design, Historical Continuity, and Future Integration

In the Eurozone, the governance structure for banknotes combines central strategic oversight with decentralised production. The European Central Bank (ECB) has the exclusive legal authority to authorise the issuance of euro banknotes across the euro area. The ECB sets overall policy, approves production plans, determines denominations, and establishes common security standards. However, the ECB itself does not operate as a printing office or handle physical cash.

The actual production and circulation of euro banknotes are carried out by the national central banks (NCBs) of euro area countries. Each NCB is responsible for printing and distributing banknotes, withdrawing worn notes, and managing stock levels. The allocation of production volumes across NCBs is determined jointly through forecasts prepared by the NCBs and approved by the ECB’s Governing Council.

Oversight and harmonisation are provided by the ECB to ensure that all banknotes meet uniform quality and security standards. All production facilities used by NCBs must comply with ISO-based quality management systems and inspection procedures coordinated by the ECB. Security features, anti-counterfeiting measures, and operational procedures are standardised across the Eurosystem to maintain public trust and currency integrity.

The euro system separates strategic and operational roles. The ECB has the legal authority and oversight function, while the NCBs carry out the operational tasks of printing, distributing, quality control, and stock

¹ <https://www.ecb.europa.eu/press/pr/date/2025/html/ecb.pr250715~39f757470b.en.html>

management. Coins are minted by national governments with ECB approval for total annual values. Risk management, including counterfeiting prevention and quality control, is jointly handled by the ECB and the NCBs.

In comparison with a hypothetical centralised mint authority, the Eurozone model achieves the same objectives: independent strategic oversight, high-quality production, rigorous security, accountability, and collaboration. The main difference is that instead of a single mint, the Eurozone relies on a network of NCBs coordinated by the ECB, providing both efficiency and redundancy while maintaining uniform standards across all member states.

Most banknotes are not made of regular paper. They use cotton fiber or cotton blends, which makes them more durable, longer-lasting, and resistant to tearing. Higher-value notes often use even higher-quality materials.

Higher-value banknotes include extra security elements to prevent counterfeiting, such as watermarks, security threads, holograms, special inks and raised printing, microprinting, and UV-reactive elements.

Banknotes are printed using precise techniques, especially intaglio printing, which gives raised textures you can feel. These methods are expensive but make counterfeiting very difficult.

The more complex and secure a banknote is, the higher its production cost. For example, a €5 note costs roughly €0.10–0.20 to produce, while a €100 or €200 note with all security features may cost €0.30–0.40.

Denomination	Paper Material	Security Features	Production Cots
€5	Cotton fiber	Watermark, security thread, raised printing	€0.10–0.15
€10	Cotton fiber	Watermark, hologram, security thread	€0.15–0.20
€20	Cotton fiber	Watermark, security thread, hologram, UV ink	€0.20–0.25
€50	Cotton fiber	Watermark, security thread, hologram, microprint	€0.25–0.30
€100	Cotton fiber + security enhancements	Watermark, hologram, security thread, microprint, UV ink	€0.30–0.40

Implications for New European Issuers

New European banknote issuers must invest in high-quality paper and advanced printing technology to ensure durability and security. Uniform security standards are critical to maintain public trust and prevent counterfeiting across borders. Higher production costs for secure banknotes require careful budgeting and may influence decisions on denominations issued. Collaborating with established mints and adopting best practices can reduce technical risks and improve efficiency in producing high-quality notes.

Eurocoinage

The design and governance of euro coinage represent a distinctive institutional compromise between monetary unification and cultural plurality. Unlike euro banknotes, which are fully centralized in both design and issuance logic, euro coins deliberately retain a dual identity structure. This structure is anchored in a common European side, symbolizing monetary unity, and a national side, reflecting the continued role of Member States in expressing historical, cultural, and symbolic sovereignty within the Economic and Monetary Union (EMU). The European Central Bank (ECB), together with the European Commission, oversees the overall framework governing euro coin issuance, but the authority over iconography on national sides remains largely decentralized. This arrangement is neither accidental nor purely aesthetic; it emerges from a long European tradition of plural coin circulation and reflects deeper political choices about identity, legitimacy, and subsidiarity in the euro area.

From an institutional perspective, the ECB's competence over euro coins is limited primarily to the approval of issuance volumes and the safeguarding of technical standards. While euro banknotes fall under a single design regime and are issued by the Eurosystem, euro coins are legally issued by Member States, albeit subject to ECB approval regarding quantities placed into circulation. The visual identity of the coins is governed by EU-level recommendations and Council decisions rather than by direct ECB control. All euro coins must feature a

common side, identical across the euro area, depicting the denomination and a map of Europe surrounded by the twelve stars of the European Union. The national side, by contrast, is determined by each issuing state, provided that it respects a limited set of common rules: the inclusion of the twelve stars, the indication of the issuing country, and compliance with restrictions on the frequency of design changes.

This dual structure is best understood as the outcome of Europe's historical experience with multiple coinages circulating simultaneously within local and regional economies. For centuries, European markets functioned with overlapping monetary instruments: local coins, dynastic currencies, imperial coinage, and foreign specie often circulated side by side. Trust in money was not derived from uniformity alone, but from recognisability, authority, and embeddedness in political and cultural contexts. Even well into the nineteenth and early twentieth centuries, monetary unification across Europe was partial and uneven, with systems such as the Latin Monetary Union attempting, and ultimately failing, to reconcile national sovereignty with common standards. The euro's coinage system consciously echoes this layered monetary history by allowing national symbols to circulate freely across borders, thus transforming what were once local markers of authority into shared European artefacts.

The content of the euro cent coins illustrates this hybrid logic particularly clearly. On the common side, all cent denominations—ranging from one cent to fifty cents—display a standardized European map motif, which was updated to reflect successive enlargements of the Union. The smallest denominations, namely the one, two, and five cent coins, portray Europe on a globe, emphasizing the Union's position within a wider global context. Higher cent denominations feature a more detailed continental map, visually reinforcing the internal cohesion of the European space. The common side is therefore explicitly geopolitical: it situates Europe spatially and symbolically as a unified economic area.

The national sides of euro cent coins, however, reveal a wide spectrum of symbolic choices. Member States have used small denominations to showcase national fauna, heraldic symbols, ancient scripts, archaeological artefacts, and historically significant figures. These motifs are often deeply rooted in national narratives and collective memory, and in many cases consciously echo pre-euro coin designs. Larger denominations tend to feature more prominent national symbols, such as coats of arms or well-known cultural figures, while the €1 and €2 coins often carry the most politically resonant imagery. Although all these coins circulate freely across the euro area, their visual language remains nationally coded, producing a currency that is functionally unified but symbolically fragmented.

This fragmentation has generated an ongoing debate about whether the euro coin system sufficiently reflects the depth of European integration. Critics argue that the predominance of national symbolism weakens the emergence of a shared European monetary identity. While the common side provides a minimal unifying element, it is often perceived as abstract and technocratic, especially when contrasted with the rich iconography of national sides. Joint €2 commemorative coins—issued to mark EU-wide anniversaries or milestones—demonstrate that pan-European symbolism is both feasible and well received, yet such initiatives remain exceptional rather than structural.

Against this background, there is growing scope for rethinking euro coinage as a more explicitly European project. One possible direction would involve rebalancing the symbolic weight between national and European elements. Rather than eliminating national sides altogether, a future reform could introduce stronger European thematic coherence across denominations, for example by dedicating certain series to shared European cultural, scientific, or environmental themes. These could be selected through EU-wide design competitions or deliberative processes, thereby enhancing democratic legitimacy and public engagement. Over time, such an approach would allow euro coins to narrate a collective European story rather than a juxtaposition of national ones.

A second, more structural reform concerns the physical production of euro coins. At present, most euro area states maintain national mints, even though their output increasingly serves a pan-European circulation. This duplication reflects historical prerogatives rather than functional necessity. A future-oriented model could envisage the concentration of minting capacity into a limited number of European minting hubs—potentially five strategically distributed facilities across the euro area. Such hubs could be located in long-established minting countries with existing capacity and expertise, serving the entire euro area under a coordinated governance framework. Centralizing minting would generate economies of scale, enhance quality control, and

symbolically reinforce the euro as a genuinely European public good, while allowing Member States to retain a role in design input and commemorative issues.

Institutionally, such reforms would require the establishment of a more formalized European coin governance structure. A European Coin Board, operating under the joint auspices of the ECB and the European Commission, could coordinate design cycles, oversee symbolic coherence, and manage the balance between national representation and European identity. Member States would remain stakeholders, but within a framework that treats euro coinage as a shared cultural and monetary infrastructure rather than a collection of parallel national outputs.

Beyond questions of symbolism and institutional governance, euro coinage also raises increasingly salient issues related to material sustainability, lifecycle durability, and the political economy of metallic money. Coins are not merely symbolic artefacts; they are industrial products whose material composition, production processes, and longevity have direct implications for environmental impact, public expenditure, and the operational efficiency of the monetary system. As the European Union advances ambitious climate and circular economy objectives, the euro coin system represents a largely overlooked but potentially significant domain for sustainability-oriented reform.

The current euro coin series is composed of a range of metallic alloys selected primarily for durability, recognisability, and resistance to counterfeiting. The lowest denominations—1, 2, and 5 cent coins—are manufactured from copper-plated steel. This choice reflects a deliberate shift away from solid copper, which would be prohibitively expensive, toward a steel core that reduces material costs while maintaining the visual and tactile properties traditionally associated with copper coinage. The intermediate denominations—10, 20, and 50 cent coins—are struck in “Nordic gold,” an alloy consisting primarily of copper, aluminium, zinc, and tin. Despite its name, Nordic gold contains no actual gold; it was chosen for its colour stability, corrosion resistance, and hypoallergenic properties. The €1 and €2 coins employ bimetallic constructions, combining copper-nickel and nickel-brass alloys to enhance security and machine readability.

From a durability standpoint, these material choices have proven effective. Euro coins are designed to remain in circulation for several decades, with estimates commonly ranging from 20 to 30 years for higher denominations, and somewhat shorter lifespans for the smallest cent coins due to higher handling intensity and loss rates. Copper-plated steel, while cost-efficient, is more vulnerable to surface wear, particularly in humid or abrasive environments, which can eventually expose the steel core and accelerate corrosion. Nordic gold alloys, by contrast, exhibit high resistance to oxidation and mechanical degradation, contributing to longer circulation lifespans and lower replacement rates. Bimetallic coins demonstrate the greatest durability and are rarely withdrawn due to material failure, with withdrawals more often driven by changes in design or security requirements.

So much more, New Caledonia has opted for a Guadeloupian association with France-EU, there seems to be a reason to review the sustainability of production lines and their impact on the durability of coins. Very often the smaller coins oxidize while corrosion is less certain for the big coins.

The durability of coinage has direct economic implications. Coins that remain in circulation for extended periods reduce the frequency and cost of reminting, transport, and distribution. Conversely, low-denomination coins—particularly the 1 and 2 cent pieces—exhibit disproportionately high production and handling costs relative to their face value. These coins are frequently lost, hoarded, or discarded, leading to continuous demand for replacement minting. From a systems perspective, this creates a paradox: the smallest coins are among the least durable in circulation terms, yet require sustained industrial input. This dynamic has already prompted several euro area states to adopt rounding practices that reduce the effective circulation of the smallest denominations without formally abolishing them.

Sustainability concerns amplify these economic considerations. Traditional coin production is energy-intensive, involving mining, refining, alloying, striking, and distribution processes that generate significant carbon emissions and environmental externalities. Copper and nickel extraction, in particular, are associated with substantial ecological footprints, including land degradation, water pollution, and high energy consumption. As such, the material lifecycle of euro coins increasingly sits uneasily with the EU’s broader commitments to decarbonisation and resource efficiency.

A transition toward a more sustainable euro coin production line would therefore require intervention at multiple stages of the value chain. At the material level, greater reliance on recycled metals represents a key opportunity. Steel cores, copper plating, and copper-based alloys can all be produced with high recycled content without compromising functional performance. Mandating minimum recycled material thresholds for euro coin alloys could significantly reduce upstream environmental impacts while maintaining durability standards. Advances in metallurgical engineering also open the possibility of alternative alloys that reduce reliance on environmentally intensive metals while preserving corrosion resistance and electromagnetic properties required for vending and payment systems.

At the production level, sustainability gains could be achieved through the modernization and consolidation of minting infrastructure. Concentrating minting activity in a limited number of high-capacity European hubs, as discussed earlier, would facilitate investment in energy-efficient presses, electrified furnaces, and renewable-powered production lines. Such concentration would also enable closed-loop material systems, whereby withdrawn or damaged coins are systematically recollected, melted down, and reintegrated into new coin production within the same facilities. This circular approach would align euro coinage with the EU's broader circular economy framework and reduce dependence on primary raw materials.

Durability and sustainability are closely linked in this context. Extending the functional lifespan of coins reduces the need for replacement minting and lowers cumulative environmental impact. Design choices that prioritize wear resistance, surface integrity, and corrosion protection therefore have both economic and ecological benefits. At the same time, excessively durable low-denomination coins may be economically inefficient if their social utility is declining. This tension suggests that sustainability-oriented reform must be coordinated with denomination policy, potentially reinforcing the case for phasing out or marginalizing the smallest cent coins while investing in long-lasting materials for higher denominations.

Finally, the political economy of euro coin materials cannot be ignored. Decisions about alloys, sourcing, and production standards intersect with industrial policy, strategic autonomy, and supply chain resilience. A more sustainable euro coinage system could prioritize European sourcing of recycled metals, support domestic metallurgical industries, and reduce exposure to volatile global commodity markets. In this sense, material reform is not merely a technical adjustment but part of a broader redefinition of the euro as a strategic European public good—economically efficient, environmentally responsible, and symbolically aligned with the Union's long-term objectives.

In sum, the current euro coinage policy reflects a historically informed compromise that prioritizes political acceptability and continuity over symbolic integration. It has succeeded in ensuring trust, recognisability, and smooth circulation across diverse economies. Yet as the euro matures and European integration deepens, the symbolic and institutional logic of coinage increasingly appears misaligned with the reality of a highly integrated monetary space. Moving toward a more European coinage—both in design and production—would not negate national identities, but rather situate them within a shared narrative of European unity, mirroring the economic and political interdependence that the euro itself embodies.

In turn, the material composition, durability, and sustainability form a critical but under-theorized dimension of euro coinage policy. Addressing these issues would allow the euro's physical infrastructure to better reflect the environmental, economic, and political realities of twenty-first-century Europe, complementing parallel efforts to strengthen its symbolic coherence and institutional governance.

Material choices in euro coinage also have strategic implications. Decisions about metals, sourcing, and production affect industrial policy, supply chain security, and Europe's dependence on global commodity markets. A more sustainable euro coin system could prioritise recycled and European-sourced materials, support domestic industry, and reduce exposure to external shocks pace solutions to the problem of coins miscolouring, oxidization or in worst case tarnishing, something that is rare.

In this sense, reviving the materials and production of euro coins is not just a technical issue. It is part of a broader effort to align the euro's physical infrastructure with the EU's economic, environmental, and strategic objectives. By improving sustainability and durability, euro coinage can better reflect the long-term values and priorities of the European Union.

Complementarity in the Design of Banknote and Coin Series: An Academic Treatment

In numismatic scholarship, the relationship between the designs of banknotes and coins is often understood through a set of informal yet widely observed principles. These principles do not constitute a codified rulebook, but they have emerged through long practice, institutional convention, and the practical constraints of minting and printing. Together, they shape what numismatists refer to as *complementarity*—the way in which the two media, metal and paper, form a coherent national currency system.

A foundational concept is thematic cohesion. Nations tend to articulate a unified cultural or historical narrative across their circulating currency, yet they distribute this narrative differently between coins and banknotes. Coins, constrained by their small surfaces and the physical demands of relief engraving, typically carry emblematic or symbolic imagery: coats of arms, national fauna, stylized motifs, or the effigy of a head of state. Banknotes, by contrast, offer a larger and more flexible canvas, allowing for complex scenes, portraits, architectural depictions, and textual elements. The result is a division of labor in which coins express the distilled symbols of national identity, while banknotes elaborate the broader cultural story.

This division is reinforced by a hierarchy of complexity. Coins must withstand decades of circulation and therefore favor bold, simplified forms that remain legible under wear. Banknotes, printed with fine lines, microtext, and layered security features, can sustain a far higher level of detail. Numismatists often describe this as a gradient: the coinage provides the structural rhythm of the currency system, while the banknotes supply its narrative richness.

Another principle concerns redundancy. Although monarchies may repeat the sovereign's portrait across both media, most modern currency systems avoid duplicating the same figure or building on both coins and notes. Redundancy is viewed as a missed opportunity, since each denomination and each medium can contribute a distinct element to the national iconographic repertoire. Complementarity thus implies differentiation: coins and banknotes should reinforce one another without echoing one another.

Material constraints also shape design logic. Metal favors symmetry, radial balance, and relief forms that can be struck cleanly and remain legible. Paper favors linear engraving, shading, and the integration of anti-counterfeiting technologies. A complementary system respects these constraints, allowing each medium to express what it does best rather than forcing one to imitate the other.

Numismatists also observe that currency systems often distribute national identity across time. Coins tend to preserve long-standing motifs, creating a sense of continuity and tradition. Banknotes, which are redesigned more frequently, often reflect contemporary cultural priorities or evolving historical interpretations. This interplay between permanence and change is itself a form of complementarity: the coinage anchors the system, while the banknotes allow it to adapt.

Finally, there is the matter of visual coherence. Even when coins and banknotes differ in theme, they typically share a stylistic language—through typography, recurring motifs, or consistent aesthetic sensibilities—that signals their belonging to a single monetary system. This coherence is not achieved through uniformity but through resonance: the elements of the system relate to one another without collapsing into sameness.

Taken together, these principles form the conceptual framework through which numismatists analyze the relationship between coin and banknote design. Complementarity emerges not from strict rules but from a balance of symbolism and narrative, simplicity and complexity, tradition and innovation, all mediated by the physical and cultural properties of the two media.

Complementarity in Currency Design: Historical Case Studies and Implications for Future Euro Banknotes and Coins

The history of modern currency design offers a rich set of precedents for understanding how coins and banknotes can be made to function as a coherent symbolic system. Although each nation has approached this task differently, certain patterns recur with striking regularity. These patterns provide a useful analytical framework for considering the future evolution of the euro's visual identity, especially as the European Central Bank periodically revisits the design of its banknotes and as the eurozone continues to refine its coinage.

One of the most instructive historical examples is the British currency system of the twentieth century. For decades, British coins carried the monarch's effigy on the obverse and a series of heraldic or symbolic motifs on the reverse, while banknotes depicted a broader cultural narrative, including historical figures, literary icons, and scientific pioneers. The complementarity was deliberate: coins anchored the system in constitutional continuity, while banknotes expressed the intellectual and cultural breadth of the nation. The two media thus formed a layered representation of British identity, with the coinage embodying stability and the banknotes articulating a more expansive national story. This model demonstrates how a currency can distribute symbolic functions across denominations and materials without redundancy.

A contrasting but equally illuminating case is the United States. American coins have long relied on a stable repertoire of national symbols—Liberty, the eagle, and later the presidents—while banknotes have remained remarkably conservative, retaining the same portraits for over a century. Yet even within this conservatism, a form of complementarity emerges: coins tend to emphasize allegory and abstraction, while banknotes emphasize institutional authority and historical continuity. The two media reinforce one another through stylistic coherence rather than thematic diversity. This example shows that complementarity does not require dramatic thematic differentiation; it can also arise from a shared visual grammar that binds the system together.

Japan offers a third instructive model. Japanese coins are characterized by botanical motifs, geometric clarity, and a restrained aesthetic, while banknotes depict cultural figures, architectural landmarks, and scenes of natural beauty. The result is a currency system in which coins express the timeless and elemental aspects of national identity, while banknotes narrate the achievements and cultural heritage of the nation. The Japanese case illustrates how complementarity can be achieved through a division between symbolic minimalism and narrative richness, each medium playing to its material strengths.

These historical examples provide a foundation for thinking about the future of euro currency design. The euro occupies a unique position: it is not the currency of a single nation but of a political and cultural union composed of many. Its first-generation banknotes adopted an intentionally neutral iconography—bridges, arches, and windows—designed to evoke European architectural styles without referencing specific national monuments. The coins, by contrast, allowed each member state to express its own identity on the national side while sharing a common European reverse. This arrangement created a distinctive form of complementarity: banknotes articulated a pan-European narrative of shared heritage, while coins preserved national specificity within a unified monetary framework.

As the eurozone contemplates future redesigns, the challenge is to maintain this delicate balance while responding to evolving cultural, political, and technological conditions. One historically grounded option would be to deepen the existing division of symbolic labor. Banknotes could continue to represent pan-European themes—perhaps shifting from architectural allegory to cultural, scientific, or ecological motifs that reflect contemporary European values—while coins could retain their role as carriers of national identity. This approach would preserve the original logic of the euro while allowing for thematic renewal.

Another possibility, inspired by the British and Japanese precedents, would be to introduce a more explicit narrative structure to the banknotes. Instead of abstract architectural forms, future euro notes could depict shared European achievements: the development of human rights, scientific breakthroughs, artistic movements, or milestones in democratic governance. Such themes would not privilege any single member state and would resonate with the historical trajectory of Europe as a collective project. The coins, meanwhile, could continue to express national symbols, thereby maintaining the dual identity that has defined the euro from its inception.

A more ambitious option would draw on the American model of stylistic coherence. Rather than emphasizing thematic complementarity, the euro could pursue a unified aesthetic language across both coins and banknotes—perhaps through consistent typographic choices, recurring geometric motifs, or shared color logic—while allowing the specific imagery to vary. This would create a sense of visual unity without requiring strict thematic coordination.

Whichever direction is chosen, the historical record makes one principle clear: successful currency systems achieve complementarity not through rigid rules but through a thoughtful distribution of symbolic functions across media. Coins and banknotes need not mirror one another; indeed, they are most effective when they

articulate different aspects of a shared identity. For the euro, a currency that must simultaneously express unity and diversity, this principle is not merely aesthetic but foundational. The future of euro design will depend on how well it can draw upon these historical lessons to craft a visual language that is both coherent and capacious enough to represent the evolving European project.

Overview of Existing Banknotes and Eurocoinage

Euro banknotes exist in seven denominations: €5, €10, €20, €50, €100, €200, and €500. They are issued by the European Central Bank (ECB) and feature a common design theme emphasizing Europe's architectural heritage, security features, and accessibility. The €5 note depicts classical architecture from the Ancient period, the €10 note Romanesque architecture, the €20 note Gothic architecture, the €50 note Renaissance architecture, the €100 note Baroque and Rococo architecture, the €200 note 19th-century iron and glass architecture, and the €500 note modern 20th-century architecture. Bridges and arches/windows on all notes are intentionally fictional to symbolize openness and cooperation. Notes also include stars and a map of Europe to represent EU unity, as well as security features such as watermarks, holograms, microprinting, color-shifting ink, raised print, security threads, and UV elements. Accessibility features include different sizes for each denomination and tactile marks for the visually impaired. The first series of notes was issued in 2002, while the Europa series (2013–2025) features enhanced security, new holograms, updated portraits, brighter colors, and redesigned tactile and size features.

Euro coins exist in eight denominations: 1 c, 2 c, 5 c, 10 c, 20 c, 50 c, 1 €, and 2 €. Coins have a common reverse side and a national obverse side, allowing each member country to depict its own designs. The 1 c, 2 c, and 5 c coins are made of copper-plated steel and are prone to corrosion. The 10 c, 20 c, and 50 c coins are made of Nordic gold alloy (copper-aluminium-zinc-tin). The 1 € coin is bi-metallic with a nickel-brass center and copper-nickel ring, while the 2 € coin is bi-metallic with a copper-nickel center and nickel-brass ring. The common reverse designs feature a map of Europe and the denomination, with larger maps on the 1 € and 2 € coins. All coins feature 12 stars representing the EU. Each country chooses a national obverse design that may include national symbols, monarchs, famous figures, or historical motifs, subject to EU rules for consistency. Coins have edge inscriptions or patterns, bi-metallic coins include anti-counterfeiting features, and size and weight are scaled to denomination for recognition.

Type	Denomination	Material/Alloy	Design Theme	Special Feature
Banknote	€5 – €500	Cotton fiber paper	Architecture: classical to modern	Security features, tactile marks, Europa series updates
Coin	1c, 2c, 5c	Copper-plated steel	EU map (reverse), national obverse	Prone to corrosion, small size
Coin	10c, 20c, 50c	Nordic gold	EU map (reverse), national obverse	Durable alloy, milled edges (10c)
Coin	1 €	Bi-metallic	EU map, national obverse	Durable, anti-counterfeiting, size and weight distinct
Coin	2 €	Bi-metallic	EU map, national obverse	Edge lettering/ridges, highest value coin

The euro currency system consists of seven banknote denominations (€5 to €500) and eight coin denominations (1 c to 2 €). Banknotes feature fictional architectural motifs representing European history, EU symbols such as stars and maps, advanced security elements, and tactile features for accessibility, with the Europa series enhancing durability and security. Coins have a common reverse showing the EU map and national obverses with country-specific designs. Low-value coins (1–5 c) are copper-plated steel and prone to corrosion, mid-value coins (10–50 c) use durable Nordic gold, and 1 € and 2 € coins are bi-metallic with anti-counterfeiting features. Coin sizes, edges, and weights are scaled for recognition and functionality, ensuring usability across vending machines and circulation systems.

Future Euro Currency Design: Historically Grounded Proposals and Comparative Iconographic Analysis

The euro occupies a singular position in the history of monetary iconography. Unlike national currencies, which can rely on a unified cultural narrative, the euro must articulate a shared identity for a political union composed

of diverse nations, languages, and historical trajectories. This challenge has shaped its design philosophy from the outset. The first-generation banknotes adopted an intentionally non-specific architectural allegory, while the coins balanced a common European reverse with nationally distinctive obverses. As the eurozone contemplates future redesigns, it is instructive to examine how other multinational or supranational currencies have addressed similar challenges, and how the euro might evolve while remaining anchored in its historical logic.

The most relevant comparative case is the currency of the Austro-Hungarian Empire, which, like the euro, had to represent multiple nations within a single monetary system. Its banknotes employed allegorical figures—Justice, Industry, Agriculture—rather than portraits of specific individuals, thereby avoiding the privileging of any one ethnic or cultural group. The coins, however, bore the imperial effigy, creating a symbolic hierarchy in which the banknotes expressed universal virtues while the coins embodied political authority. Although the euro lacks a central sovereign figure, the structural logic is similar: the banknotes articulate pan-European themes, while the coins allow for national expression. This historical precedent suggests that the euro's dual structure is not merely a pragmatic compromise but a coherent symbolic strategy with deep roots in the history of multinational monetary systems.

Another instructive comparison is the East African shilling, used across Kenya, Uganda, Tanganyika, and Zanzibar during the mid-twentieth century. Its designers faced the challenge of creating a currency that would be accepted across culturally diverse territories. They adopted a strategy of thematic neutrality: coins depicted local fauna, while banknotes featured abstract geometric patterns and non-specific landscapes. This approach parallels the euro's early architectural motifs, which were chosen precisely because they could evoke European heritage without referencing specific national monuments. The East African example demonstrates that thematic neutrality can function effectively in a multi-territorial currency, but it also reveals its limitations: over time, the currency came to be seen as lacking cultural depth, and successor states quickly replaced it with more explicitly national designs. This historical trajectory suggests that the euro, if it remains too abstract, risks appearing culturally thin or emotionally distant.

A third comparative case is the CFA franc, used across multiple West and Central African nations. Its banknotes depict shared regional themes—agriculture, education, industry—while avoiding specific national symbols. The coins, however, maintain a consistent pan-regional identity. This inversion of the euro's structure—regional unity on coins, thematic diversity on notes—demonstrates that complementarity can be achieved through different distributions of symbolic content. The CFA franc's success in maintaining legitimacy across diverse nations suggests that a currency can sustain a shared identity even without national differentiation on the coinage. For the euro, this raises the possibility of rethinking the balance between national and European elements, perhaps by introducing more explicitly European motifs on coins while allowing banknotes to explore broader cultural narratives.

Drawing on these historical precedents, one can imagine several plausible trajectories for the future euro series. A historically grounded approach would preserve the euro's foundational principle of balancing unity and diversity, but would enrich its symbolic vocabulary. The banknotes could move beyond architectural allegory toward a narrative of shared European achievements: the development of human rights, the scientific revolution, the evolution of democratic institutions, or the artistic movements that have shaped European culture. Such themes would avoid privileging individual nations while offering a deeper and more resonant cultural narrative than the current abstract designs.

The coins, meanwhile, could retain their national obverses but adopt a more unified European reverse that evolves over time. Instead of the static map motif, the reverse could depict rotating themes that reflect the ongoing European project: ecological stewardship, technological innovation, or cultural heritage. This would preserve national identity while strengthening the sense of a shared European future. Alternatively, the euro could adopt a more integrated aesthetic language across both media—through typography, color logic, or recurring geometric motifs—while allowing the imagery itself to remain differentiated. This approach, inspired by the stylistic coherence of the United States currency system, would create unity without imposing thematic uniformity.

Ultimately, the future of euro design will depend on how effectively it can draw upon historical lessons from other multinational currencies while responding to contemporary European realities. The euro must remain

legible as a symbol of unity, yet flexible enough to accommodate the cultural diversity of its member states. The historical record shows that successful multinational currencies achieve this balance not through rigid iconographic rules but through a thoughtful distribution of symbolic functions across coins and banknotes. If the euro can continue to refine this distribution—deepening its cultural narrative while preserving its structural logic—it may become not only a functional medium of exchange but a compelling visual expression of the European project itself.

Summary

At the changeover, governance could notably be strengthened in terms of **institutional coordination, regulatory oversight, and strategic alignment**. This would include ensuring clear delineation of responsibilities among national central banks, the European Central Bank, and relevant fiscal authorities to prevent gaps or overlaps in decision-making. In relation to **policy consistency**, harmonizing rules on currency issuance, anti-counterfeiting standards, and material specifications for coins and banknotes would reduce operational friction and enhance trust across member states. In terms of **financial integration**, improving interoperability of payment systems, standardizing accounting and reporting practices, and reinforcing monitoring mechanisms would allow the euro to function more efficiently as a shared currency while supporting deeper financial union objectives. Strengthened governance in these areas would not only facilitate the technical changeover but also enhance the credibility, stability, and resilience of the currency system as a whole.

Strategic Designation of Eurozone Mints for Coin Production

Euro banknotes today are **not printed in a single central location** but by a **network of accredited high-security printing works across the euro area**, coordinated under the oversight of the European Central Bank (ECB) and the Eurosystem of national central banks. The ECB *authorises* the issue of banknotes and centrally forecasts demand, but in practice the printing and physical issuance are carried out by the national central banks (NCBs) and specialized security printers according to an allocation key. ([European Central Bank](#))

Under this arrangement, production volumes for different denominations are assigned to specific printing works based on demand estimates from the NCBs and a central forecast by the ECB. These works must be **high-security accredited** by the ECB, and they collaborate in a pooled system to ensure quality and uniformity across all euro banknotes regardless of where they are printed. ([European Central Bank](#))

The **ECB authorises overall production and standards**, but the **actual printing is done by the national central banks or contracted security printers in different countries**. Each printing facility has high security and quality systems to ensure uniform quality and anti-counterfeiting standards across all euro notes. [European Central Bank](#)

- **Austria:** Österreichische Banknoten- und Sicherheitsdruck GmbH, Vienna
- **Belgium:** Nationale Bank van België / Banque Nationale de Belgique, Brussels
- **Finland:** Setec Oy, Vantaa
- **France:** Banque de France printing works (Chamalières) and Oberthur Fiduciaire (Chantepie)
- **Germany:** Bundesdruckerei GmbH (Berlin) and Giesecke & Devrient (Munich and Leipzig)
- **Greece:** Bank of Greece printing works, Athens
- **Ireland:** Central Bank of Ireland (Currency Centre), Dublin
- **Italy:** Banca d'Italia printing facilities
- **Netherlands:** Royal Joh. Enschedé (security printer)
- **Spain and Portugal:** Printers authorised by their national central banks

- **Other security printers:** De La Rue and Oberthur Fiduciaire in various authorised locations can also produce euro banknotes under contract. [Bundesbank+1](#)

The **first letter of a euro note’s serial number** actually indicates the printing works, not necessarily the issuing country — for example, notes starting with “X” or “W” come from Giesecke & Devrient facilities in Germany, “R” from Bundesdruckerei in Berlin, “U” from Banque de France, and so on.

The printing network includes (but is not limited to) facilities run by national central banks and private printers such as the Nationale Bank van België/Banque Nationale de Belgique (Belgium), Bank of Greece (Greece), Banque de France (France), Banca d’Italia (Italy), Bundesdruckerei GmbH and Giesecke & Devrient GmbH (Germany), Joh. Enschede Security Printing BV (Netherlands), Oesterreichische Banknoten und Sicherheitsdruck GmbH (Austria), Polska Wytwórnia Papierów Wartościowych (Poland), and others commissioned by euro-area central banks. Each printer is represented by a letter code that appears at the beginning of the banknote’s serial number. ([European Central Bank](#))

11 to 14 high-security printing works currently contribute to euro banknote production, supplying notes for circulation and replacement across the entire euro area. Once printed, notes are distributed by the respective NCBs through commercial banks and cash logistics networks and may circulate widely across euro-area countries due to tourism, travel, and cross-border economic activity. ([European Central Bank](#))

In summary, euro banknotes are produced *throughout the eurozone in multiple, accredited printing works* under a coordinated system managed by the ECB and national central banks, ensuring a uniform standard of security and material quality wherever they are printed. ([European Central Bank](#))

The optimal configuration of Eurozone coin production necessitates a deliberate, multi-criteria approach that balances technological capacity, geographic coverage, political legitimacy, and scalability. The designation of five primary mints is proposed, underpinned by both operational efficiency and strategic redundancy.

Selection Criteria

The selection of mints is predicated upon the following principles:

1. **Production Capacity and Scalability:** Each mint must possess a base production capability sufficient to meet standard circulation requirements, with capacity to increase output in response to demand fluctuations or contingencies.
2. **Technological Sophistication:** Facilities should be equipped with state-of-the-art minting presses and anti-counterfeiting technologies, capable of producing multi-metallic and high-security coinage.
3. **Geographic Distribution:** Mints should be dispersed across the Eurozone to mitigate risk arising from natural disasters, infrastructural disruptions, or political contingencies, ensuring continuity of supply.
4. **Redundancy and Continuity:** The network must provide overlapping production capabilities, enabling one mint to partially substitute for another in case of operational interruption.
5. **Political and Economic Representation:** Distribution should reflect major Eurozone economies to ensure shared ownership, legitimacy, and regional integration.

Proposed Mint Designations

Mint	Location	Justification	Base Production & Scalability
Monnaie de Paris	Paris, France	Largest historical mint; advanced technological infrastructure; political and symbolic significance.	1.2 billion coins/year; scalable +30%
Münze Österreich	Vienna, Austria	Renowned for precision minting; central location for Eastern European distribution.	800 million coins/year; scalable +25%
Istituto Poligrafico e	Rome, Italy	Flexible production lines; experience in multiple denominations.	600 million coins/year; scalable +20–25%

Zecca dello Stato			
Koninklijke Nederlandse Munt (KNM)	Utrecht, Netherlands	Highly automated processes; strategic positioning for Northern and Western Europe.	700 million coins/year; scalable +25–30%
Fábrica Nacional de Moneda y Timbre-Real Casa de la Moneda (FNMT-RCM)	Madrid, Spain	Substantial production capacity; robust security protocols; Southern Europe coverage.	900 million coins/year; scalable +20–25%

Scalability and Operational Considerations

- Modular Production Lines:** Implementation of modular and flexible minting lines is essential to accommodate multiple denominations and rapid production adjustments.
- Inter-Mint Coordination:** Establishment of a real-time monitoring and allocation system across all mints will facilitate adaptive production distribution in response to regional demand or emergencies.
- Contingency Capacity:** Each mint should maintain emergency protocols, including backup lines and potential subcontracting arrangements, to ensure continuity in the event of operational disruptions.
- Logistical Integration:** Decentralized storage facilities proximate to major transport hubs, combined with multi-modal distribution networks, will ensure efficient circulation throughout the Eurozone.
- Technological Modernization:** Continuous investment in minting presses, automation, and digital traceability systems will enhance efficiency, security, and operational responsiveness.

Strategic Redundancy Model

The proposed mint network forms a spatially distributed and operationally redundant system:

[Netherlands]

|

[France region]

|

[Austria] ---- [Italy] ---- [Spain]

- **Northern Europe:** Netherlands
- **Western Europe:** France
- **Central/Eastern Europe:** Austria
- **Southern Europe:** Italy and Spain

This configuration ensures overlapping production corridors, enabling resilient coin supply even under adverse conditions.

Ten-Year Eurozone Coin Production Projection (2026–2035)

Objectives

The projection aims to ensure:

1. Adequate and stable coin circulation across the Eurozone.
2. Scalable production to accommodate demand surges or contingencies.
3. Technological modernization of minting facilities to enhance efficiency, security, and resilience.
4. Redundant operational capacity distributed across multiple Eurozone regions.

Production Forecast per Mint

Mint	Base Annual Production	Planned Annual Increase	Target 2035 Capacity	Notes on Modernization & Scaling
Monnaie de Paris	1.2B	+2%/year	~1.46B	Installation of next-generation presses by 2028; modular lines for emergency surges; AI-based quality control.
Münze Österreich	800M	+2.5%/year	~1.02B	Expansion of production floor by 2027; automated packaging & distribution systems; enhanced multi-denomination capabilities.
IPZS Rome	600M	+3%/year	~808M	New high-security minting presses by 2029; flexible denomination production; integrated stock management system.
KNM Utrecht	700M	+2%/year	~854M	Automation upgrades completed by 2027; digital traceability and predictive maintenance systems.
FNMT-RCM Madrid	900M	+2%/year	~1.1B	Incremental expansion of presses; advanced anti-counterfeiting features by 2030; logistics optimization for Southern Europe.

Production

The aggregate capacity of Eurozone coin production is projected to grow steadily over the coming decade. In 2026, total output is estimated at approximately 4.2 billion coins per year, with projections suggesting an increase to around 5.24 billion coins annually by 2035. This growth trajectory is designed to meet routine circulation requirements while also accommodating unexpected surges in demand, without creating an over-reliance on any single minting facility.

Contingency and redundancy planning are central to ensuring operational resilience across the network of Eurozone mints. Each facility maintains at least one additional production line capable of supplying a substantial portion of other mints' output during emergencies. Strategic stockpiles equivalent to six to twelve months of national circulation for major denominations provide further insurance against disruption. In parallel, digital coordination between mints allows for dynamic allocation of production, enabling rapid redistribution of output to regions experiencing sudden increases in coin demand.

A critical aspect of operational quality and long-term cost-efficiency is the durability of coinage before withdrawal from circulation. Currently, one-, two-, and five-eurocent coins fail to meet satisfactory longevity standards, which is not only operationally inefficient but also a testimony to shortcomings in material selection, design, and quality control processes. Achieving optimal durability requires a rigorous approach to alloy composition, wear resistance, and minting precision. Comparative studies from other major currencies

demonstrate that using corrosion-resistant metals, multi-layered plating, and embossed designs with controlled relief can significantly extend circulation life. Enhanced durability reduces the frequency of replacement, lowers production costs, and maintains public trust in the Euro as a reliable and robust currency. Integrating these considerations into both design and production processes will be essential for aligning operational performance with strategic expectations.

Failure to deliver coinage that meets these basic durability standards carries substantial reputational costs for the Eurozone and the European Central Bank (ECB). Public perception of the Euro as a stable and reliable currency can be undermined when coins wear out prematurely, fostering frustration among businesses and citizens alike. Such deficiencies can be interpreted as a breach of the ECB's assurances regarding the quality and integrity of the currency, potentially eroding trust in monetary governance and diminishing the perceived credibility of Eurozone institutions. Over time, these reputational damages can complicate policy communication, weaken confidence in broader ECB initiatives, and even create political pressure for costly remediation measures. Ensuring that all denominations achieve optimal durability is therefore critical not only for operational and economic reasons but also for preserving the Euro's symbolic and institutional legitimacy.

Modernization and technological advancement form a central pillar of the Eurozone's minting strategy. Between 2026 and 2028, facilities such as Monnaie de Paris, the Royal Norwegian Mint, and Münze Österreich are scheduled to receive next-generation presses, modular lines, and automated production systems. From 2029 to 2031, the IPZS Rome facility will be upgraded to handle high-security multi-denomination minting, while FNMT-RCM implements advanced anti-counterfeiting and logistics systems. By 2032–2035, the integration of AI-based predictive maintenance and full digital traceability across all mints will establish a coordinated production monitoring network, ensuring efficient, secure, and reliable operations throughout the Eurozone.

These measures carry significant strategic implications. Geographic diversification of minting capacity guarantees continuity in the face of regional disruptions, while continuous modernization strengthens operational efficiency and anti-counterfeiting capabilities. Ensuring the durability of all denominations reinforces both cost-effectiveness and public confidence in the Euro. Representation of major Eurozone economies within the mint network enhances political legitimacy and the perception of fairness and shared ownership. Finally, modular production capabilities and inter-mint coordination allow the system to scale rapidly, responding effectively to sudden increases in coin demand and securing the resilience and integrity of the Eurozone's currency infrastructure.

Denomination	Current Material	Average Circulation Life	Key Issues	Suggested Improvements	Expected Benefits
1 cent	Copper-plated steel	2–3 years	Rapid wear, corrosion	Switch to higher-quality copper-zinc alloy or coated steel; optimize embossing depth	Extended life to 5–7 years, lower replacement costs
2 cents	Copper-plated steel	3–4 years	Edge deformation, corrosion	Harder alloy core, improved plating; precision minting	Longer circulation, reduced stockpile depletion
5 cents	Copper-plated steel	4–5 years	Surface wear, fading relief	Multi-layer plating, controlled relief; consider corrosion-resistant alloys	Increased durability, lower production frequency
10–50 cents	Nordic gold (copper-aluminium-zinc-tin)	12–15 years	Minor surface scratching	Maintain current materials, optimize embossing	High durability maintained
1–2 euro	Bi-metallic (nickel-brass + cupronickel)	15–20 years	Minor edge wear	Continuous quality control; digital traceability for defects	Maximized lifespan, high public confidence

Implications for policy-makers

For policy makers, the current state of Euro coinage highlights several critical considerations regarding material selection, circulation longevity, and operational planning. The one-, two-, and five-eurocent coins, primarily composed of copper-plated steel, exhibit relatively short circulation lives of two to five years due to rapid wear, corrosion, and surface degradation. This undermines cost-efficiency and places pressure on production facilities to maintain adequate supply. Addressing these issues requires targeted improvements, such as the adoption of higher-quality alloys, multi-layer plating, and optimized embossing, which could extend the life of these coins to five to seven years while reducing the frequency of replacement and easing stockpile demands.

Higher-denomination coins, including ten- to fifty-cent pieces made from Nordic gold and one- and two-euro bi-metallic coins, already demonstrate substantial durability, with circulation lifespans ranging from twelve to twenty years. Nevertheless, maintaining continuous quality control and implementing digital traceability systems remain essential to ensure defects are minimized and public confidence is preserved.

For policy makers, the implications are twofold. First, decisions regarding material upgrades and technological investments directly affect both operational costs and the sustainability of the Euro coin supply. Second, the durability of coinage carries significant reputational weight: citizens and businesses expect the ECB to deliver coins that meet the durability and quality standards it communicates. Failure to do so can be interpreted as misleading or as “false advertising,” eroding trust in the Euro and in monetary governance more broadly. Policy interventions, therefore, should prioritize both the technical modernization of minting processes and the strategic alignment of coinage quality with public expectations, ensuring that the Euro remains both operationally robust and institutionally credible.

As anecdotal evidence I recall during a travel to the Middle East a rather telling moment while traveling with my mistress. We were engaged in a spirited argument, her being assertive and dogmatic in her positions. To settle the matter, I asked, “Do you want to bet I am right?” She agreed, offering “all the money in your wallet”.

Today, examining the coins in my wallet brought the argument to a quiet but decisive end. The visible wear and tear on every piece, even the bimetallic one-euro coin, makes it clear that my point is correct: Euro coins, despite institutional assurances of durability, do experience noticeable degradation in everyday use. The argument ended not with words, but with evidence in hand—an illustration that practical experience often speaks louder than assertions or formal promises.

The broader lesson is relevant beyond personal disputes. For policy makers and central banks, it reinforces the need to ensure that production standards, materials, and quality controls deliver the durability and reliability that the public expects. Failure to do so risks not only operational inefficiency but also subtle reputational damage, as citizens’ lived experiences may diverge from institutional claims.

SUMMARY

Achieving optimal durability requires careful attention not only to alloy composition but also to minting precision and surface treatment. Small-denomination coins, particularly the one-, two-, and five-eurocent pieces, currently exhibit rapid wear and corrosion, limiting their circulation life to as little as two to five years. By adopting higher-quality alloys, multi-layer plating, controlled embossing depth, and corrosion-resistant materials, the lifespan of these coins could be extended to five to seven years or more. Such improvements reduce the frequency of replacement, lower production and stockpile costs, and enhance public confidence in the currency. In contrast, higher-value coins such as 10–50 cents or bi-metallic euros already demonstrate substantial durability, allowing maintenance of current materials and designs while focusing quality control efforts on minimizing defects and preserving long-term operational efficiency.

Citizens and businesses expect Euro coins to circulate for a reasonable lifespan. When one-, two-, or five-cent coins wear out quickly, this breaks the implicit promise of a reliable and robust currency. From a legal and reputational standpoint, repeatedly issuing substandard coinage can be interpreted as misleading or failing to meet communicated standards, even if not formally actionable. This “false advertising” effect undermines confidence not only in the coins themselves but also in the ECB’s broader capacity to manage monetary stability and uphold the Euro’s credibility. It can create political friction between national governments, central banks,

and the ECB if public complaints escalate, as citizens perceive a failure in delivering what is guaranteed by European monetary institutions

Comparison of bills and coins

Integrated Global Overview of Coin Evaluation, Wear, and Best Practice

When mints, central banks, and numismatists evaluate coins, they typically work across four foundational dimensions. The first is **durability and wear resistance**, which concerns how long a coin's relief, detail, and legibility survive in circulation; this depends on alloy hardness, strike depth, and surface treatments. The second is **aesthetic appeal and design quality**, referring to artistic coherence, recognisability of symbols, clarity of numerals and letters, and the overall timelessness of the visual language. A third dimension is **cost efficiency**, which includes metal costs, striking and coating processes, handling, and the replacement cycle relative to the coin's lifespan. The fourth is **anti-counterfeiting and practical usability**, covering tactile recognisability, machine readability, and resistance to forgery. Secondary considerations include cultural significance, which captures symbolic resonance and national identity, and user friendliness, which relates to size hierarchy, weight distribution, and tactile edge patterns.

Euro coins, especially copper-rich denominations, tend to show wear more quickly than many people expect. Copper alloys oxidise readily, so coins darken and develop patina when exposed to humidity or skin oils. High-circulation denominations such as the 1€ and 2€ experience constant friction in pockets, wallets, and vending machines, which gradually flattens relief and erodes fine detail. Modern minting practices also favour shallower reliefs to reduce production costs, which accelerates the blurring of design elements. For these reasons, many countries refresh their coin designs, alloys, or strike depths roughly every decade.

Within Europe, several mints are widely regarded as benchmarks. Finland and the Nordic countries are known for minimalist, corrosion-resistant designs that age gracefully. Germany produces high-relief €2 coins with excellent bi-metallic engineering and long-lasting legibility. The Netherlands is recognised for anti-oxidation coatings, clear iconography, and strong tactile logic. Austria is praised for elegant designs and careful alloy selection. Switzerland, though outside the euro area, is frequently cited in minting literature for exceptional longevity and clarity.

Beyond Europe, a number of global leaders further expand the definition of best practice. Canada's Royal Canadian Mint is considered one of the most technologically advanced in the world, pioneering multi-ply plated steel that dramatically increases durability while reducing metal cost. Japan's coins are renowned for their exceptional longevity and precision; the iconic 5-yen and 50-yen coins with central holes exemplify functional design that improves tactile recognition and reduces material use without compromising durability.

Global Coin Quality Index:

Euro vs. Top Coin Nations

Region / Currency	Durability & Wear	Aesthetic & Design	Cost Efficiency	Anti-Corrosion / Oxidation
 Euro (Eurozone)	★★★★★	★★★★	★★★★★	★★★
 Finland (Euro)	★★★★★	★★★★★	★★★★	★★★★★
 Switzerland (Swiss Franc)	★★★★★	★★★★★	★★★★★	★★★★★
 Canada (Canadian Dollar)	★★★★★	★★★★★	★★★★★	★★★★★
 Japan (Japanese Yen)	★★★★★	★★★★★	★★★★★	★★★★★

Legend: ★★★★★ = Excellent · ★★★★ = Good · ★★★ = Average · ★★ = Fair · ★ = Poor



South Korea's coinage is admired for its clean modern design, stable copper-nickel alloys, and high compatibility with dense vending and transit machine ecosystems. Australia excels in both durability and aesthetic quality, using robust alloys that withstand extreme temperatures and environmental exposure while maintaining clear, culturally resonant designs. New Zealand's 2006 coin reform is often cited as a model of cost-efficient modernisation, shifting to lighter plated-steel coins that improved durability and reduced production costs. The United Kingdom's Royal Mint has long been a global reference point for high-relief engraving, alloy stability, and anti-counterfeiting innovation, with the bi-metallic £2 coin considered one of the most secure and durable circulation coins ever produced. Singapore's 2013 series demonstrates how corrosion-resistant alloys, crisp design, and enhanced security features can be optimised for a tropical climate.

Across these global leaders, several shared principles emerge. They prioritise alloys that resist corrosion and maintain relief clarity over long circulation periods. Their design languages tend toward simplicity, recognisability, and cultural coherence, avoiding overly intricate motifs that degrade quickly. They invest heavily in anti-counterfeiting technology, often embedding machine-readable features directly into the metal. And they treat coinage as a long-term industrial asset, optimising cost per year of circulation rather than cost per unit.

Euro coins wear faster than many national currencies because of their alloy composition, shallow reliefs, and high circulation intensity. This is normal and expected. The most effective improvements for future euro coin refreshes would involve harder and more corrosion-resistant alloys, deeper reliefs for high-circulation denominations, simplified designs that age gracefully, and enhanced tactile edge features. These approaches align with the best practices demonstrated not only by Finland, Germany, the Netherlands, Austria, and Switzerland, but also by global leaders such as Canada, Japan, South Korea, Australia, New Zealand, the United Kingdom, and Singapore.

Bills We Like



The image shows a Japanese **5000 yen banknote** featuring a portrait of **Ichiyo Higuchi**, a celebrated Meiji-era writer known for her poignant depictions of women's lives in late 19th-century Japan. Her likeness appears on the right side of the note, rendered in soft grayscale tones with delicate detailing.

Half our population are women, too.



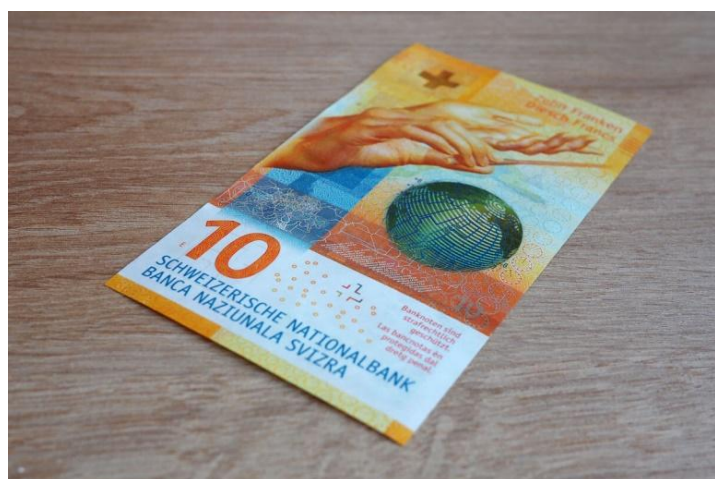
Syria's five-pound banknote from 1993 features ancient figures believed to represent deities or ceremonial officials from the region's rich Mesopotamian and Levantine heritage. These motifs reflect a broader tradition

in Syrian currency design that once celebrated archaeological and cultural symbols before recent reforms shifted toward abstract and nature-based imagery. mythological significance.

To the right, a **sculpted head**—likely representing a deity or prominent figure from ancient Syrian civilization—emerges from a textured background, reinforcing the note’s archaeological and cultural symbolism. The left side contains an **oval blank space**, typically reserved for watermark or other security features. The note’s palette leans toward **earthy tones**, with fine detailing and layered ornamentation that reflect Syria’s rich artistic traditions. It serves not only as currency but as a visual homage to the region’s ancient legacy.



Fauna cannot stand alone, yet here it does with the flipside of person.



This banknote is a 10 Swiss Franc note from Switzerland’s new banknote series. It is characterized by a vivid chromatic range dominated by orange, yellow, and blue, and it is thematically oriented around the concept of organizational talent. At the center of the composition, a pair of hands engages with a geometric globe, an image that conveys Switzerland’s longstanding association with global coordination, diplomatic engagement, and technical precision.

The grid structure of the globe further suggests ideas of connectivity, spatial ordering, and systemic interrelation. Surrounding this central motif is a series of geometric and abstract patterns that reinforce the overarching emphasis on structure, planning, and conceptual clarity, aligning the visual language of the note with the thematic values it seeks to express. I like the idea of depicting enlarged man using his hands to finger decorated playing ball on one side, and on the other side a scientific depiction. The swiss has gotten something right, on.

Can you do it better Trio-in-Unum?



The Brazilian real is conceived as a symbolic bridge between nationhood, nature, and historical continuity. Its banknotes prominently feature allegorical representations of the Republic alongside endemic fauna—such as the jaguar, macaw, and sea turtle—thereby embedding biodiversity at the core of monetary symbolism. This design strategy links economic value to ecological wealth, presenting Brazil as both a modern state and a custodian of one of the world’s most extensive natural endowments. At the same time, the aesthetic language of the real reflects post-hyperinflation stabilization and institutional renewal, using currency design to signal credibility, unity, and permanence within a federal and culturally diverse polity.



Fiji’s money series are characterised by a deliberate synthesis of post-colonial statehood, indigenous heritage, and ecological symbolism. The banknotes and coins move beyond the earlier colonial focus on imperial portraits to foreground national icons, traditional motifs, and representations of Fiji’s marine and terrestrial biodiversity. Indigenous designs, vernacular architecture, and ceremonial objects are integrated with modern security features, producing a currency that narrates sovereignty while affirming cultural continuity. At the same time, the prominence of oceanic imagery and island landscapes situates Fiji firmly within the wider Pacific world,

presenting money as a medium through which national identity, environmental awareness, and geopolitical positioning are jointly articulated.

New Zealand is a young nation situated on an ancient continental fragment, a duality that is subtly inscribed in the design and symbolism of its banknotes. The country's bills juxtapose modern statehood with deep geological time and longstanding indigenous presence, combining portraits of twentieth-century figures with motifs drawn from endemic flora, fauna, and Māori culture. Through this visual language, the notes articulate a narrative of continuity rather than rupture, presenting political modernity as layered upon an older natural and cultural substratum. The material and aesthetic choices of the currency thus serve not merely functional purposes but also operate as instruments of national self-representation, situating New Zealand simultaneously within the global system of modern economies and within the *longue durée* of the Zealandia continent.



Canadian dollars are designed as narrative instruments that intertwine statehood, landscape, and plural memory. The banknote series combines portraits of monarchs and national figures with expansive depictions of Canada's geography, technological achievements, and social institutions, thereby projecting a vision of the country as both historically grounded and forward-looking. Recent polymer notes further emphasize themes of scientific innovation, democratic values, and cultural diversity, while also foregrounding the northern environment as a defining element of national identity. In this way, the Canadian dollar operates not only as a medium of exchange but as a curated statement of continuity, resilience, and territorial vastness within a modern federal state.

Sao Tome



The currency of São Tomé and Príncipe articulates a post-colonial identity shaped by insularity, ecology, and historical marginality within the global economy. The dobra's banknotes and coins foreground tropical landscapes, endemic species, and everyday social life rather than monumental state symbolism, reflecting the country's intimate scale and ecological richness. Visual references to cocoa cultivation, coastal environments, and local fauna situate economic value within the island economy's agrarian and maritime foundations. In doing so, the dobra functions less as an assertion of power than as a medium of recognition, embedding sovereignty in nature, subsistence, and cultural resilience at the periphery of global monetary systems.

Danish money series with The Sun Chariot from Odsherred on its journey across the sky, evocative of 2500 years old culture with a flipside of modern bridges. Very nice mix of old-new during the first decade of the Euros introduction when Bodil Nyboe Andersen was national bank director.

Norwegian banknotes are crafted to merge national identity, natural heritage, and modern statehood into a coherent visual narrative. The series highlights Norway's landscapes, wildlife, and maritime traditions,

juxtaposed with abstract patterns and contemporary design elements that reflect technological sophistication and societal openness



Portraits are largely absent, emphasizing collective identity over individual representation, while motifs such as the ocean, mountains, and indigenous Sami culture assert the country's ecological and cultural particularity. The Norwegian krone thus functions not only as a medium of economic exchange but also as a curated expression of national values, environmental consciousness, and Norway's historical and geographic distinctiveness.

Singapore dollars² is polymer series depicts everyday life, cultural heritage, and iconic architecture alongside flora and fauna, signaling the city-state's blending of human ingenuity with environmental awareness. Australian dollars features prominent Australians alongside native flora and fauna, these notes combine cultural history, modern achievements, and ecological diversity³. Indigenous art and landmarks are often subtly embedded, creating a layered narrative of human and environmental interconnection.

Across these examples, a common theme emerges: modern currency increasingly treats money as a canvas where ecology, heritage, and civic identity intersect, making the banknote a medium for storytelling rather than solely a tool of transaction.

Design Differentiation in the Euro Currency System: Cultural Heritage, Historical Figures, and Nature

The European Central Bank's (ECB) redesign process for euro banknotes highlights a deliberate institutional distinction between **banknotes as carriers of a unified European narrative** and **coins as vehicles of symbolic plurality**. This distinction becomes particularly evident when examining the treatment of **nature and biodiversity**, including birds, across the euro currency system.

²² <https://www.fxchangerate.com/sgd-currency-images.html>

³ <https://www.rba.gov.au/banknotes/>

Banknotes: Singular Narrative Logic

The ECB has shortlisted two mutually exclusive themes for future euro banknotes—*shared European cultural heritage and historically significant figures* and *Rivers and birds*. Each theme is intended to structure the **entire banknote series**, reflecting the ECB's preference for symbolic coherence and political neutrality in a currency that circulates uniformly across all euro area states. Hybridisation within the banknote series is explicitly avoided, as it could dilute narrative clarity and reintroduce contentious representational choices.

The *shared European cultural heritage and historically significant figures* theme foregrounds human agency, creativity, and historical continuity. By referencing cultural spaces, artistic achievements, and emblematic Europeans, it situates the euro as a reflection of Europe's intellectual and civilisational legacy. However, the approach requires careful attention to equitable representation across regions and historical periods to avoid perceived biases.

Coins: Quantified Pluralism of Nature Motifs

Euro coins operate under a decentralised design logic. While the common side is standardised, national authorities determine the reverse side, resulting in significant thematic diversity. Within this framework, **European nature and birds are already present—but in a limited and clearly bounded way**.

As of 2025, **four euro area countries** incorporate explicit **nature, animal, or bird motifs** in their *standard circulating coin series*:

- **Cyprus** depicts the mouflon (a native wild sheep) on its 1, 2, and 5 cent coins.
- **Finland** features flying swans (its national bird) on the €1 coin and cloudberry and blossoms on the €2 coin.
- **Slovenia** includes a stork on its 1 cent coin.
- **Austria** uses floral motifs (e.g., edelweiss, gentian) on lower-denomination coins.

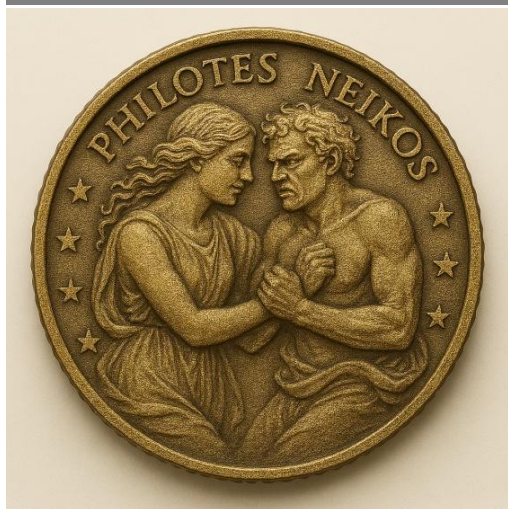
Additionally, **Andorra**, a euro-using microstate outside the EU, depicts animals such as the Pyrenean chamois and a bird of prey on its low-denomination coins. Other euro area members rely predominantly on human figures, heraldic symbols, architectural landmarks, or abstract national emblems. While **commemorative €2 coins** frequently feature biodiversity themes, these issues are episodic and do not form part of the permanent national coin sets used in daily circulation.

Institutional Interpretation

This distribution confirms that **nature and birds are institutionally concentrated in the coin domain**, where symbolic diversity is both expected and politically manageable. Coins accommodate thematic multiplicity across countries and denominations without undermining the integrity of the currency. Banknotes, by contrast, are designed to express a single, legible European narrative at the level of the euro area.

From this perspective, the ECB's proposal to adopt *Rivers and birds* as a comprehensive banknote theme would not merely continue existing practices but would **elevate nature from a nationally differentiated coin motif to a primary pan-European symbol**. Conversely, retaining *shared European cultural heritage and historically significant figures* on banknotes while leaving nature motifs on coins aligns with the existing functional and symbolic division of labour within the euro currency system.

Empirically, European nature and birds are present on **a minority of euro coins**, concentrated in a small number of issuing states and predominantly on low denominations. Conceptually, however, coins provide a well-established space for ecological and biodiversity symbolism. The ECB's banknote redesign debate therefore revolves not around the absence of nature in the euro, but rather **whether nature should remain a plural, nationally mediated motif or become a singular, pan-European narrative equivalent to shared cultural heritage and historical figures**.



Main Themes

Culture: Europe as a Living Continuum, Not a Museum

Europe's greatest competitive advantage is its **depth of accumulated culture**—literary, artistic, legal, scientific—layered over centuries and shared across borders. Organising euro bills around culture allows the currency to reflect **continuity without nostalgia**.

Crucially, *culture* avoids the zero-sum logic of national representation. No single country can claim Dante, Cervantes, Bach, Curie, or Kafka exclusively; they are European precisely because they travelled, translated, and transformed across linguistic and political frontiers. A cultural pillar affirms Europe as a **space of transmission**, not possession.

In policy terms, this aligns with your broader interest in **reimagining Europe beyond administrative or core-periphery models**. Culture on euro bills would visually encode the idea that Europe's cohesion derives from shared intellectual ecosystems rather than territorial dominance.

Personality: Europe as a Community of Individuals, Not Anonymous Systems

Europe is often criticised—internally and externally—for institutional abstraction. By foregrounding **personality**, euro bills would re-anchor the Union in **human agency**.

Unlike leaders or rulers, personalities need not be political. Thinkers, scientists, writers, explorers, humanitarians, even dissidents represent **plural pathways of European contribution**. Personality introduces *biography* into Europe's self-image: lived lives, ethical choices, curiosity, courage, dissent.

This matters in a moment of democratic fatigue. Citizens are more likely to identify with **persons who struggled, erred, or imagined**, than with treaties or buildings. Personality restores **narrative legitimacy** to the European project—an approach that resonates with your recurring emphasis on **democratic ownership and transparency** in EU governance.

Importantly, rotating or thematically grouped personalities avoids canonisation and allows for gender balance, regional diversity, and evolving values over time.

Nature: Europe as a Biogeographical Reality, Not Just a Market

Nature grounds Europe in **physical reality**—its rivers, mountains, seas, forests, winds. This is not decorative environmentalism; it is strategic symbolism.

Europe's geography precedes its states and will outlast them. Rivers like the Danube, Rhine, Vistula, and Po are not borders but **connectors**, shaping trade, settlement, and imagination alike. You have already explored Europe *through its rivers* as an alternative conceptual map; euro bills can make this vision tangible.

Nature also signals Europe's **civilisational commitment to stewardship** in an era of climate stress. It frames the euro as a currency of a continent that understands ecological limits, interdependence, and long temporal horizons—values increasingly central to Europe's global identity.

Unlike monuments, landscapes do not privilege capitals or cores. They decentralise Europe visually and philosophically.

Why This Triptych Works—Together

Separately, culture, personality, and nature are powerful. Together, they form a **balanced European ontology**:

- **Culture** answers *where we come from*
- **Personality** answers *who we are*
- **Nature** answers *where we live and what sustains us*

This triptych avoids nationalism, resists bureaucratic abstraction, and remains future-proof. It allows for rotation, reinterpretation, and educational layering (including digital extensions via QR codes or ECB platforms), turning euro bills into **quiet teachers of European belonging**.

Surely, this may also encompass the EU-flag, buildings, or political figures, expressing Europe as a **shared civilisation of places, people, and meanings**—precisely the kind of Europe Our work consistently argues should be made visible, legible, and emotionally intelligible.

For special features, see the section on security.

Design

Design plays a central role in both banknote and coin production, functioning at the intersection of aesthetics, security, material engineering, and cultural representation. Beyond its decorative function, design serves as a **strategic tool for identity formation**, conveying national and supranational symbols, narratives, and values to the public. In the Euro context, design unites technical innovation with symbolic communication: motifs, imagery, and inscriptions signal European cohesion while allowing subtle expressions of national heritage on individual coins.

In practical terms, design guides the **technical processes of minting and printing**. For banknotes, intricate patterns, microprinting, latent images, and optically variable features are embedded within the layout to prevent counterfeiting while maintaining visual clarity and usability. The choice of substrate, whether cotton, polymer, or hybrid, influences how design elements interact with light, wear, and security features, making design both a functional and symbolic decision. Similarly, in coin minting, the combination of relief, edge engraving, alloy composition, and bimetallic structures is carefully orchestrated to produce a durable, recognizable, and secure product.

From a cultural and social perspective, design communicates meaning beyond mere denomination. Iconography, architecture, historical figures, and abstract motifs act as carriers of collective memory and identity, embedding **emotional and symbolic value** into everyday interactions with currency (Ahmed, 2004; Graeber, 2011). Design choices influence public perception of legitimacy, trustworthiness, and continuity, bridging technical innovation with human experience.

Moreover, design increasingly incorporates **sustainability and material considerations**. Decisions about ink types, substrates, and finishes are informed not only by durability and security but also by environmental impact, reflecting a growing convergence between ecological responsibility and aesthetic functionality (McMillan, 2020; Rafiei et al., 2023).

Ultimately, the design of banknotes and coins is a **multidimensional practice**, where artistry, technology, security, cultural meaning, and sustainability intersect. It is through thoughtful design that currency achieves its

dual role as a **practical medium of exchange and a symbol of collective identity**, simultaneously communicating authority, innovation, and belonging.

Design is central to banknote and coin production, bridging aesthetics, security, and cultural symbolism. It functions not only as decoration but as a **strategic tool for identity formation**, conveying national and supranational values. In the Euro, design balances European cohesion with subtle national expression.

Technically, design guides printing and minting, embedding microprinting, latent images, holograms, and optically variable features to deter counterfeiting. Substrate choice, whether cotton, polymer, or hybrid, interacts with design to enhance durability and security. Coin design integrates relief, edge engraving, alloy composition, and bimetallic structures to ensure recognition and resilience.

Culturally, design communicates history, memory, and identity through iconography, architecture, and abstract motifs. These elements influence public perception of legitimacy, trust, and emotional connection. Design decisions increasingly consider **sustainability**, including eco-friendly inks, recyclable substrates, and energy-efficient production.

Through design, currency achieves a **dual function**: it serves as a practical medium of exchange while simultaneously embodying collective identity, cultural meaning, and technological innovation. It unites artistry, security, material science, and environmental responsibility in a single tangible artifact.

Next-Generation Euro Coin Design Specification

A next-generation euro coin series should be conceived as a long-term industrial asset rather than a mere monetary instrument. The design philosophy must integrate durability, aesthetic longevity, machine readability, and cultural coherence, drawing on the strongest practices demonstrated across Europe, North America, and the Asia-Pacific region.

The foundation of the redesign should be a shift toward **corrosion-resistant, high-hardness alloys** inspired by Canada's multi-ply plated steel and Japan's exceptionally stable copper-nickel compositions. These alloys would significantly extend circulation life while reducing replacement costs. For high-circulation denominations such as the 1€ and 2€, the relief should be deepened to levels comparable to Germany's €2 coins or the United Kingdom's bi-metallic £2, ensuring that fine details remain legible even after years of friction in wallets and vending machines.

The visual language should move toward **simplified, recognisable, and culturally resonant motifs** that age gracefully. Finland, Japan, and Singapore demonstrate how minimalist iconography can remain crisp under wear while still conveying national identity. A unified European design system could adopt a modular approach: a shared pan-European core motif complemented by subtle national identifiers, ensuring recognisability without overloading the relief.

Machine readability and anti-counterfeiting features should be embedded directly into the metal. Canada's multi-ply plating, the UK's bi-metallic ring-and-core engineering, and Singapore's machine-readable micro-features offer strong models. The euro series should adopt **multi-layered electromagnetic signatures**, tactile edge patterns optimised for visually impaired users, and micro-relief structures that remain detectable even after moderate wear.

The redesign should also consider **tactile hierarchy**, ensuring that each denomination is immediately distinguishable by size, weight, and edge pattern. Japan's holed coins and New Zealand's post-2006 size rationalisation demonstrate how structural differentiation can improve usability while reducing material cost.

Finally, the next-generation euro series should be engineered for **climate resilience**. Coins must withstand humidity, salt exposure, and temperature variation across the continent. Australia and Singapore provide strong models for alloys that remain stable in extreme or tropical conditions.

In sum, a globally informed euro redesign would combine Canadian metallurgical innovation, Japanese functional clarity, German relief engineering, Nordic aesthetic restraint, British anti-counterfeiting

sophistication, and Singaporean machine-readability. The result would be a coin series that is durable, elegant, cost-efficient, and future-proof.

Global Comparative Matrix of Coin-Minting Best Practice

Country / Mint	Durability & Alloys	Aesthetic Longevity	Cost Efficiency	Anti-Counterfeiting & Machine Readability	Notes
Finland / Nordics	Corrosion-resistant alloys; stable ageing	Minimalist, crisp designs	Moderate production cost	Strong tactile logic; reliable vending compatibility	Graceful ageing; design coherence
Germany	High-relief bi-metallic engineering	Long-lasting detail retention	Slightly higher cost	Excellent machine readability	Benchmark for €2 durability
Netherlands	Anti-oxidation coatings	Clear iconography	Efficient production	Strong tactile differentiation	Balanced cost and clarity
Austria	Robust alloys	Elegant, detailed designs	Moderate cost	Stable machine compatibility	High aesthetic score
Switzerland	Exceptional alloy stability	High clarity over decades	Higher cost offset by longevity	Strong anti-counterfeiting	Global reference point
Canada	Multiply plated steel; extremely durable	Clean, modern motifs	Highly cost-efficient	Advanced electromagnetic signatures	Technological world leader
Japan	Ultra-stable copper-nickel alloys	Minimalist, timeless designs	Efficient long-life coins	Holed coins; excellent tactile logic	Exceptional longevity
South Korea	High-quality copper-nickel	Modern, clear designs	Efficient production	Optimised for dense vending ecosystems	Strong industrial integration
Australia	Alloys resilient to extreme climates	Culturally rich yet clear designs	Moderate cost; long lifespan	Stable machine readability	Climate-resilient benchmark
New Zealand	Durable plated-steel post-2006	Simplified, crisp motifs	Highly cost-efficient redesign	Improved tactile hierarchy	Model for currency reform
United Kingdom	High-relief engraving; stable alloys	Heraldic + modern clarity	Moderate cost; high security	Bi-metallic £2 among world's most secure	Anti-counterfeiting leader
Singapore	Corrosion-resistant tropical alloys	Crisp, modern iconography		Machine-readable micro-features	Tropical-climate excellence

A Complementary Coinage Series: Denomination-Based Design and Thematic Integration

The following schematic presents a **structured framework for a euro coinage series** designed to complement a dual-theme banknote system. It reflects denomination-based differentiation, thematic allocation, and illustrative motif examples, ensuring coherence with a banknote series that may feature both personalities, cultural heritage, and natural elements.

denomination	Primary theme	Compelementary	Illustrative Motif	Design Rationale
1c – 5c	Nature Biodiversity /	Local fauna and flora	Small birds, native flowers, butterflies, mouflon	Low-denomination, high-circulation coins; motifs are simplified to ensure recognisability and pedagogical value.
10c – 20c	Nature Biodiversity (or culture if banknotes emphasize nature)	Regional ecosystems or minor cultural symbols	Forest landscapes, river segments, cultural landmarks	Medium-denomination coins serve as a bridge between nature and culture; designs permit moderate detail.
50c	Nature Biodiversity (or culture)	Iconic species or architecture	Migratory birds, national parks, historic buildings	Medium-to-high denomination coins; higher relief and greater symbolic continuity.
€1	Nature Biodiversity (or culture)	Prominent species or notable historical figures	National bird, iconic European rivers, minor cultural figure	High-denomination coins; detailed motifs that complement banknotes without replication.
€2	Nature Biodiversity (or culture)	Emblematic species or major historical figures	Eagle, stork, endangered species, celebrated European personality, landmark	Highest-denomination coins; convey prestige and reinforce the cumulative narrative of the coin series.

Design Considerations

A foundational principle guiding the design of the Euro coinage system is **complementarity**. Coin motifs are intentionally differentiated from the imagery depicted on banknotes to avoid redundancy and to ensure that each denomination communicates a distinct facet of European heritage and identity. While banknotes predominantly highlight personalities, cultural achievements, and architectural landmarks, coins are envisioned as emphasizing natural, faunal, or environmental motifs. This deliberate distinction allows the combined currency system to present a rich, multidimensional narrative, wherein notes and coins together reflect the full spectrum of Europe’s cultural, historical, and ecological legacy.

Stylistic standardization constitutes a second critical consideration. Uniformity in elements such as edge patterns, relief depth, engraving style, and the placement of stars and rims ensures visual cohesion across denominations, despite the diversity of motifs. Consistent artistic grammar enhances recognizability, allowing users to intuitively associate specific design cues with authenticity and value, while simultaneously reinforcing a coherent aesthetic identity for the entire Euro system.

Minting rationalization represents another essential aspect of the design framework. Lower-denomination coins are intended for high-volume production and therefore require simplified motifs that remain visually effective and economically efficient. Higher-denomination coins, in contrast, are produced in more moderate quantities, permitting the use of more detailed and intricate designs. Centralized coordination across national mints is critical to maintaining consistency in technical specifications, production quality, and stylistic coherence throughout the Euro coinage series.

Finally, the Euro coin series can be conceived as a **sequential narrative**, in which motifs evolve progressively across denominations. For example, a single bird species might appear on the 1 cent coin, its habitat represented on the 10 cent coin, a broader regional ecosystem depicted on the 50 cent coin, and culminating in a pan-European environmental or symbolic representation on the €2 coin. Such a graduated design strategy not only

strengthens the educational value of the currency but also reinforces its symbolic coherence, transforming everyday transactions into subtle engagements with Europe's natural, cultural, and historical heritage.

This academic formulation emphasises **strategic complementarity, thematic coherence, and operational feasibility**, aligning coin designs with a multi-thematic banknote series.

SUMMARY

The European Union can significantly strengthen its coinage system by adopting harder, corrosion-resistant alloys modelled on Canada's multi-ply plated steel and Japan's ultra-stable copper-nickel compositions, thereby extending circulation life and reducing replacement costs. It should deepen relief on high-circulation denominations to match the durability of Germany's €2 coins and the United Kingdom's bi-metallic £2, ensuring that fine details remain legible after years of friction. The EU would benefit from simplifying its visual language, drawing on Nordic and Japanese minimalism to create motifs that age gracefully and remain recognisable under wear. Machine readability should be enhanced through embedded electromagnetic signatures and micro-relief structures inspired by Singapore and Canada, improving both security and vending-machine compatibility. A rationalised tactile hierarchy, informed by Japan's holed coins and New Zealand's post-2006 redesign, would improve accessibility and reduce user error. Climate resilience must be treated as a design requirement, with alloys engineered to withstand humidity, salt exposure, and temperature variation across the continent. Production should shift toward lifecycle-based costing, prioritising long-term durability over short-term savings. The EU should also adopt a modular design architecture that allows future denominations or security upgrades without requiring a full redesign. Finally, the next generation of euro coins should be conceived as a unified industrial system, integrating metallurgy, design, security, and usability into a coherent, future-proof European standard.

Across global currency systems, the highest-performing paper-bill series share a set of structural hallmarks that mirror, but also extend beyond, the logic applied to coins. Time has run out of the neutral bridge-building and many of the national sides not only because we feel more European yet also since the ingredients lead to earlier wear and tear than what we could normally expect from a stable and strong coinage such as the Euro.

The first hallmark is **material innovation**, where leading central banks adopt polymer substrates or hybrid composites that dramatically increase durability, resist tearing, and maintain colour stability. Countries such as Canada, Australia, and the United Kingdom have demonstrated that polymer notes can remain in circulation for years longer than traditional cotton-based bills while retaining crispness and legibility. This shift also enables transparent windows, embedded micro-features, and complex layering that are impossible on paper alone.

A second hallmark is **multi-layered security architecture**, where anti-counterfeiting is treated as a dynamic, evolving system rather than a static set of features. Best-practice banknotes integrate holographic foils, colour-shifting inks, micro-text, raised intaglio printing, and machine-readable elements that operate at different perceptual levels: immediate visual cues for the public, tactile cues for the visually impaired, and deep-layer features detectable only by specialised equipment. The most advanced series, such as those of Switzerland and Singapore, embed security into the substrate itself, making counterfeiting exponentially more difficult.

A third hallmark is **aesthetic coherence paired with functional clarity**. The strongest banknote series balance cultural storytelling with design minimalism, ensuring that motifs remain recognisable even under wear. Switzerland's ninth-series notes, Canada's polymer series, and Norway's pixel-wave designs exemplify how national identity can be expressed through modern, abstract, or symbolic visual languages without compromising usability. Colour differentiation, denomination hierarchy, and tactile markers are treated as integral components of the design system rather than afterthoughts.

A fourth hallmark is **climate and environment resilience**. Polymer and hybrid notes withstand humidity, oils, folding stress, and temperature variation far better than cotton-based bills. This is particularly evident in tropical and high-humidity countries such as Singapore and Malaysia, where polymer notes maintain structural integrity and colour fidelity long after paper notes would have degraded.

A fifth hallmark is **cost-efficiency over the full lifecycle**. While polymer notes may have higher initial production costs, their extended lifespan and reduced replacement frequency make them significantly more

economical over time. Countries that have transitioned to polymer consistently report lower long-term costs and reduced environmental impact due to fewer reprints and less waste.

Finally, best-practice banknote systems exhibit **design modularity and future-proofing**. They are built to accommodate new denominations, updated portraits, or emerging security technologies without requiring a full redesign. This modularity ensures that the series can evolve with technological advances and shifting cultural priorities while maintaining visual continuity.

Taken together, these hallmarks define a global standard for excellence in paper-bill design: durable materials, layered security, aesthetic clarity, climate resilience, lifecycle efficiency, and modular adaptability. When viewed alongside the best practices in coin minting, they reveal a coherent philosophy of currency design in which physical money is treated as a long-term infrastructural asset — engineered for longevity, usability, and cultural resonance across decades of circulation.

Some like a labyrinth as a way of finding home to yourself after having been abroad for a while, others see the depicted as a hedge in an age of insecurity, while other may want to ask: Which garden are you looking for as an intimate question ? The human is a complicated maze, and finding your is not always easy. A labyrinth sometimes help, then.



Cultural Significance

The adoption of a dual-theme model for euro banknotes—either *shared European cultural heritage and historically significant figures* or *nature and biodiversity*—necessitates a structured approach to coinage design to ensure systemic coherence and visual harmony. Coins, as secondary yet pervasive instruments of the currency system, provide a unique opportunity to complement banknote themes while preserving functional and symbolic diversity.

Thematic Partitioning

A fundamental principle is the allocation of **complementary thematic domains** between banknotes and coins. If banknotes foreground cultural heritage and historical figures, coins should predominantly display motifs of **European flora, fauna, and ecosystems**. Conversely, if the banknote series prioritises natural landscapes and biodiversity, coins should highlight **historical figures, cultural symbols, or architectural landmarks**. Such a partition maintains thematic coherence while avoiding redundancy in the public currency narrative.

Denomination-Based Differentiation

Coins can incorporate thematic differentiation according to denomination:

- **Low-denomination coins (1–10 cents):** depict commonly recognisable fauna or flora, reinforcing accessibility and educational value.
- **Medium-denomination coins (20–50 cents):** feature cultural landmarks, minor historical figures, or abstract motifs that bridge natural and cultural symbolism.

- **High-denomination coins (€1–€2):** portray prominent historical personalities, emblematic birds, or iconic natural landscapes, combining aesthetic detail with circulation relevance.

This tiered approach allows for **symbolic progression** across the coinage series, enhancing both recognisability and pedagogical impact.

Visual Standardisation and Stylistic Consistency

To achieve a harmonised appearance, all coins should adhere to standardised **layout, relief depth, edge design, and engraving conventions**. Iconographic elements must be balanced to avoid the predominance of one motif type over the series as a whole. Centralised approval processes, even in the context of a rationalised or multi-mint production system, are essential to preserve **stylistic coherence, quality control, and recognisability**.

Minting Rationalisation

Operational considerations include rationalising mint production according to **denomination demand**, while maintaining thematic and stylistic standards. Lower-denomination coins, produced in high volumes, may employ simplified motifs, whereas high-denomination coins can support greater detail. Material composition and anti-counterfeit requirements must also be integrated into design planning.

Thematic Integration Across the Series

Designs should communicate a **cumulative narrative**, allowing motifs to interact sequentially across denominations. For example, a low-value coin may depict a single species of bird, with higher denominations illustrating broader ecological contexts or cultural integration. Coin designs should **complement, rather than replicate, banknote imagery**, reinforcing the dual-theme currency system's educational and symbolic objectives.

Governance and Oversight

Effective governance requires the establishment of a **centralised currency design advisory body**, responsible for reviewing thematic fidelity, stylistic consistency, and cultural representativeness. Consultation with **numismatic experts, cultural historians, and environmental authorities** ensures that both human and natural motifs are appropriately represented. Iterative prototyping and circulation testing are recommended to validate recognisability and public acceptance prior to mass production.

Rationale

This model preserves the **symbolic integrity of a dual-theme banknote series** while utilising coins to achieve thematic plurality and broader cultural or ecological representation. It balances aesthetic, educational, and operational objectives, providing a framework for a **standardised, complementary coinage system** that is coherent, recognisable, and operationally feasible within a centralised or rationalised minting environment.

From both a political, aesthetic, symbolic and operational point of view, there should be complementarity and standardization of the coinage system, but this is not the model chosen by the ECB, who has opted for a hybrid model on our behalf informed by its cash strategy as balanced by the introduction of a digital euro and given primacy to two bill design options. Either way, an additional choice is to be made over the standardization of the coinage series.

Don't misunderstand me there are many countries who have their paperseries printed and even coins minted outside their central banks and countries. The ECB is well-intentioned since the member staes continue to use themselves and the new European has to be conceived in order to be born. Bills and coin s have a subtle effect on self-perception, yet I opt for a 3:1 approach to the design of the bills and a strandardised approach to the coinage series in a compelemntary mode nonostante. As a metter of fact the 3:1 apporah has hardly been tred out with conviction anywhere, and this an additional reason to pick up the gauntlet.

I want to inaugurate a continental union and a national culture as a son of the soil and use a potent symbol like a bill and coin as a symbolic lever to tell the story of Europe for the use during a daily ritual: paying cash at the counter.

Money and Coins as Symbol, Narrative, and Ritual

Currency, encompassing both banknotes and coins, functions simultaneously as a **symbolic, narrative, and ritual object**, performing multiple sociocultural roles beyond its economic utility.

Symbolic Function

Monetary instruments operate as **visual and material symbols of collective value, authority, and identity**. The imagery on banknotes and coins—ranging from historical personalities and architectural landmarks to fauna and flora—encodes **cultural, political, and ecological significance**. For instance, European coins depicting birds or rivers signify environmental consciousness, whereas portraits of historical figures on banknotes reinforce continuity with shared heritage.

From a semiotic perspective, money serves as a **signifier of social order**, where motifs communicate culturally legible meanings. From a political economy standpoint, currency **materializes sovereignty and institutional authority**, rendering abstract concepts such as “Europe” or “nationhood” tangible and publicly legible.

Narrative Function

Currency also performs a **narrative function**, conveying stories about collective identity, history, and natural heritage. Banknotes and coins together can construct **progressive, multi-layered narratives across denominations**. For example, lower-denomination coins might depict local flora and fauna, medium denominations regional cultural landmarks, and higher denominations continental heritage or iconic species. Banknotes that integrate personalities, culture, and animals support a **pan-European narrative**, which coins reinforce and expand.

Repeated circulation embeds these narratives in everyday experience, **reinscribing cultural memory and societal values**. From a cultural studies perspective, currency acts as a **medium of storytelling**, while memory studies highlight its role in sustaining **collective remembrance and civic consciousness**.

Ritual Function

The use and issuance of currency involve **ritualized social practices**. Everyday transactional acts—paying, exchanging, saving, or collecting coins—constitute repetitive performances that **affirm social trust, legitimacy, and institutional authority**. Commemorative or special-issue coins further introduce ceremonial dimensions, connecting citizens to cultural or state rituals.

Rituals extend to the production process itself. Coin minting, first-strike ceremonies, and public displays of newly issued banknotes constitute **formalized acts that codify authority and symbolically enact collective identity**. Anthropological and sociological analyses frame these practices as **performances of trust and social cohesion**, embedding currency within broader societal rituals.

Integration of Symbol, Narrative, and Ritual

Currency operates through the **interrelation of symbol, narrative, and ritual**. Symbolic motifs encode meaning; these motifs collectively construct narratives of cultural heritage and ecological or historical identity; and their repeated handling and ceremonial introduction enacts ritualized practices.

Design strategies, including the integration of personalities, cultural heritage, and natural motifs, must consider:

1. **Symbolic clarity** – ensuring motifs communicate intended societal values;
2. **Narrative coherence** – structuring motifs to tell a cumulative and intelligible story;
3. **Ritual usability** – accommodating practical circulation, public engagement, and ceremonial contexts.

Currency, comprising both banknotes and coins, functions as more than a medium of economic exchange; it is simultaneously a symbol, a narrative, and a ritual. Banknotes and coins operate as **visual and material symbols** of collective value, authority, and identity. The motifs they bear—historical figures, architectural landmarks, and representations of flora and fauna—encode cultural, political, and ecological significance. For example, coins depicting birds or rivers convey environmental consciousness, whereas portraits on banknotes reinforce historical continuity. Semiotic analysis positions money as a **signifier of social order**, translating abstract societal concepts into tangible forms. From a political economy perspective, currency materializes sovereignty and institutional legitimacy. Beyond symbolism, money constructs **cumulative narratives** about collective identity, history, and natural heritage. Coins and banknotes together can convey progressive stories across denominations, linking local, regional, and continental motifs. Repeated circulation embeds these narratives into everyday experience, reinforcing civic memory and cultural values.

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Thoughtful currency design must balance clarity, coherence, and usability across symbolic, narrative, and ritual dimensions. Multi-thematic motifs—incorporating personalities, culture, and nature—should be **complementary across denominations**, avoiding redundancy while ensuring recognisability. Lower-value coins can emphasize local fauna or flora, mid-value coins regional cultural markers, and higher-value coins prominent species or landmarks. Banknotes may integrate all three themes to form a cohesive pan-European story, while coins extend and reinforce elements of this narrative. Standardization of layout, relief, and engraving style ensures **visual cohesion**, while production rationalization guarantees consistent quality across mints. Sequential narrative logic across denominations strengthens public engagement and educational value.

Currency serves as a **medium of European identity formation**, symbolizing shared values, heritage, and ecological awareness. Banknotes and coins together communicate a **pan-European narrative** that transcends national borders while allowing local or regional expression. This has implications for both cultural policy and monetary governance, providing a tool for soft power and public education. By integrating multiple motifs, currency can **reinforce civic cohesion, environmental consciousness, and historical literacy**, aligning practical design choices with broader European objectives. In this sense, monetary instruments are not neutral economic objects but **cultural artefacts**, performing social, educational, and symbolic functions that extend beyond their material utility.

Summary

Banknotes and coins are not merely instruments of economic exchange. They are **cultural artefacts** that **symbolize collective identity, convey narratives of history and nature, and structure both quotidian and ceremonial practices**. A well-conceived currency series leverages these dimensions to reinforce social cohesion, civic education, and collective memory, illustrating the profound cultural significance embedded in everyday monetary instruments.

Money and coins function simultaneously as symbols, narratives, and ritual objects, embedding cultural, ecological, and historical meaning within the everyday practices of circulation and exchange. Banknotes can incorporate multiple thematic elements, including personalities, cultural heritage, and representations of nature, whereas coins should be designed to complement these motifs without replication, thereby constructing a coherent, multi-layered narrative across the currency system. Differentiation by denomination allows for progressive storytelling, with lower-value coins emphasizing locally significant elements and higher-value coins presenting iconic or pan-European motifs. The standardization of visual features and the rationalization of production processes ensure cohesion and recognisability across the coin series, even when motifs are diverse in theme and style. Thoughtful currency design contributes directly to the formation of European identity, the projection of soft power, and the promotion of civic education, simultaneously reinforcing social trust and collective memory. A deliberately coordinated system of coins and banknotes allows the symbolic, narrative, and ritual functions of currency to operate synergistically, enhancing both its aesthetic and cultural significance. By integrating multi-thematic motifs across denominations, currency achieves educational, symbolic, and practical utility, establishing money as a powerful instrument of cultural communication and societal cohesion.

I am simply not convinced the ECB is serious enough about and doint a good enough job out of the identity formative aspects of the their ware, albeit it may be spot on concerning the stage of European capitalism and that the political center is too weak and perhaps a strong personality may be needed to stamp his authority on the EU Integration Project. At the end of the say we share concerns for Europe and care for it, but have different ways of using design for nation-building. The ECB expresses the universe, I want to discuss it and shape it through the most potent medium of uniting politics and finance, citizen and state: Money.

A compromise could be to do the change over in two tempi: Bills first, second coinage.

Artistic Design

In any mature currency system, artistic design is not an ornamental afterthought but a structural principle that shapes how the banknote series and coin series communicate identity, authority, and cultural meaning. When approached deliberately, artistic design becomes the unifying grammar through which the entire monetary system expresses coherence, even when the thematic content of individual denominations varies widely. For the euro, which must balance supranational unity with national diversity, the introduction of a clearly defined artistic design philosophy is essential for ensuring that future banknotes and coins form a visually and symbolically integrated whole.

Artistic design in banknotes operates on a plane that is both conceptual and material. The printed surface, the watermark, and the holographic band together form a layered artistic field in which imagery, texture, and optical variability interact. The printed design establishes the narrative—whether cultural, historical, or ecological—while the watermark introduces a sculptural, almost meditative dimension that softens and deepens the visual field. The holographic band, with its kinetic and chromatic shifts, adds a dynamic layer that responds to movement and light. When these elements are conceived as parts of a single artistic vocabulary, the banknote

becomes a multidimensional object whose meaning unfolds through user interaction. This is where artistic design transcends illustration: it becomes a choreography of perception.

Coins, by contrast, operate within the constraints of relief sculpture and metallic durability. Their artistic language is defined by the interplay of depth, contour, and tactile presence. A coin's design must be legible at a glance, resistant to wear, and expressive through minimal means. Yet within these constraints, coins can achieve remarkable artistic sophistication. The relief portrait, the national emblem, the geometric motif—each becomes a sculptural statement that carries symbolic weight. When the coin series adopts a consistent artistic style, whether classical, modernist, or abstracted, it creates a visual rhythm that complements the more expansive narrative possibilities of the banknotes.

The challenge for the euro is to define an artistic design philosophy that bridges these two media without forcing them into uniformity. The banknotes, with their layered security features and broad visual surfaces, can sustain a more elaborate artistic narrative, while the coins can embody a distilled, sculptural expression of identity. The key is to ensure that both series share an underlying aesthetic logic—through line quality, proportional systems, typographic choices, or recurring motifs—so that they feel like components of a single artistic project rather than parallel but unrelated artifacts.

Introducing artistic design as a defined dimension also allows the euro to integrate culture, personalities, and nature in a more coherent manner. A portrait rendered in the watermark can echo the sculptural language of a coin's effigy. A cultural motif printed on the note can be mirrored in abstracted form on the common side of the coinage. A natural pattern expressed through the holographic band can resonate with the radial symmetry of a coin's reverse. In this way, artistic design becomes the connective tissue that binds the thematic elements together, ensuring that the currency system communicates not only through symbols but through a shared visual and tactile sensibility.

By elevating artistic design to a central organizing principle, the euro can achieve a level of coherence and expressive depth that matches its political and cultural ambition. The banknotes and coins would no longer be merely functional instruments of exchange but components of a unified artistic statement—one that reflects the complexity, diversity, and shared heritage of Europe in a manner that is both contemporary and enduring.

As the euro evolves, its designers face the challenge of enriching the symbolic vocabulary of the banknotes without compromising the delicate balance between national diversity and supranational unity. One promising direction lies in supplementing the existing design framework with a more deliberate interplay between cultural motifs, historical personalities, and representations of the natural world. These three domains—culture, individuals, and nature—form a triad that has historically anchored the iconography of many successful currencies. For the euro, they offer a way to deepen the narrative content of the notes while maintaining the neutrality required of a multinational currency.

A first approach begins with culture as the primary structuring element. In this model, each denomination would foreground a cultural achievement or tradition that is recognizably European without being tied to a single member state. The personalities associated with these cultural domains—writers, scientists, composers, philosophers—would appear not as national icons but as contributors to a shared European heritage. Nature would then serve as the contextual layer, providing landscapes, flora, or ecological motifs that situate these cultural achievements within the broader physical environment of the continent. This sequence—culture, personalities, nature—creates a narrative in which human creativity emerges from and interacts with the natural world, while the individuals depicted are framed as participants in a collective cultural continuum rather than representatives of specific nations.

A second approach reverses the order by placing personalities at the center. Here, the banknotes would highlight individuals whose contributions transcend national boundaries and whose legacies are woven into the fabric of European identity. These figures would not be chosen for their national symbolism but for their role in shaping shared intellectual, scientific, artistic, or humanitarian traditions. Culture would then function as the interpretive layer, providing the thematic context that explains why these individuals matter: the movements they shaped, the ideas they advanced, the artistic or scientific revolutions they helped ignite. Nature would again serve as the grounding element, offering visual continuity across denominations and reminding users that Europe's cultural and intellectual history is inseparable from its diverse landscapes and ecosystems. This sequence—personalities,

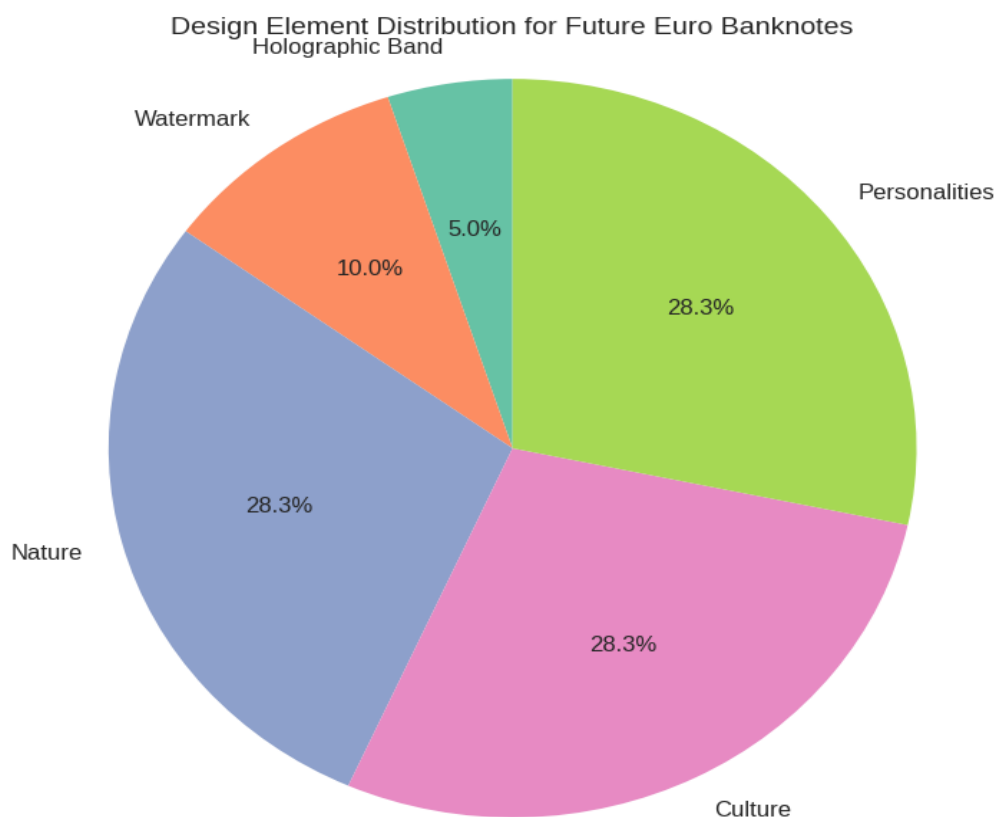
culture, nature—places human agency at the forefront while ensuring that the broader cultural and environmental context remains visible.

Both approaches offer a way to enrich the euro’s symbolic repertoire without falling into the pitfalls of national favoritism or excessive abstraction. They allow for a multidimensional design philosophy in which the banknote becomes not merely a security instrument but a cultural artifact. By weaving together culture, individuals, and nature, the euro can articulate a narrative that is simultaneously historical and forward-looking, rooted in shared heritage yet open to contemporary values such as environmental stewardship, scientific progress, and cultural pluralism.

In practical terms, these frameworks also complement the advanced security features already present in modern banknotes. Watermarks, holographic bands, and optically variable inks can be integrated into the cultural or natural motifs, creating interactive layers that reveal additional symbolic content when the note is tilted or held to the light. This reinforces the multidimensionality of the design, allowing the banknote to unfold its meaning gradually through user interaction. The result is a currency that is not only secure and functional but also intellectually and aesthetically engaging, capable of expressing the richness of the European project in a way that resonates across borders.

By integrating culture, personalities, and nature through the complementary roles of the watermark and holographic band, future euro banknotes can achieve a richer symbolic depth than the current series. They can become objects that not only secure transactions but also express the intellectual, cultural, and ecological heritage of Europe in a way that is subtle, interactive, and resonant. I have a very strong European identity.

And *designo* means idea and project, intention and outline. There is a double-boundedness that then has to be associated with form to become design. A lottizzazione between the elements could be:



In banknote design, a layered meaning emerges when the watermark, holographic band, printed imagery, and tactile elements each carry a different dimension of meaning. The note becomes a kind of modern palimpsest: a layered object whose significance is not exhausted by a single glance, comparable to the old and complex Europe.

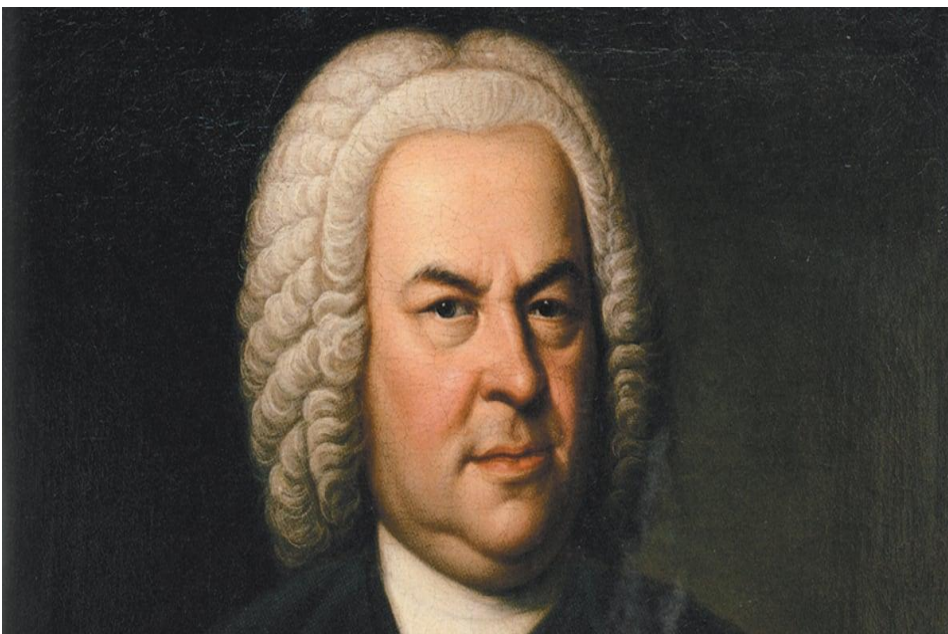
Proposal 1 Loving Pelican couple ready for take-off, A Loire Castle mirrored in moat and Bach tuning in with God



A Pelican couple, ready for take-off.



Loire for renaissance, Narcissus.



Unser Gott ist ein Fester Burg, Bach wrote.

Proposal 2 – Completing the founding fathers vision



The rendering would be of a man planting the EU Flag on a Mountain Top, say, Mont Blanc.

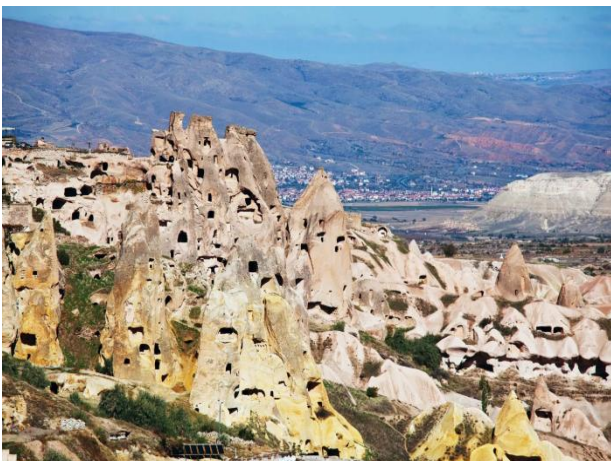


Parliament's seat in Bruxelles.



Jean Monnet, arms and cognac dealer.

Proposal 3 – Europe is a Peninsula, Minor Asia has Christian heritage and Michelangelo was a great artist



Cappadocia's landscape is a surreal fusion of geology and human history—marked by towering fairy chimneys, undulating valleys, and ancient cave dwellings carved into soft volcanic rock. It feels otherworldly, as if sculpted by both nature and myth, and remains one of Turkey's most iconic and evocative regions.



Pažaislis Monastery is a Roman Catholic monastery complex located near Kaunas, Lithuania, on a peninsula by the Kaunas Reservoir, about seven kilometers east of the city center. It was built for the Camaldolese hermits in the Italian Baroque architectural style and includes a church, monastery buildings, courtyards, and surrounding parkland. Historically, it also served as a Russian Orthodox monastery for a period in the 19th century.



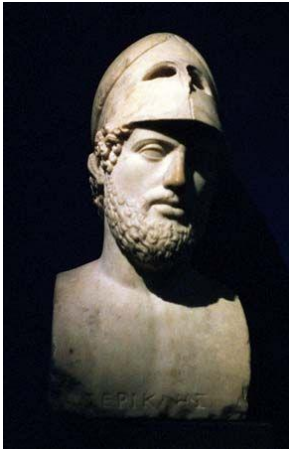
Cicero, Senator, Lawyer, Orator, Statesman. It is the quality of your arguments that counts, still in the EU system, yet as a politician you must be able to appeal to reason, emotions and the wallet.

Quosque tandem abutere, Catalinam, patientia nostrum ?

Proposal 4 Water is the origin of life and a fountain of possibilities, European needs to be bold acombined with a well thought out plan for the unification of the continent.



The **Louis Vuitton Foundation in Paris** epitomizes the **intersection of contemporary art, architectural daring, and cultural prestige**. Designed by Frank Gehry, its sweeping glass “sails” and fluid forms reflect **innovation, transparency, and movement**, transforming traditional museum architecture into a sculptural experience. The Foundation also represents **cultural ambition and global outreach**, positioning Paris as a nexus of modern creativity.



Pericles, Greek Statesman, with Martial Helmet. Pericles (c. 495–429 BCE) was a prominent Athenian statesman, orator, and general during the city’s Golden Age. He played a central role **in** strengthening Athenian democracy, expanding the empire, and fostering a cultural flourishing that included monumental building projects such as the Parthenon. His leadership and vision left a lasting imprint on political theory, art, and the ideal of democratic citizenship.



Winefield along Danube in Austria that Napoleon wanted to destroy. The Wachau Valley vineyards along the Danube—especially near Dürnstein and Krems—were nearly caught in the crossfire of Napoleon’s 1805 and 1809 campaigns, but there is no direct evidence that Napoleon explicitly sought to destroy them. However, the region was deeply affected by troop movements and battles, including the Battle of Dürnstein and later Aspern-Essling.

Proposal 5 – Kafka Alhambra was the last stand of Muslim Europe leading us to the Americas, and Involvement of mother and children and maternal protective instincts a guarantee of renewal.



This black-and-white portrait presents **Franz Kafka**, the enigmatic 20th-century writer whose work continues to shape existential and surrealist literature. Dressed in **formal attire**—a dark suit, white shirt, and striped tie—

Kafka's neatly combed hair and direct gaze evoke a sense of introspective intensity. The **plain background** ensures that all attention remains on his expression: neutral, yet quietly haunted.

Kafka's image mirrors the themes of his writing—**alienation, bureaucratic absurdity, and metaphysical dread**—as seen in *The Trial*, *The Metamorphosis*, and *The Castle*. His austere presentation contrasts with the labyrinthine worlds he created, where identity dissolves and systems overwhelm.

He wrote in Praager Deutsch.



The Moon rising over Alhambra, the majestic palace-fortress complex in **Granada, Spain**, renowned for its **Moorish architecture**, intricate ornamentation, and layered historical significance. The structure's **reddish walls, towers, and domes** rise from a lush foreground of **greenery**, creating a vivid contrast between nature and architecture. In the distance, the **snow-capped Sierra Nevada mountains** loom, their grandeur amplified by the presence of a **full moon** in the sky. This celestial element adds a poetic stillness to the scene, evoking the Alhambra's role not just as a political and military stronghold, but as a site of **philosophical reflection, poetic tradition, and cross-cultural synthesis**.

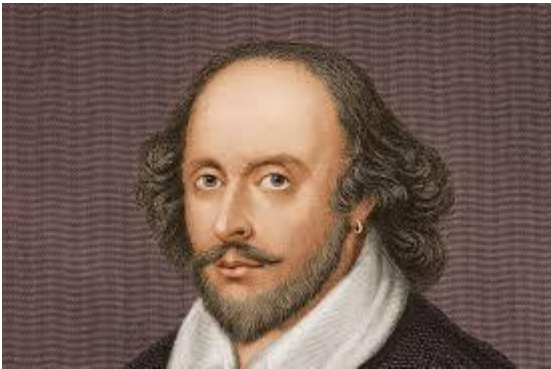


This image captures a tender moment in the wild: a **large adult bear** standing protectively beside its **cub**, both nestled in a grassy landscape. Their **thick fur**, blending shades of **brown and gray**, suggests a species adapted to colder climates—possibly grizzlies or Eurasian brown bears. The adult gazes directly at the viewer, exuding calm authority, while the cub, slightly turned, evokes curiosity and dependence. Man and animal breath together, and maternal instincts are the same across species.

Proposal 6 – Just La Republique des lettres ?



The Rhine. Water is the Fountain of possibilities, and Origin of life. I was taken apart, put me back together again, as a lot water in the rivers of Europe has kept flowing to the sea.



This portrait presents **William Shakespeare**, the iconic English playwright and poet whose works have shaped the foundations of Western literature. His visage is marked by a **high forehead**, **receding hairline**, and **curled hair at the sides**, complemented by a **trimmed beard and mustache**. He wears a **white collar** and **dark garment**, evoking the Elizabethan style of the late 16th century.



The image captures **St. Mary's Basilica** in Kraków, Poland, a Gothic masterpiece anchoring the **Main Market Square**. Its most striking feature is the **asymmetrical twin towers**—the taller of which hosts the **Hejnal mariacki**, a traditional trumpet call played hourly. The basilica's **red brick façade**, **pointed arches**, and **ornate spires** evoke medieval grandeur, while the surrounding square buzzes with life: **historic buildings**, **café terraces**, and a **statue** in front of the church frame the scene.

The sky, painted in **dramatic hues of sunrise or sunset**, casts a warm glow over the architecture, enhancing the **vibrant and atmospheric quality** of the square. The interplay of light and shadow, coupled with the basilica's verticality, creates a sense of **timeless reverence and civic vitality**—a living symbol of Kraków's cultural and spiritual heritage

Proposal 7 – A Great Erotic Life, Friendships, Material Security, Discovery of Nature & Desires are what European man is made up of



Kohl-Mitterrand. Franco-German Peace and Reconciliation celebrated at Verdun. Their structured rivalry has defined the EU Integration Project, something we must take into consideration, even as move on.



Sandro Botticelli's *The Birth of Venus* (c. 1485) depicts the goddess Venus emerging from the sea on a shell, embodying idealized beauty and divine love. The painting combines mythological subject matter with graceful linearity and flowing forms characteristic of the Early Italian Renaissance. Its ethereal palette, elegant contours, and allegorical symbolism have made it an enduring icon of art and humanistic ideals.



The Swedish rolling landscape unfolds in gentle, undulating hills blanketed with lush green meadows, dotted with forests, lakes, and traditional red wooden farmhouses. This serene terrain, particularly in regions like Skåne and Uppsala, reflects a harmonious blend of natural beauty and pastoral life, where soft elevations meet open fields under expansive skies. Its calm, rhythmic contours capture the quiet charm of Sweden's countryside, inviting reflection, exploration, and a deep connection with nature.

Proposal 8 – The Birthpangs of a New Europe organized around individualism, native people, existing cultural heritage and strong leadership and good governance. Get organized Boys!



The Minoans are the Mother culture of Europe



Authentic means a person who speaks with authority, by being himself since Kirkegaard. Man is one and indivisible. Hin enkelte is a singular whole in thought and existence. To live authentically is to embrace this unity, confronting life with integrity and self-awareness. When your love tells you, just be yourself as an encouragement to carry on, this bears the hallmark not of a self-confident civilization but of a militant skeptical Europe that never cease questioning itself.

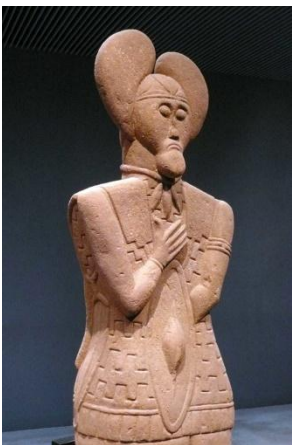


Native

Proposal 9



The Frauenkirche stands as a consummate expression of Baroque spatial drama, where mass, light, and curvature orchestrate an architecture of emotion. Its reconstruction after destruction transformed it into a symbol of continuity across rupture, proving that Baroque form can be reborn without nostalgia. The building's dynamic interior volumes anticipate modern concerns with immersive civic space and the choreography of public experience. Even today, its silhouette informs debates on heritage, identity, and contemporary urban meaning. Certainly, a prominent role for women in society is a hallmark of a civilization in ascendance. Restoring the Church was a wise decision by the German government.



The Hallstatt culture was the leading Early Iron Age society of Central Europe (ca. 1200–450 BCE), centered around the Austrian site of Hallstatt and associated with Proto-Celtic-speaking populations that later spread to La Tene culture.



Claude Monnet, French Painter.

The painted self-portrait turns the artist into both observer and observed. It stages identity as something crafted, performed, and consciously revealed. It opens a window into interior states that no external portrait can access. It becomes a meditation on the act of creation itself, with the artist as subject.

Proposal 10



Marie Curie was a pioneering physicist and chemist whose discoveries of polonium and radium reshaped modern science, and she remains the only person ever to win Nobel Prizes in two different scientific fields. Revolutionized modern physics and chemistry through her work on atomic structure and radioactive decay. Opened doors for women in science by breaking academic and institutional barriers. Left a scientific legacy continued by her daughters, especially Irène Joliot-Curie, also a Nobel laureate.



The Sagrada Família rises like a living organism shaped by stone, light, and devotion. A rainbow arcs above it, forming a fleeting covenant and a stairway to Heaven, a society and international system inclusive eof the EU. The basilica's spires seem to breathe as the sun casts warm, shifting tones across their surfaces. Gaudí's vision feels both ancient and futuristic, suspended in perpetual becoming.



Dolomites with their jagged summits, high-altitude plateaus, and deep valleys make them a world-renowned destination for hiking, climbing, and alpine landscapes

Proposal 11



Dreyfuss wears a dark suit with a high-collared white shirt and a cravat or tie, suggesting upper-class or professional status. His facial features include a prominent mustache and a monocle over his right eye, adding a touch of aristocratic or intellectual flair. He is bald on top with hair on the sides, and the photograph has a soft vignette effect around the edges, enhancing its antique quality, contrasts with the ornate intricacy of Ukrainian Baroque sculpture, where elaborate forms and gilded details celebrate religious and cultural tradition.. He stands for the *rational, administrative, institutional* side of the nation.



This sculpture captures a moment of intense emotional and spiritual expression. The robed figure, likely a saint or biblical character, is rendered in a dynamic pose—head tilted upward, one arm outstretched—as if in supplication, revelation, or divine ecstasy. The golden garment flows with dramatic folds, catching the light in a way that accentuates movement and theatricality, hallmarks of Baroque artistry. The craftsmanship is meticulous: the lifelike rendering of the face and hands suggests a deep concern with human emotion and divine presence. The overall composition evokes themes of transcendence, devotion, and the tension between earthly suffering and celestial grace. It may have once adorned a church altar or been part of a larger religious tableau, designed to inspire awe and spiritual reflection. He stands for the *cultural, historical, and aesthetic* side of the European nation.

$$S^2 \setminus D$$

Always a good idea to play the Ball instead of the Man.

Proposal 12



The cave embodies **the threshold between the unknown and knowledge**, as seen in later allegories like Plato's, representing the journey from instinctive survival to reflection, storytelling, and the birth of human imagination. In this sense, caves are more than physical refuges—they are **the crucibles where humans first confronted nature, themselves, and the beginnings of culture and meaning**. The use of your imagination is an important part of being human, and letting in light and connect with the oceans refers both to the Atlantic and Mediterranean part of Portuguese-European Heritage.



Antonio Canova's *Psyche Revived by Cupid's Kiss* (1787–1793) is a marble masterpiece of Neoclassical sculpture that captures the mythological moment when Cupid awakens Psyche with a kiss, symbolizing the triumph of love and soul over death. It is housed in the Louvre Museum in Paris and is celebrated for its emotional intensity and technical virtuosity. Canova's sculpture, with its delicate marble forms and refined classical elegance, contrasts strikingly with the rugged, mysterious beauty of a Portuguese cave in the Algarve. Yet together, they create a dialogue between human artistry and the raw creativity of nature, highlighting how both can inspire awe and contemplation.



European Bison: Strength, Freedom and Pride combined with Power, Vitality and untamed Wilderness, Endurance and Heritage. A must.

Proposal 13



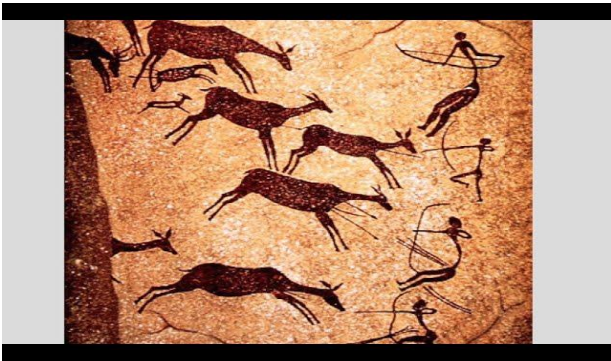
Christopher Columbus, whose voyages reshaped the known world, stands in contrast to the quiet reverence of Georgia's monasteries, where centuries of spiritual and artistic tradition endure. Meanwhile, the dramatic Norwegian fjords evoke the raw power and majesty of nature, completing a triad that spans exploration, culture, and landscape.



PROPOSAL 14



Lake Bled, with its serene waters and misty alpine backdrop, forms a striking contrast to the lively presence of the Three Slavic Girls, whose vibrant energy and folkloric charm celebrate human culture. Nearby, the cave paintings anchor the scene in deep history, linking past and present through the enduring expression of creativity. Together, these elements weave a tapestry of nature, culture, and timeless artistic heritage



PROPOSAL 15





Fusion Energy and *Soaring Whale* stand in striking contrast: the former pulses with abstract innovation and scientific intensity, while the latter soars with organic grace and natural serenity. Yet, together, they create a dialogue between human ingenuity and the elegance of the natural world, culminating in the classical mastery of Frans Hals' *Le Cavalier*, which grounds this interplay in timeless artistry.

PROPOSAL 16



David Hume (1711–1776) was a central figure of the **Scottish Enlightenment**, known for his radical empiricism and skepticism. He argued that all human knowledge derives from **experience**, not innate ideas, emphasizing observation over abstract reasoning. Hume famously challenged notions of **causality**, claiming that what we call cause and effect is a habit of mind, not a necessary connection in the world. He also explored **human nature**, morality, and emotions, arguing that reason alone cannot motivate action; instead, **passions guide behavior**.
WAKE UP!

The IUCN Tree, symbolizing global ecological awareness, links these realms of thought and history, bridging philosophy, virtues through ages, and the natural world. Together, they form a triad of intellect, culture, and environmental significance.



This sculpture depicts the **Three Graces**—Aglaea, Euphrosyne, and Thalia—embodying charm, beauty, and creativity, their intertwined bodies creating a sense of unity and rhythm. One Grace holds a **feathered arrow**, suggesting love and playfulness, while their gentle gestures convey harmony and shared purpose. Their calm, idealized expressions emphasize classical beauty and introspection. The presence of a **lyre**, associated with Apollo, links the scene to divine inspiration, artistic order, and poetic harmony. The arrow motif juxtaposes human passion with spiritual and artistic ideals. The intertwined poses and flowing curves create a visual rhythm that balances elegance with narrative subtlety. Overall, the sculpture fuses **beauty, love, and inspiration** into a harmonious, neoclassical composition. It transforms myth into a delicate dialogue between **sensuality, creativity, and divine order**. Men do not know what is at variance agrees with itself. It is an attunement of opposite tensions, like that of the bow and the lyre (Heraklit). And women are great at ensuring prosperous, stable and creative polities. Thorvaldsen were later to revert to a more austere style being a refined Italiano in the most Danish manner. Happy Alchemy ?

Proposal 17

In the quiet interplay between memory, nature, and civic architecture, three scenes unfold—each bearing the weight of history, vitality, and cultural gravitas.



A bronze girl stands in solemn stillness, her braided hair and delicate frame cradling a bouquet of wheat and yellow flowers. The small Ukrainian flag she holds flutters gently, a whisper of national resilience. Behind her,

a softly glowing tower rises like a candle of remembrance, anchoring the space in reverence. This is no ordinary statue—it is a living elegy to the victims of the Holodomor, the man-made famine that scarred Ukraine in 1932–33. Her gaze, quiet and unwavering, speaks of hunger, loss, and the enduring dignity of a people who remember.



Elsewhere, in a grassy field bordered by forest, a red deer lifts its head and calls into the autumn air. Its antlers crown it with primal majesty, its posture taut with instinct and seasonal urgency. This is the rut—the ancient rhythm of courtship and dominance played out in the wild. The scene pulses with life, with the raw choreography of survival and reproduction. Nature here is not passive; it is expressive, vocal, and deeply embodied.



And then, across the Seine in Paris, the Institut de France rises in classical symmetry, its dome catching the soft light of dawn or dusk. From the Pont des Arts, the view is framed by wooden planks, wrought iron railings, and benches that invite reflection. The street lamps glow like quiet sentinels. This is the seat of the Académie Française, where language is curated, tradition preserved, and civic imagination shaped. The architecture speaks in measured tones—of Enlightenment ideals, of intellectual continuity, of the city as a vessel of meaning.

Together, these three images form a triptych of remembrance, vitality, and cultural stewardship. The girl, the stag, the dome—each holds a space in the human story, where grief becomes symbol, instinct becomes ritual, and stone becomes thought.

Images Are Grateful

The careful selection of motifs ensures that coins carry a layered narrative, even in the absence of interactive features such as augmented reality. Lower denominations, including the 5, 10, and 20 cent coins, can emphasize mythic or ecological motifs, mid-range coins such as the 50 cent and €1 coins can highlight human achievement and architectural innovation, while the €2 coin can reinforce themes of continental unity. This hierarchy mirrors the narrative progression established for banknotes, creating a cohesive storytelling framework across ages and the entire Euro system.

1 Cent

There are quite a few regional cultures that warrants as European such as a Celtic and Minoan, Cucuteni and Megalithic Atlantic.

The work with clay by humanity represents one of the earliest and most enduring acts of mediation between nature and culture: earth is transformed by hand, water, air, and fire into objects that store food, mark ritual, structure daily life, and carry symbolic meaning across generations. Clay work is thus simultaneously technological, social, and cosmological, binding subsistence, settlement, and imagination into a single material practice.

In this perspective, the Linearbandkeramik (LBK) culture marks a decisive threshold in European prehistory. Its ceramics are not merely containers but signatures of a new sedentary order: longhouses, fixed fields, inherited land, and repeatable patterns of life. The linear bands incised into LBK pottery function as a visual grammar of early agrarian Europe—standardised, transmissible, and recognisable across wide territories—signalling shared norms, exchange networks, and an emerging continental coherence. Clay, in the LBK world, becomes a medium through which Europe's first large-scale social, economic, and spatial integration is materially inscribed.



2 Cent

The Cucuteni-Trypillia culture was a large, advanced Neolithic to Chalcolithic civilization in Southeast Europe (modern Romania, Moldova, Ukraine) from roughly 5500–2750 BC, famous for its massive, planned settlements (megasites), sophisticated pottery with intricate designs, early multi-story houses, and unique ritualistic burning of settlements every 60-80 years, representing one of Europe's most complex prehistoric societies before its mysterious decline.

Pick one of these coins



Linearbandkeramik

Cucuteni-Trypillia

Atlantic Megalithic Europe

5 Cent

The obverse features **Marianne**, the allegorical embodiment of the French Republic, wearing a Phrygian cap — a symbol of liberty since the French Revolution. But the stylization here is strikingly martial: the angular jawline, forward gaze, and wind-swept hair evoke not just liberty but **defiance**, **mission**, and **sacrifice**. Your impression

of **Jeanne d'Arc** is compelling — this is not a passive emblem of civic virtue but a figure of **mobilised conviction**, almost prophetic. The twelve EU stars encircle her like a halo or a tactical constellation, suggesting France's republican spirit is both **anchored in Europe** and **animating it**. The “RF” (République Française) is assertively placed, reinforcing national authorship within a shared European frame.

This is not Marianne as muse — it's Marianne as **strategic actor**, a Jeanne d'Arc of the Union, bearing liberty not as abstraction but as **mission directive**.



The reverse, shared across eurozone coins, presents a globe with Europe prominently positioned, flanked by vertical lines and stars. But the composition is **curiously inward-folding**. The globe is not open or expansive; it's **encased**, almost **gridded**, with Europe at the center of a stylised network. The vertical lines suggest **integration**, **connectivity**, or perhaps **containment** — a Europe structured by its own internal logic. The stars, echoing the EU flag, reinforce the idea of unity, but here they seem to orbit Europe rather than radiate outward.

This side doesn't depict Europe as a global actor reaching out — it shows Europe as a **system unto itself**, a **self-referential constellation**. The coin's reverse is not about Europe's place in the world, but about **Europe as world**, a closed loop of values, institutions, and symbolic geometry.

Together, the two sides stage a subtle tension: the **national side** projects France's republican energy outward, almost mythically, while the **common side** folds Europe inward, into a structured, self-referential order.

The coin becomes a dialectic: **mission versus system**, **spirit versus structure**, **Jeanne d'Arc versus Brussels geometry**. It's a small coin, but it carries a large conversation — about how Europe sees itself, and how its member states animate that vision. This coin, with its stylized Marianne, evokes not just liberty but mission — a Jeanne d'Arc of the Republic, poised within Europe's constellation. Its reverse, however, folds Europe inward, a gridded globe that suggests containment more than outreach. I chose this piece because it stages a tension: national spirit versus systemic geometry. It feels transitional — a coin caught between eras, between myth and mechanism. As we move toward the next generation, this one marks the pivot: from emblem to architecture, from symbol to system.

The grid suggests that Europe is not just a place but a **system of coordinates**, a structured field of governance, trade, and integration. Rather than depicting Europe as a free-floating continent, the lines imply **containment**, **calibration**, and **internal logic**. Europe is shown as a **self-referential lattice**, a space defined by rules, institutions, and interlocking frameworks — not by borders alone. These lines also echo the **machine-readable logic** of modern coin design. The euro coin series was engineered for compatibility with vending machines, transit systems, and automated sorting. The grid visually reinforces this — it's not just symbolic, it's **functional**, suggesting that Europe's currency is designed to operate within a **technocratic infrastructure**. The lines become a metaphor for **interoperability**. The most profound impact is rhetorical. Instead of showing Europe radiating outward, the grid folds it inward. The globe is not open and expansive — it's **encased**, suggesting a Europe that is **more concerned with internal coherence than external projection**. The lines don't connect Europe to the world; they **frame Europe within itself**. This shifts the message from “Europe as global actor” to “Europe as system of systems. In sum, the cross-cutting lines are not decorative. They encode a vision of Europe

as **structured, interoperable, and self-defining** — a continent that sees itself through the lens of geometry, not mythology. They are the visual counterpoint to Marianne’s forward gaze: where she moves, the grid holds.

The tomb of Persian Kings in the Pasargadae valley is in Phrygian style similar to the Marianne wears.

In the alternative, think about this coin not as a tension between national myth and European geometry, but as a meditation on **orientation**. Marianne’s forward gaze becomes a vector, a directional force, while the reverse’s gridded globe becomes a coordinate system — a map of constraints rather than a portrait of Europe. The coin then reads as a negotiation between **trajectory** and **structure**, between the impulse to move and the framework that holds movement in place. In this view, you chose it because it captures a Europe that is not static but **seeking alignment**, calibrating its path within a self-imposed lattice. It becomes a small artefact of a larger question: how does a union find direction without losing coherence.



I might add, I don’t give a damn anymore of Hans and Marianne other than as a legacy dyad, whose structure rivalry keep be a major driving but also someone we dream about transcending. I would at all times prefer a Jeanne d’Arc, now on paper the power distributional conflict appears to have been solved between France and Germany.

10 Cent

The portrait of **Miguel de Cervantes**, author of *Don Quixote*, is not merely commemorative — it’s a declaration. Spain positions its literary genius as a **civilizational contributor**, anchoring its identity within the European project through cultural excellence. Cervantes is rendered in a stylized, almost timeless manner, suggesting that Spain’s intellectual heritage is not past-bound but **perennially relevant**. The quill and signature beneath his name reinforce authorship — Spain as a **writer of Europe’s story**, not just a participant.

The inscription “ESPAÑA” crowns the composition, asserting national authorship with clarity. The twelve EU stars encircle Cervantes, not as constraint but as **context** — Spain’s cultural voice framed within a shared European constellation. Cervantes is a bit blurred – perhaps you should have listened to Sancho Pansa, more.



Though not visible here, the reverse of all euro coins features the denomination and a globe with Europe at its center. As discussed earlier, this side conveys **Europe as system**, a structured actor in the world. The Spanish national side complements this by offering **narrative substance** — Cervantes as storyteller, Europe as stage. This coin stages Spain as a **cultural sovereign within a shared system**. Where France's Marianne evokes mission and defiance, Spain's Cervantes evokes **authorship and legacy**. The coin doesn't dramatize tension — it harmonizes. Spain's contribution to Europe is not martial or mythic, but **literary, intellectual, and enduring**.

20 Cent

Botticelli's *Birth of Venus* introduces the erotic not as excess or transgression, but as a civilising force at the heart of human life. Venus emerges from the sea not simply as a body to be desired, but as a principle of attraction that binds the world together: beauty draws beings toward one another, creates harmony, and awakens consciousness itself. The erotic here is generative rather than consumptive, a movement that brings form out of matter and sociability out of isolation.

In this sense, the erotic stands alongside friendship, wealth, experiences of the natural world and desire as one of the fundamental energies through which human societies organise themselves. Friendship channels attraction into trust and loyalty; wealth translates desire into accumulation and exchange; the erotic transforms longing into recognition of the other. Botticelli's Venus holds these forces in balance. She is modest yet exposed, solitary yet immediately relational, suggesting that civilisation depends not on suppressing desire but on shaping it—allowing eros to circulate between bodies, friends, cities, and economies as a source of creativity, cohesion, and meaning.



The Brandenburg Gate is not just a monument — it is a **threshold**, historically charged with the memory of division and the promise of unity. Once a symbol of Cold War separation, it became the emblem of German reunification after 1989. By placing it on the national side of the euro coin, Germany asserts a **narrative of healing**, positioning itself as a reconciled actor within Europe.

But the design goes further: Heinsdorff's rendering uses **deliberate perspective**, showing the Gate from a frontal, slightly open angle. This isn't a closed wall — it's a **passageway**, a visual metaphor for **Germany's openness to Europe**. The twelve EU stars encircle the motif, not as containment but as constellation, suggesting that Germany's unity is nested within a broader European order.

50 Cent

Unlike France's Marianne or Spain's Cervantes, which foreground national myth or cultural legacy, Germany's coin uses architecture to signal **structural transformation**. The Gate becomes a **portal between past and future**, between national sovereignty and European integration. It's not heroic or literary — it's infrastructural, almost constitutional.



This choice reflects Germany's postwar identity: restrained, institutional, and oriented toward **systemic stability**. The coin doesn't dramatize — it **architects**. It offers a vision of Europe as a space of passage, not rupture.

The German 20 cent coin could become the European fifty cent Euro, then.

Where France's coin stages a tension between mission and system, and Spain's coin harmonizes cultural pride with European context, Germany's Brandenburg Gate coin **resolves**. It presents unity not as aspiration but as **achieved structure**, a built environment that holds memory and future in balance. Evocative: Germany wants to save Europe, Russia to initiate it. In the original version, it says Go through the gate!. It was only later via Dante that a man, or Double in Dostojevskijs case became a perjorative, a person who become portalised is a victim of a logic he doesn't understand himself, but this is not what was originally associated with a gateway or a Bab which served as an entry point to another realm calling on Man to enter into. Does this make the Brandenburger Tor relevant through a change of the meaning attributed to it ?

In the alternative, the Austrian 50 euro cent coin, featuring the **Vienna Secession building**, is one of the most conceptually rich and culturally assertive designs in the euro series. Let's unpack its symbolic architecture and rhetorical stance. The **Secession building**, completed in 1898, was the architectural manifesto of the Vienna Secession movement — a breakaway from academic art toward modernism, abstraction, and pluralism. By placing this building on its coin, Austria doesn't just commemorate a structure; it **declares allegiance to artistic rupture**, to the idea that culture evolves through dissent and reinvention.

The inscription "VER SACRVM" (Sacred Spring), referencing the movement's journal, reinforces this: Austria positions itself as a **source of renewal**, not just tradition. The building's golden dome — stylized here in relief — becomes a metaphor for **intellectual flowering**, for Europe as a space of aesthetic and philosophical experimentation.

This is not a monument to empire or unity — it's a **temple of divergence**, a celebration of **creative pluralism** within a shared European frame. Art is a corrective to politics, not its replacement.



As with all euro coins, the reverse features the denomination and a gridded globe with Europe at its center. This side encodes Europe as **system**, as interoperable infrastructure. Austria's national side complements this by offering **cultural depth** — a reminder that Europe is not just a technocratic space, but a **civilizational project**. Austria's coin stages a subtle but powerful argument: that Europe's strength lies not in uniformity, but in **cultivated divergence**. Where Germany's Brandenburg Gate signals unity, and France's Marianne signals mission, Austria's Secession building signals **renewal through rupture**. It's a coin that doesn't just represent Austria — it **represents the European avant-garde**, the idea that modernity itself is a sacred spring. I like the idea of a new modernity conceived in Europe and I associate the architecture-painting-sculpture gesamtkunstwerk as an example of the primacy of politics and the corrective value of art throughout the ages.

1 Euro

This Italian 1 euro coin, minted in 2002, features **Leonardo da Vinci's Vitruvian Man** — a masterstroke of symbolic selection that fuses Renaissance humanism, scientific proportion, and European universality into a single visual statement.



The Vitruvian Man is not a portrait, not a monument, but a **diagram of ideal proportion** — a human inscribed within circle and square, echoing cosmic and architectural harmony. Italy's choice here is profound: it offers **not a hero, but a principle**. The coin doesn't commemorate a figure; it **embodies a worldview** — one in which man is the measure, and proportion is the path to truth.

By placing this image on its euro coin, Italy asserts its role as the **cradle of humanist geometry**, of the Renaissance synthesis between art, science, and metaphysics. The "RI" monogram (Repubblica Italiana) and the mint mark "R" for Rome are modestly placed, allowing the Vitruvian figure to dominate — as if Italy's identity is best expressed through **universal form**, not national assertion.

The twelve EU stars encircle the composition, but here they feel less like a political frame and more like a **cosmic echo** — reinforcing the idea that Europe is a space where human proportion and shared ideals converge. This coin stages Italy not as a sovereign actor, but as a **civilizational source code**. Where France offers mission, Germany offers architecture, and Austria offers rupture, Italy offers **harmonic origin**. The Vitruvian Man becomes a symbol of Europe's aspiration: to balance individuality and system, body and geometry, nation and union.

Europe has an ambition about man, and is a human centered where China is people centered.

It's one of the few euro coins that doesn't depict a person or place — it depicts a **concept**, and in doing so, it elevates the currency from medium of exchange to **medium of meaning**.

2 Euro

The image depicts **Europa**, a Phoenician princess, being abducted by **Zeus in the form of a bull**, a myth that gave Europe its name. By choosing this motif, Greece doesn't just assert cultural heritage — it **claims**

authorship of the European idea itself. The scene is dynamic, almost cinematic: Europa is mid-motion, the bull striding forward, suggesting not captivity but **transition**, a crossing from East to West, myth to polity.

This is not a static emblem — it's a **foundational myth in motion**, a visual metaphor for Europe's birth through encounter, hybridity, and transformation. The twelve EU stars encircle the scene, not as a frame but as a **halo of continuity**, linking ancient myth to modern union.

The use of bi-metallic design — silver outer ring, golden inner core — reinforces the idea of **dual identity**: national and supranational, mythic and monetary, ancient and modern.



Greece's coin stages Europe as a **mythic project**, not just a political one. Where Germany offers architecture, France offers mission, and Italy offers proportion, Greece offers **origin through metamorphosis**. The coin doesn't depict a hero or a building — it depicts a **moment of becoming**, a mythic crossing that still resonates.

It's one of the few euro coins that treats Europe not as a system or a value set, but as a **story**, and in doing so, it reminds the currency — and the Union — of its deeper symbolic roots.

This is a sticker. Or are political developments about to make it obsolete ? I like a lot the Cypriot Chalcothic stone figure, but perhaps you prefer the commemorative Coin from Paphos ? I suppose there are 'different layers to that one as well, n'est ce pas ?



The Cypriot €2 coin is a striking blend of ancient heritage and European identity. At its center stands a **Chalcolithic cruciform idol**, dating to around 3000 B.C., symbolizing Cyprus's deep-rooted cultural legacy. This stylized human figure, with outstretched arms and a minimalist form, evokes the island's prehistoric artistry and spiritual traditions. Encircling the idol are the bilingual inscriptions "**KYIΠOΣ**" (Greek) and "**KIBRIS**" (Turkish), reflecting the island's dual linguistic and cultural composition. The year of minting—**2022** in this case—is placed to the right of the central figure, anchoring the coin in contemporary time. The outer ring features **twelve stars**, emblematic of the European Union, affirming Cyprus's place within the shared European monetary and political framework. The coin's design thus weaves together **archaeological symbolism**, **linguistic plurality**, and **supranational affiliation**, making it a compact emblem of Cyprus's layered identity. Romans lifted the cross-symbol from Cyprus, turning it into an instrument of crucifixion, through which a Egyptian-Roman mystery cult was forged.

In **2022**, France issued a **€2 commemorative coin** celebrating the **35th anniversary of the Erasmus programme**, featuring Erasmus of Rotterdam with symbolic links across Europe. The coin is **bi-metallic**, **legal tender**, and circulated widely, with special collector versions also minted. It marks a **joint eurozone celebration** of student and youth mobility across Europe. I remember meeting a Spanish Erasmus student Ana MPG in Århus, gifting me Don Quijote by Cervantes, telling me to enjoy the reading and listening to Sancho Panza once in a while.

Technological Innovations

When the euro undergoes a changeover to a new series of banknotes and coins, there are numerous technological innovations and considerations that require careful attention by the European Central Bank, policymakers, citizens, and even individuals attempting counterfeiting. For the ECB and policymakers, the focus is on ensuring that security features are significantly advanced and resilient to sophisticated forgery attempts. This includes the incorporation of dynamic holograms, color-shifting inks, embedded security threads, micro-optical features, and transparent windows on banknotes. The introduction of polymer substrates enhances both durability and resistance to wear, addressing issues that have historically affected cotton-based banknotes, while hybrid or coated alloys for coins, particularly lower denominations, reduce corrosion and extend circulation life. These material innovations are complemented by machine-readable features that enable automated authentication across ATMs, vending machines, and point-of-sale systems, ensuring rapid verification and minimizing the risk of fraudulent transactions. Additionally, changes in coin weight, size, or composition must be carefully calibrated to maintain compatibility with existing cash-handling infrastructure, while upgrades to processing and sorting machines must be coordinated across member states to prevent operational disruption during the transition.

For citizens, the transition involves a period of familiarization with updated visual and tactile cues on both banknotes and coins. Denominations are differentiated through size, color, relief, and tactile markings, which are critical for accessibility, particularly for visually impaired users. Public education campaigns and informational materials become essential to ensure that all members of the population can reliably recognize and authenticate the new currency. Furthermore, emerging hybrid physical-digital features may appear on banknotes and coins, such as embedded micro-codes or markers readable via mobile applications or other verification devices, which allow individuals to independently confirm authenticity and interact with smart vending systems, creating a more secure and technologically integrated cash ecosystem.

From the perspective of counterfeiting, the new series presents significant obstacles due to the sophistication of security features and the integration of machine-readable and traceable elements. Holographic foils, micro-optical elements, color-changing inks, polymer materials, and complex edge inscriptions substantially raise the technical threshold for creating convincing counterfeits. Automated detection systems embedded in ATMs, retail terminals, and vending machines ensure that even minor deviations from the official standards are quickly identified, reducing the success rate of illicit operations and increasing the likelihood of detection. Traceable micro-patterns or embedded codes further allow authorities to monitor suspicious currency circulation in real time, enhancing law enforcement capability and deterring criminal activity.

The broader implications of these technological innovations extend to governance, operational coordination, and the overall stability of the eurozone financial system. Effective policy requires harmonized issuance schedules, consistent technical standards across member states, and coordinated public awareness initiatives. Training for

bank personnel, retail operators, and public institutions is crucial to ensure seamless adoption of the new currency. By embedding advanced security, durability, and machine-readability into the new series, the euro not only strengthens public trust and confidence but also reinforces financial integration and the functional resilience of the currency union. The changeover period, which may involve temporary dual circulation of old and new series, provides a controlled environment to manage the transition, ensuring that commercial transactions, cash handling, and public adoption occur without disruption. In this way, the introduction of a technologically advanced euro banknote and coin series simultaneously addresses practical, security, and identity considerations, serving as both a medium of exchange and a symbol of European unity and innovation.

Globally, **most technologically safe banknote series and coinage practices** combine multiple advanced security measures, durable substrates, and machine-readable features that make them exceptionally difficult to forge. Among all currencies, the **Swiss franc** currently holds a reputation for having some of the most secure banknotes in the world. The Swiss National Bank's notes (especially the modern series, such as the 100-franc note issued in 2019) embed at least **20 cutting-edge security features**—including see-through registers, raised printing, watermarks, micro-perforations, ultraviolet and infrared properties, and complex optically variable elements—making them *extremely difficult to counterfeit effectively*. This level of protection positions the franc at or near the top in contemporary security rankings for paper currency. ([Guinness World Records](#))

The **euro** positions itself strongly within global best practice by incorporating many of the same modern anti-counterfeiting technologies, though its concrete ranking relative to every national currency varies by denomination. The **Europa series** of euro banknotes—covering €5 up through €200—features multiple sophisticated elements designed to resist forgery while remaining user-friendly for verification by the public. These include **portrait windows embedded in the hologram, emerald numbers that shift color and reflect light dynamically, watermarks, security threads, and intaglio printing that creates raised tactile features**. The portrait window in particular is a state-of-the-art innovation that appears transparent when held to the light and reveals a detailed figure within the hologram, which helps both machines and individuals authenticate notes. ([Bundesbank](#))

In terms of actual performance, euro banknotes have historically remained very secure in circulation: the number of counterfeit euro banknotes detected has been **low relative to the total number of genuine notes in circulation**, with detection rates on the order of tens of counterfeit notes per million genuine notes. For example, recent ECB statistics indicated extremely low counterfeit incidence, showing that the security architecture of the euro series continues to be effective at deterring large-scale forgery. ([European Central Bank](#))

Best practice for banknote security worldwide combines a **layered approach** of visible and machine-readable features. Visible components such as watermarks, color-changing inks, see-through elements, and raised intaglio printing help the public and retail cash handlers identify authentic notes. Behind the visible layer, **hidden components** such as embedded threads, UV-reactive inks, infrared patterns, and microprinted text further frustrate counterfeiters. Polymer substrates, used by leading series such as the **Australian dollar** and many newer issues globally, enhance durability and add another dimension of security by incorporating transparent windows and complex embedded features that are hard to replicate. ([World Economic Forum](#))

For coins, best practice focuses on **unique alloys and shape/edge characteristics** that are difficult to duplicate without specialised minting technology. The euro already incorporates sophisticated solutions in this area: the €1 and €2 coins use **bi-metallic constructions** and edge inscriptions; mid-range denominations (10c, 20c, 50c) use a proprietary **Nordic gold alloy** that is difficult to melt or alter; and machine-readable properties ensure vending machines and cash handlers can reliably distinguish genuine coins. ([European Central Bank](#))

Where the euro positions itself is thus as one of the **more secure and technologically advanced currency systems** in the world, with modern design and anti-counterfeiting technology aligned with global best practices. Although some national currencies (such as the Swiss franc or certain polymer note series) may edge the euro in terms of raw security feature counts or substrate innovation, the euro's combination of widespread circulation, robust security, and machine-readability places it in the upper tier of existing banknote and coin series internationally.

Technology, Social Equity & Acceptance

The European Union has undertaken a comprehensive regulatory initiative to clarify the legal status of money in the euro area and to adapt the concept of legal tender to a rapidly changing payments landscape. Enter the regulation on the Euro as legal tender against the rapid decline of cash payment and the introduction of a digital Euro. At the core of this initiative is the recognition that the traditional legal tender status of euro banknotes and coins, although formally established under EU law, has been progressively weakened in practice by the declining acceptance of cash in everyday transactions. This erosion is closely linked to the rapid growth of electronic and card-based payments, as well as to the increasing reliance on private payment infrastructures.

Under current EU law, euro banknotes and coins constitute legal tender in the euro area, meaning that they must, in principle, be accepted at full face value and can discharge a monetary obligation when offered for payment. However, the absence of a harmonised and binding interpretation of legal tender has allowed for significant national variation and for widespread contractual or de facto exclusions of cash, particularly in retail settings. The European Commission and the European Central Bank have identified this discrepancy between legal theory and market practice as a systemic risk, particularly for financially vulnerable groups and for the continued role of central bank money in the economy.

In response, the European Commission presented in 2023 the so-called Single Currency Package, which consists of two interlinked draft regulations. The first concerns the legal tender status of euro banknotes and coins. Its objective is to clarify and strengthen the obligation to accept cash in physical, face-to-face transactions throughout the euro area, subject only to narrowly defined and proportionate exceptions. Member States would be required not only to recognise cash as legal tender in law, but also to actively monitor its acceptance in practice and to take corrective measures where acceptance is undermined. This proposal reflects the EU's intention to ensure that cash remains a viable and usable means of payment rather than a merely symbolic one.

The second proposed regulation establishes the legal framework for a digital euro. The digital euro is conceived as a central bank-issued digital form of money, denominated in euro and convertible one-to-one with cash and commercial bank deposits. Importantly, the proposal assigns legal tender status to the digital euro as well, thereby placing it on the same legal footing as physical cash. This would imply that, once implemented, the digital euro must in principle be accepted for payments within the euro area, subject to specific and limited exemptions, such as technical infeasibility or proportionality considerations for very small enterprises.

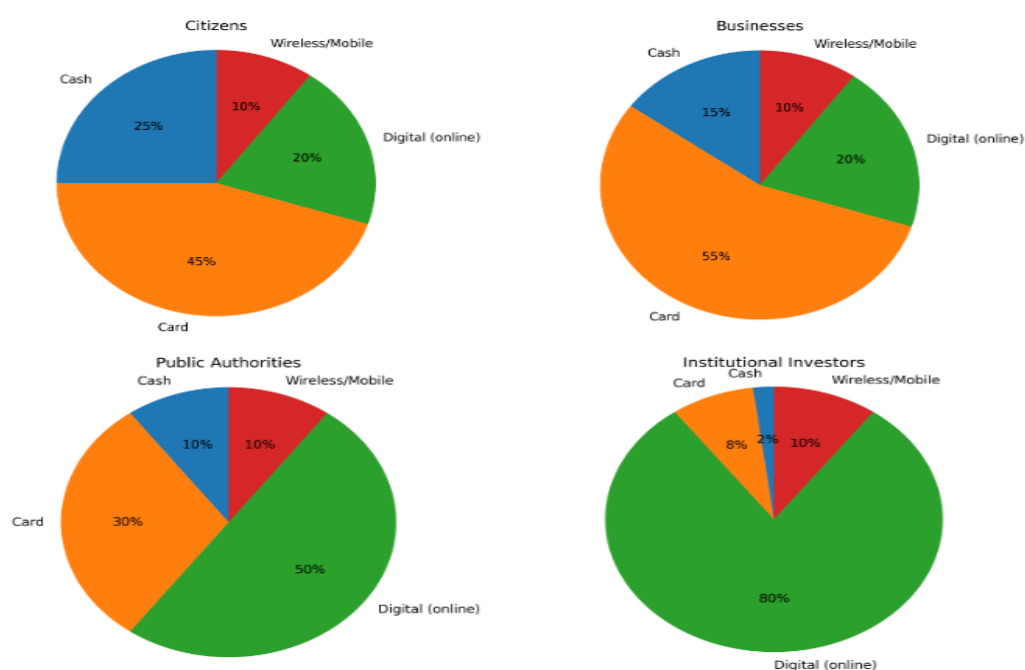
The introduction of the digital euro is explicitly framed not as a replacement for cash, but as its complement. EU institutions consistently emphasise that citizens should retain freedom of choice between physical and digital forms of central bank money. This dual-pillar approach reflects concern over the declining share of cash in retail payments. According to ECB data, the proportion of point-of-sale transactions settled in cash has fallen sharply over recent years, both in volume and in value, while card and other electronic payment instruments have become dominant. The absence of a public, central-bank-issued digital alternative has left the digital payments space almost entirely in the hands of private actors, raising issues of strategic autonomy, competition, resilience, and monetary sovereignty.

Within this context, the digital euro is intended to preserve access to central bank money in an increasingly digital economy, while the strengthened legal tender rules for cash are designed to prevent financial exclusion and ensure continuity in payment systems under all circumstances, including crises or outages. Both initiatives are therefore part of a single regulatory logic aimed at safeguarding the role of public money in the euro area.

The European Central Bank has issued a stark warning: absent a digital euro, the euro area risks a structural erosion of monetary sovereignty, diminished consumer agency, and deepening reliance on non-European payment infrastructures. Over the past five years, cash usage has declined precipitously—from 68% to 40% in transaction volume and from 40% to 24% in value—effectively marginalising citizens' access to central bank money, which remains confined to physical form. This trend undermines the foundational principle of the euro as universally accepted sovereign money. In the vacuum left by cash, non-European private systems have proliferated, with only seven euro area countries retaining national card schemes, none of which are interoperable. European dominance in e-commerce payments is limited to just three member states, exposing the continent to strategic dependency. Despite a quarter-century of monetary union, Europe still lacks a pan-

European digital payment solution for retail, online, and peer-to-peer transactions. Private-sector initiatives have repeatedly failed due to fragmentation and coordination deficits, while SEPA remains confined to bank transfers. In the absence of a public digital alternative, market concentration intensifies, empowering private providers to raise fees and constrain merchant leverage. A digital euro would introduce open standards, countering monopolistic lock-in and enabling European scale. The ECB also highlights systemic vulnerability: current digital systems depend on internet access and private infrastructure, lacking sovereign fallback mechanisms such as offline functionality. Historical precedents, including the Bundesbank's contingency currency reserves, underscore the necessity of sovereign continuity. Crucially, the ECB rejects the binary framing of public versus private money, affirming their historical coexistence and the anchoring role of central bank money. Without a digital euro, this anchor weakens, jeopardising the singleness of the currency. The cost of inaction is profound: consumers lose the freedom to choose sovereign money, merchants face rising costs, and Europe forfeits control over critical infrastructure. Ultimately, monetary sovereignty erodes as the euro becomes tethered to foreign private rails.

Figure



The euro area's payment landscape is undergoing a profound transformation marked by the decline of physical cash and the rise of digital payment modalities. Between 2019 and 2024, the share of cash in transaction volume fell from 68% to 40%, and from 40% to 24% in value terms, reflecting a structural shift away from sovereign money in its physical form. This erosion is particularly acute in e-commerce and urban retail environments, where private digital infrastructures—cards, mobile wallets, and online platforms—have become dominant. Despite the euro's foundational promise of universal access to central bank money, citizens increasingly lack practical means to use sovereign currency in digital contexts.

The European Central Bank (ECB) has identified this trend as a threat to monetary sovereignty, consumer freedom, and systemic resilience. The absence of a pan-European digital payment solution has left the euro area reliant on non-European providers, with only seven member states retaining national card schemes and European dominance in online payments limited to three jurisdictions. Fragmentation persists despite SEPA's harmonisation of bank transfers, as point-of-sale and peer-to-peer payments remain unstandardised.

In response, the ECB advocates for the introduction of a digital euro to serve as a public anchor in the evolving payment ecosystem. Such an instrument would offer offline functionality, privacy safeguards, and universal acceptance, countering monopolistic tendencies and reinforcing the singleness of the currency. The digital euro is not conceived as a replacement for cash but as a complement that restores access to sovereign money in digital

environments. Without it, Europe risks ceding control over critical infrastructure, weakening its monetary autonomy, and compromising the integrity of the euro as a symbol of shared sovereignty.

Pierro Cipollone, amember of the ECB board states

First, the role of cash will be significantly reduced if we do not provide a digital equivalent. If we fail to act, we will fail to fulfil our responsibility as a central bank towards the people we serve.

Second, our monetary sovereignty is eroding. People's ability to pay across the euro area with sovereign money – cash – and frequently choosing to do so, is a key pillar of monetary sovereignty. A digital form of cash would protect our sovereignty and ensure our monetary union is also a digital monetary union.

Third, what is particularly concerning in Europe is that the gap left by declining cash use is being filled by non-European payment solutions. For card payments, only seven out of the 20 euro area countries have a national card scheme. These card schemes cannot be used in other euro area countries and are also losing market share domestically. For e-commerce, European-owned solutions are prevalent in only three euro area countries⁴

The first implication concerns the **functional continuity of sovereign money**. If cash continues to decline without a publicly issued digital counterpart, the euro will lose its universal usability in everyday transactions, undermining the central bank's foundational responsibility to provide citizens with an accessible, risk-free means of payment. The absence of a digital equivalent would accelerate the marginalisation of cash, effectively excluding segments of the population from sovereign money and weakening the social contract underpinning monetary authority.

The second implication relates to the **erosion of monetary sovereignty**. The ability of citizens to pay with sovereign money across the euro area is not merely a technical feature of the currency but a constitutional expression of the singleness of the monetary union. As cash usage declines, this anchor weakens. Without a digital form of central bank money, the euro risks becoming a currency whose digital circulation is mediated entirely by private actors, thereby diluting the state's capacity to guarantee the integrity, neutrality, and universality of its own money.

The third implication concerns **strategic dependency and infrastructural vulnerability**. The vacuum created by declining cash use is increasingly filled by non-European payment solutions, both in card payments and in e-commerce. With only seven euro area countries maintaining national card schemes—none of which are interoperable—and European-owned e-commerce solutions dominant in only three jurisdictions, the euro area's payment ecosystem is drifting toward reliance on foreign infrastructures. This dependence exposes Europe to geopolitical, commercial, and technological risks, and undermines the EU's capacity to shape the standards and governance of its own payment system.

Taken together, these implications point to a structural imbalance: the euro remains a sovereign currency in legal form, but its practical circulation is progressively mediated by private and foreign infrastructures. A digital euro is therefore not simply an innovation project but a necessary intervention to preserve monetary sovereignty, ensure universal access to sovereign money, and secure Europe's autonomy in the digital payment domain.

In parallel, and complementing these measures, the EU has adopted a harmonised anti-money-laundering framework that will introduce, from 2027, a uniform upper limit of ten thousand euros on cash payments involving at least one professional party. This restriction does not negate the legal tender status of cash but imposes a proportional limitation justified by public-interest objectives. Taken together, the strengthened cash acceptance rules, the digital euro framework, and the AML cash cap represent a recalibration rather than a marginalisation of cash within EU law.

In sum, the emerging EU regulatory framework seeks to redefine legal tender for the digital age by reaffirming the practical usability of cash while simultaneously introducing a digital euro as a new form of public money. The overarching aim is to maintain monetary inclusiveness, legal certainty, and strategic autonomy in a payments

⁴ <https://www.ecb.europa.eu/press/key/date/2025/html/ecb.sp250714~437cfc6a51.en.html>

ecosystem increasingly dominated by private and digital instruments, while allowing the relative shares of cash and digital payments to evolve in response to user preferences rather than structural exclusion.

Legal Tender, Payment Choice, and the Emerging Structural Asymmetry

At the same time, the euro area faces a deeper normative and legal tension: the basic principle that citizens should be free to choose the medium through which they pay, and that vendors should be obliged to accept lawful tender, has never been fully codified in Union or national law. Legal tender status exists in a formal, declaratory sense, but it lacks the operational precision that would translate it into a concrete, enforceable right. As a result, the acceptance of cash—central bank money in its only currently accessible form—has become increasingly subject to private discretion rather than public guarantee.

This lacuna becomes more consequential as digital payment systems proliferate. The rapid expansion of card-based, mobile, and platform-mediated payments has created a situation in which **the practical usability of sovereign money is no longer universal**, but contingent on the technological preferences and commercial policies of private intermediaries. For many citizens, particularly elderly individuals, those with limited digital literacy, or those living in rural or infrastructurally constrained regions, the shift toward digital payments does not represent enhanced choice but rather **a narrowing of accessible options**. What was once a universally usable medium of exchange is now increasingly dependent on the possession of a smartphone, a stable internet connection, and the ability to navigate proprietary interfaces.

From a constitutional and monetary-law perspective, this is a significant departure from the traditional understanding of a currency as a *going concern*. A functioning legal tender presupposes **general acceptability**, not merely in theory but in everyday practice. Yet the euro in its physical form no longer enjoys such universality. The absence of statutory obligations on merchants to accept cash, combined with the absence of a positive right for citizens to use it, means that the freedom to choose sovereign money is increasingly symbolic rather than substantive.

This asymmetry is precisely what the ECB identifies as a structural vulnerability. As cash declines and digital payments become the default, the euro risks drifting into a hybrid regime in which **sovereign money exists formally but not functionally**, while private infrastructures determine the real modalities of exchange. The digital euro is therefore not merely a technological innovation but a constitutional corrective: a means of restoring the universality of sovereign money in a digital economy where the traditional guarantees of legal tender no longer operate effectively.

Security considerations

Innovative Security Features for Future Euro Banknotes: An Integrative Approach

The evolution of Euro banknotes presents a unique opportunity to combine advanced security technologies with cultural, historical, and ecological narratives, thereby transforming the note from a purely transactional instrument into a medium of symbolic and educational engagement. In this context, the deployment of innovative holographic, watermark, and polymer-based elements can both enhance anti-counterfeiting measures and reinforce the thematic motifs associated with each denomination.

1. Advanced Holographic Applications

Holographic elements, beyond their conventional metallic strip use, can be employed to convey depth, dynamism, and narrative richness. Multi-layered three-dimensional holograms could display different motifs depending on the viewing angle—for instance, a European bison or Michelangelo's *Uomo* could sequentially appear as the note is tilted. Interactive holograms incorporating micro-movement or light-sensitive color-shifting effects can enhance both security and visual storytelling. Furthermore, embedding symbolic motifs such as Europa or Sagrada Família within holographic devices allows the integration of cultural content into functional security features.

2. Watermarks with Multi-dimensional Effects

Watermarks may evolve from static images to more complex, multi-dimensional representations. Layered or relief watermarks can create a sense of depth, such as depicting a bison within a stylized European landscape. Color-shifting watermarks, which alter hue under changing light conditions, and hidden narrative watermarks,

featuring fine-line representations of cultural, natural, or historical symbols, provide both enhanced security and supplementary educational value.

3. Transparent and Semi-transparent Polymer Windows

Polymer banknotes enable the use of transparent or semi-transparent windows incorporating micro-printed symbols or holographic imagery. Such see-through elements, combined with microtext inscriptions of historical or linguistic significance, reinforce authenticity while promoting awareness of Europe's rich cultural and natural heritage.

4. Augmented Reality (AR) Features

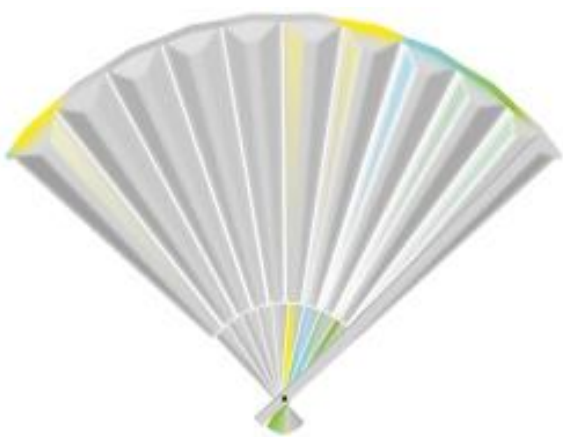
AR-readable features can transform the banknote into an interactive platform. Citizens using smartphones or AR devices could visualize animated representations of motifs, such as Michelangelo's *Uomo* or the European bison in its natural environment. This integration creates an educational interface that communicates the narratives underlying Europe's shared heritage while simultaneously providing a sophisticated anti-counterfeiting mechanism.

5. Micro-optical and Kinetic Effects

Optically variable devices (OVDs) and kinetic motifs, which change shape, color, or depth based on the angle of observation, further increase the technical difficulty of counterfeiting. Kinetic representations of dynamic elements, such as moving water over stylized European rivers, can symbolically reinforce ecological narratives embedded in the banknote design.

Features: Case study The Australian Dollar

Australian banknotes constitute a carefully integrated system in which security, materiality, and cultural symbolism intersect to produce both functional and representational effects. The polymer substrate, incorporating a transparent window, operates as a core anti-counterfeiting measure that simultaneously defines the tactile and visual character of the note. Within this window, images such as native fauna or symbolic motifs are embedded, creating a layered aesthetic that is difficult to replicate while simultaneously asserting a sense of national identity. Dynamic security elements—including rolling colour effects, three-dimensional devices, and reversing numerals—introduce kinetic visual cues that enhance both the perceptual distinctiveness and authenticity verification of the notes.



Microprinting and fine-line background patterns contribute additional complexity, serving as high-resolution security features while embedding textual and graphical narratives derived from Australian culture and literature. Raised intaglio printing further enhances the tactile legibility of denominations and establishes a perception of craftsmanship and authority. Complementary measures, such as ultraviolet fluorescent inks and see-through registers, provide concealed verification methods that engage both optical and haptic modes of interaction.

Tactile elements along the note edges additionally facilitate denomination identification for visually impaired users, underscoring the functional inclusivity of the design.

Concurrently, Australian banknotes operate as cultural artefacts. Portraits of prominent figures from literature, science, and public life, alongside representations of native flora and fauna and scenes of historical and contemporary life, articulate a visual narrative that situates the modern state within its ecological, cultural, and technological contexts. These design choices produce an object that is at once highly secure, immediately legible, and symbolically resonant, exemplifying the convergence of aesthetic, functional, and national imperatives in contemporary currency design.



Source: <https://banknotes.rba.gov.au/banknote-features/explore/>

The current series of Australian banknotes exemplifies an integration of security, functionality, and cultural representation, achieved through twelve interrelated features.

Polymer Substrate and Clear Window. The polymer substrate represents a critical technological innovation in contemporary banknote design. Unlike conventional cotton-based paper, polymer provides superior durability, resistance to environmental degradation, and enhanced longevity, reducing both the physical and economic costs of circulation. The incorporation of a continuous transparent window within the polymer structure serves multiple purposes. Functionally, it enables the embedding of sophisticated security devices—such as three-dimensional motifs, microtext, and colour-shifting elements—that are extremely difficult to replicate. Visually, the window creates a distinctive aesthetic that signals modernity and high-tech sophistication. Tactilely, it contributes to the user’s perception of authenticity, as the smooth, integrated window contrasts with raised intaglio elements elsewhere on the note. By combining material innovation with embedded optical features, the polymer substrate and window collectively establish the note’s primary resistance to counterfeiting while also reinforcing its perceptual and symbolic distinctiveness.



Iconographic and Cultural Design Elements. Beyond functional security, Australian banknotes serve as semiotic artefacts, embedding narratives of national identity, history, and ecology. Portraits of prominent Australians—spanning literature, science, public service, and exploration—are juxtaposed with native flora, fauna, architectural references, and historical vignettes, creating a multilayered visual narrative. These motifs

not only confer recognisability and aesthetic appeal but also situate the banknotes within the socio-cultural context of the nation, linking material currency to collective memory and civic identity. The integration of native species and ecological imagery foregrounds Australia's distinctive natural heritage, while depictions of cultural and historical subjects underscore continuity, innovation, and achievement.

As such, iconographic and cultural features transform the banknote from a purely transactional object into a communicative medium, simultaneously performing functional, pedagogical, and symbolic roles.

Other security features—including rolling colour effects, reversing numerals, microprinting, intaglio, see-through registers, fluorescent inks, kinetic animal motifs, and tactile denomination markers—operate in concert with these material and semiotic elements to produce a banknote that is simultaneously secure, legible, and culturally resonant. Collectively, the twelve features of Australian banknotes exemplify a synthesis of technological sophistication, perceptual clarity, and semiotic richness, establishing the currency as both a secure financial instrument and a medium of national narrative.

Integration of Security and Narrative

By combining these advanced features, future Euro banknotes can simultaneously:

1. Ensure robust protection against counterfeiting.
2. Function as cultural and educational artifacts, reflecting Europe's natural, artistic, and historical legacy.
3. Engage citizens in interactive experiences, embedding shared continental narratives within everyday transactions.

This integrative approach positions the Euro not only as a stable financial instrument but also as a vehicle for European identity, heritage, and public education, marrying technical innovation with symbolic and pedagogical intent. Implications of Advanced Security and Narrative Integration for Euro Coinage.

While banknotes provide a versatile platform for complex security features such as holograms, watermarks, and augmented reality, coinage presents both constraints and opportunities that must be addressed in the design of the future Euro system. Coins, due to their metallic composition, smaller size, and longer circulation lifespan, require security and design strategies that differ from those of paper or polymer banknotes. Nonetheless, the integration of narrative, symbolism, and technical innovation can be achieved effectively.

In terms of material and production, coins must remain physically resilient over long periods of circulation. Drawing on Swiss and Dutch best practices, alloys and production techniques can be optimized for both longevity and environmental sustainability. Multi-metallic and bi-metallic structures, as already used for €1 and €2 coins, can be further developed to incorporate micro-patterns, subtle color variations, or relief designs. These elements serve both as anti-counterfeiting measures and as narrative devices conveying cultural or historical meaning.

BTW: The word **“holographic”** derives from the Greek roots **“holo-”** meaning “whole” and **“-graphic”** meaning “writing” or “drawing.” Literally, it signifies “whole writing” or something entirely written. In legal contexts, a holographic document is one that is completely handwritten by its author. In science and technology, it describes methods of recording light to create 3D images called holograms. Overall, it conveys the idea of fully representing the whole, whether in text or in visual form.

Limited but strategic technological innovations can further augment security. Modern laser etching and color-application techniques allow the embedding of small, durable holographic or color-shifting elements, particularly in higher denominations such as the €1 and €2 coins. Central banks may also issue commemorative or annual coins per member state, featuring unique cultural or historical motifs. This approach balances Union-wide cohesion with the expression of national identity and heritage. Europe has many cultural layers such as Celtic, Minoan, Etruscan that are immensely important for European culture regionally. There are Linearbandkeramik, cucuteni and Atlantic megalithic Europe. Could they be integrated into the security features of the holographic

running across the new Eurobills? Or are they better represented in smaller denominations? Or should we stick to Leonardo Da Vinci Vitruvan Man in this singularity age?

In conclusion, although coins face physical and technological constraints relative to banknotes, careful attention to material selection, engraving, edge lettering, and selective technological enhancements allows them to function as secure, durable, and symbolic objects. Together with the narrative-driven banknotes, this approach ensures that the Euro serves not only as a medium of exchange but also as a platform for European identity, heritage, and education, while maintaining robust anti-counterfeiting measures.

The decision to discontinue the €500 banknote represents one of the most symbolically charged and structurally consequential interventions in the history of the euro. Officially, the European Central Bank justified the withdrawal on the grounds that the high-denomination note was disproportionately used in illicit activities, particularly in money laundering, organised crime, and the financing of terrorism. This stated rationale framed the €500 note as an instrument whose very materiality — its capacity to concentrate large value in a compact, easily transportable form — rendered it incompatible with the evolving security architecture of the European Union. In this official narrative, the note's removal was a pragmatic response to empirical risk, a necessary recalibration of the currency to contemporary threats, and a gesture of alignment with global trends in the reduction of high-value cash instruments.

Yet beneath this formal explanation lies a deeper, more complex set of unstated motivations that reveal the shifting priorities of European monetary governance. The withdrawal of the €500 note must be understood not merely as a security measure but as part of a broader transformation in the relationship between citizens, states, and money. At an institutional level, the decision reflects a growing commitment to [financial traceability](#), a recognition that the anonymity of large-denomination cash undermines the regulatory and supervisory capacities of the Union. The €500 note enabled the silent movement of wealth across borders, insulated from the oversight mechanisms that define the contemporary European financial order. Its disappearance therefore marks a decisive step toward a more transparent, monitored, and integrated monetary environment.

Equally significant is the influence of intelligence and law-enforcement agencies, whose assessments of the €500 note's role in criminal networks shaped the political climate surrounding its withdrawal. Although rarely acknowledged in official communications, these agencies consistently identified the note as a preferred medium for covert transactions, corruption payments, and tax evasion. The removal of the €500 note thus served as a quiet concession to the operational needs of security institutions, embedding their priorities within the symbolic and material fabric of the currency.

The decision also reflects the EU's gradual transition toward a [digital-first monetary ecosystem](#). As electronic payments become dominant and the prospect of a digital euro gains institutional momentum, the continued existence of a high-denomination physical note appeared increasingly anachronistic. Its withdrawal can therefore be read as a preparatory move — a clearing of conceptual space for a future in which monetary value circulates through infrastructures of data rather than paper. In this sense, the €500 note was not merely removed; it was rendered obsolete by the very trajectory of European monetary modernisation.

Another unstated rationale concerns the management of the shadow economy, particularly in regions where cash-based transactions remain prevalent. High-value notes facilitate unreported labour, informal markets, and cross-border cash hoarding. While politically sensitive, the withdrawal of the €500 note implicitly targeted these practices, signalling a commitment to fiscal discipline and regulatory coherence across the Union. The measure also served to limit the possibility of rapid, unmonitored capital flight during periods of financial instability, thereby strengthening the ECB's capacity to implement monetary policy, including unconventional tools such as negative interest rates.

Finally, the withdrawal carried a powerful symbolic dimension. The €500 note had long been associated with opacity, excess, and the subterranean flows of global finance. Its removal allowed the ECB to project an image of institutional vigilance and moral seriousness, demonstrating responsiveness to public concerns about corruption and security. In this way, the decision functioned as a form of [symbolic governance](#), reinforcing the legitimacy of the euro at a moment when trust in European institutions was under strain.

Taken together, the stated and unstated reasons for discontinuing the €500 banknote reveal a convergence of security imperatives, monetary strategy, political optics, and technological evolution. The decision marks a shift from a cash-heavy, anonymity-tolerant monetary order toward one characterised by transparency, digital integration, and systemic oversight. It is not merely a technical adjustment but a redefinition of what money is allowed to be within the European project — a recalibration of the balance between privacy and control, mobility and regulation, individual autonomy and collective security. In this sense, the disappearance of the €500 note is less an ending than a signal of the emerging architecture of European monetary life.

Watermarks and holographic bands are foundational elements in modern banknote design, serving not only as security features but also as tools for creating multidimensional visual and tactile experiences. These components allow currency designers to layer meaning, aesthetics, and functionality in ways that engage users across multiple sensory and cognitive dimensions.

Watermarks are embedded during the papermaking process, making them an integral part of the substrate rather than a printed overlay. This gives them a unique depth and translucency that cannot be replicated by surface printing. Their multidimensionality arises from several factors. Multitone watermarks can depict complex portraits or symbols with subtle shading, creating the illusion of depth and realism. When held up to light, watermarks reveal hidden images or patterns, inviting the user to actively verify the note's authenticity. Advanced watermark variants, such as Pixel and HighLight watermarks, can be combined with printed elements to produce hybrid visual effects that shift depending on the viewing angle and light source. In this way, watermarks function not only as security devices but also as aesthetic and interactive components that reinforce the legitimacy and sophistication of the banknote.

Holographic bands, also known as diffractive optically variable image devices (DOVIDs), are foil-based elements that produce dynamic visual effects through light diffraction. Their multidimensionality is evident in the way they respond to motion and light. As the viewing angle changes, the hologram reveals different images, colors, or animations, creating a kinetic experience that engages the user's perception. Designers can embed multiple motifs—national emblems, numeric denominations, microtext—within a single holographic band, each visible under different conditions. These bands serve both as high-level security features and as visual storytelling devices, transforming the banknote into a multisensory object that combines light, texture, and movement.

Together, watermarks and holographic bands enable banknotes to operate on several levels. They provide overt and covert security features that are difficult to counterfeit. They contribute to the visual sophistication of the note, enhancing its aesthetic appeal. They invite user interaction—tilting, holding to light, touching—which reinforces trust and familiarity. They also allow designers to embed cultural, historical, or symbolic content in ways that unfold gradually as the user engages with the note. This multidimensionality is essential in modern banknote design, where the goal is not merely to prevent forgery but to create a trusted, meaningful, and visually compelling object that reflects national or supranational identity.

Integrating Watermarks and Holographic Bands into Future Euro Design Narratives

If the next generation of euro banknotes is to weave together culture, personalities, and nature in a coherent symbolic system, the watermark and the holographic band become essential instruments for structuring that narrative. These features are not merely security devices; they are spatial and optical layers that allow the banknote to unfold its meaning gradually, revealing different aspects of the design depending on how the user interacts with the note. Their capacity for translucency, depth, motion, and optical variability makes them ideal for expressing the hierarchical relationships between cultural motifs, historical figures, and natural imagery.

When culture forms the primary layer of the design, the watermark can serve as the subtle anchor that ties the cultural theme to a specific human presence. Because watermarks possess a soft, sculptural quality, they are well suited for portraits rendered in a neutral, non-heroic style. A cultural theme—such as European literature, music, science, or philosophy—could dominate the printed surface of the note, while the watermark introduces the personality associated with that domain. The holographic band then becomes the dynamic element that connects culture to nature. Its shifting colors and kinetic imagery can evoke natural cycles, celestial motifs, or ecological

patterns that complement the cultural theme without overwhelming it. In this configuration, the watermark provides the quiet human dimension, while the holographic band supplies the living, environmental context.

If the sequence begins instead with personalities, the roles of the watermark and holographic band shift accordingly. The watermark becomes the intimate, almost contemplative space in which the individual is presented. Its translucency and tonal subtlety allow the portrait to appear as though it is emerging from within the paper itself, suggesting that the figure belongs to a shared European heritage rather than to any single nation. The printed design surrounding the watermark can then elaborate the cultural movement or intellectual tradition associated with the individual. The holographic band, with its capacity for motion and optical transformation, becomes the bridge to nature. It can depict abstracted natural forms—waves, leaves, constellations, geological textures—that respond to light and movement, reminding the user that Europe's cultural and intellectual history is inseparable from its landscapes and ecosystems. In this arrangement, the watermark humanizes the note, the printed design contextualizes it culturally, and the holographic band situates it within the natural world.

In both sequences, the watermark and holographic band allow the banknote to operate on multiple perceptual levels. The watermark invites the user to hold the note to the light, revealing the human presence embedded within the cultural or natural narrative. The holographic band encourages the user to tilt the note, activating a kinetic dimension that reinforces the thematic content. These interactions create a layered experience in which the meaning of the banknote is not static but unfolds through touch, light, and motion. This multidimensionality is particularly valuable for a currency like the euro, which must speak to a diverse population while maintaining a coherent supranational identity.

By integrating culture, personalities, and nature through the complementary roles of the watermark and holographic band, future euro banknotes can achieve a richer symbolic depth than the current series. They can become objects that not only secure transactions but also express the intellectual, cultural, and ecological heritage of Europe in a way that is subtle, interactive, and resonant.

Environmental Considerations

From an academic perspective, the sustainability of euro banknotes and coins encompasses environmental, economic, and operational dimensions, reflecting the priorities of central bankers, policymakers, and citizens. The European Central Bank and national central banks approach sustainability primarily through the lens of **material longevity, cost-efficiency, and lifecycle management**. Banknotes are increasingly produced on cotton-based substrates augmented by polymer elements, enhancing durability and reducing the frequency of replacement. Coins employ bi-metallic or alloyed compositions, such as Nordic gold, which resist corrosion and mechanical wear. Central bankers evaluate these material choices not only in terms of durability but also in terms of the energy and resource intensity of production, transportation, and recycling, seeking a balance between secure, functional currency and environmentally responsible practices. Longer-lasting notes and coins reduce the cumulative environmental footprint by decreasing the need for frequent reminting or reprinting, thus mitigating the embedded energy and resource costs associated with currency circulation.

From a policymaker's standpoint, sustainability is intertwined with **regulatory, fiscal, and strategic considerations**. Policymakers must ensure that euro currency issuance aligns with broader European Union sustainability objectives, including carbon neutrality and resource efficiency. This entails fostering harmonization in material standards across member states, optimizing production processes, and facilitating recycling schemes for worn banknotes and coins. The governance framework must also consider social sustainability: the currency should remain accessible and usable for all citizens, including visually impaired individuals, while retaining integrity and security. Decisions on retiring low-denomination coins, as debated in several member states due to their high production cost relative to face value, illustrate the trade-off between financial, environmental, and practical sustainability considerations.

From a citizen's perspective, sustainability encompasses **perceived durability, usability, and confidence in the currency**. Citizens benefit from banknotes and coins that resist rapid degradation, retain visual clarity, and maintain tactile and aesthetic qualities over extended circulation. Public engagement and transparency regarding the materials and production methods used in euro currency can reinforce a sense of collective responsibility and trust in the currency system. Moreover, citizens' use of coins and notes affects circulation patterns and the lifespan of currency, creating a feedback loop wherein responsible handling contributes to overall sustainability.

Empirical studies underscore that the euro currently achieves a moderate to high level of material sustainability relative to other major currencies. The lifespan of higher-denomination notes, such as the €50 and €100, typically exceeds a decade, while the 1 € and 2 € coins, due to bi-metallic construction, remain in circulation for up to thirty years. Lower-denomination coins, however, face accelerated corrosion and wear, reducing their effective sustainability. These observations suggest that further technological innovation, such as the introduction of polymer or hybrid alloys for lower denominations, could enhance the overall ecological and economic sustainability of euro currency.

In conclusion, from a central banker's viewpoint, sustainability is a function of durability, lifecycle cost, and resource efficiency. From a policymaker's standpoint, it is an integrated challenge involving environmental targets, social accessibility, and fiscal prudence. From the citizen's perspective, sustainability is measured in usability, longevity, and confidence in the currency. The euro's banknotes and coins currently reflect a high degree of technical sophistication and operational sustainability, though continued innovation in materials and design, particularly for lower-denomination coins, is essential to reinforce its status as a secure, economically efficient, and environmentally responsible currency system.

Governance Aspects of Monetary Security

Monetary security can be defined as the condition in which a monetary system reliably preserves value, enables trusted exchange, and sustains political and social order across time, technological change, and geopolitical stress. It sits at the intersection of economics, sovereignty, material culture, and security studies, extending beyond price stability to encompass trust, durability, legitimacy, and resilience.

Dimensions of monetary security.

At its core, monetary security has an institutional dimension, referring to the credibility and capacity of issuing authorities—central banks, treasuries, mints—to govern money consistently, transparently, and independently. A second dimension is material and technological, covering the physical substrates of money (paper, polymer, metal, digital code), their resistance to counterfeiting, degradation, and systemic failure. A third dimension is financial and macroeconomic, linked to inflation control, convertibility, liquidity provision, and crisis management. A fourth dimension is geopolitical, where currency systems are exposed to sanctions, extraterritorial power, reserve currency competition, and monetary fragmentation. Finally, there is a societal and symbolic dimension: money must be socially accepted, culturally legible, and perceived as fair in distribution and access.

Appearance.

The appearance of money is not ornamental but functional to monetary security. Visual design, iconography, typography, colour, and tactile features communicate authority, continuity, and authenticity. Banknotes and coins encode narratives of statehood, technological competence, and collective memory, while security features—watermarks, holograms, microprinting, variable inks—make trust materially visible. In digital forms, “appearance” shifts toward interface design, cryptographic assurance, and user experience, where clarity, auditability, and perceived safety substitute for physical cues.

Reincarnations.

Monetary security repeatedly reincarnates as monetary forms evolve. Metallic standards gave way to paper promises; commodity backing yielded to fiat authority; national currencies became embedded in supranational systems; and now physical money coexists with digital payments, central bank digital currencies, and tokenised assets. Each reincarnation preserves the same underlying objective—trusted value and exchange—while reconfiguring the mechanisms of security. Crucially, new forms do not erase older ones; instead, layered systems emerge, in which cash, bank money, and digital instruments mutually stabilise one another.

Occurrences.

Monetary security becomes most visible when it is threatened or reasserted. It surfaces during inflationary episodes, banking crises, sovereign defaults, currency reforms, and geopolitical conflicts, as well as during deliberate acts of redesign such as new banknote series, currency unions, or the launch of digital legal tender. Everyday occurrences are more subtle: the smooth circulation of cash, the acceptance of payments without friction, and the absence of doubt about tomorrow's value. In this sense, monetary security is paradoxical—it is most successful when it remains largely unnoticed.

Taken together, monetary security is not a static property but a continuously maintained condition, reproduced through institutions, material forms, design choices, and political authority. It is as much about confidence and symbolism as it is about economics and technology, and its endurance depends on the capacity of monetary systems to adapt without losing legitimacy.

Cross-tab: Monetary Security Dimensions × Theoreticians

Dimension of Monetary Security	Core Concern	Key Theoreticians / Traditions	Contribution to Monetary Security Thinking
Institutional Governance	Credibility, authority, rule-based issuance, independence	Max Weber; Douglass North; Walter Bagehot; Central Banking Tradition (Goodhart)	Money as an institution grounded in legal authority and bureaucratic legitimacy; lender-of-last-resort as security mechanism
Macroeconomic / Financial Stability	Inflation control, liquidity, crisis containment	John Maynard Keynes; Hyman Minsky; Milton Friedman	Money as a stabilisation tool; security threatened by cycles, leverage, and expectations
Material Technological	Durability, anti-counterfeiting, system robustness	Georg Simmel; Bruno Latour; Science & Technology Studies (STS)	Money as a socio-technical artefact; trust embedded in materials, devices, and infrastructures
Symbolic Cultural	Legitimacy, collective belief, identity	Georg Simmel; Pierre Bourdieu; Benedict Anderson	Monetary security rests on shared belief, symbolic capital, and imagined community
Geopolitical Strategic	Currency power, sanctions, reserve status	Susan Strange; Robert Mundell; Barry Eichengreen	Money as structural power; security shaped by hierarchy between currencies
Legal Constitutional	Sovereignty, legal tender, monetary order	Carl Schmitt; Hans Kelsen; Constitutional Political Economy	Control over money as a core sovereign competence
Social Distributional	Access, inequality, social cohesion	Karl Polanyi; Thomas Piketty; Amartya Sen	Monetary insecurity emerges when money undermines social embeddedness
Design Appearance	Trust signals, recognisability, continuity	Jacques Derrida; Design Theory; Semiotics (Eco)	Visual and tactile features as stabilisers of trust and authority
Digital Informational	Cyber resilience, data integrity, programmability	Friedrich Hayek (denationalisation); Cryptography tradition; CBDC literature	Monetary security redefined through code, encryption, and platform governance
Crisis Exceptionalism	Emergency powers, suspension of norms	Carl Schmitt; Keynes; Crisis Governance literature	Monetary security is reasserted through extraordinary measures

Analytical Observations

- Dual foundations:** Monetary security consistently oscillates between *material-technical* foundations (paper, metal, code) and *symbolic-institutional* foundations (authority, belief, legitimacy).

2. **Security through trust, not force:** Unlike military security, monetary security depends on voluntary acceptance—making perception, design, and narrative central.
3. **Crisis as revelation:** Most theorists converge on the idea that monetary security becomes intelligible only in moments of breakdown.
4. **Layered continuity:** From Simmel to digital-currency theorists, money is seen less as a single object than as a layered system reproducing trust across forms.

The 2028 changeover of euro banknotes, combined with the deliberate continuity of euro coins, should be understood as a moment of monetary security consolidation rather than a routine technical update. Within ongoing ECB debates on trust, resilience, and the future coexistence of cash and digital money, the changeover constitutes a practical test of whether the Eurosystem can simultaneously innovate and reassure. The credibility of the euro does not rest solely on price stability but on the visible capacity of its institutions to manage change without destabilising expectations.

From an institutional perspective, the redesign highlights a persistent tension in ECB governance between decentralised execution by national central banks and the need for a unified narrative of authority. While the Eurosystem's operational pluralism has historically been a strength, the changeover risks revealing coordination gaps if communication, rollout timing, or security standards diverge across jurisdictions. A constructively critical reading of current ECB practice suggests that institutional coherence is still treated as an operational matter rather than as a core dimension of monetary security. The changeover would benefit from being framed explicitly as a system-wide security operation, thereby elevating coordination, narrative discipline, and accountability to the strategic level.

Material and technological choices in the new banknotes intersect directly with ECB debates on resilience and sustainability. Enhanced durability, recyclability, and machine readability improve long-term cost efficiency and security, yet the ECB has tended to present these features primarily as technical improvements. A more security-oriented framing would recognise material robustness as a stabilising asset in crisis scenarios, including cyber disruptions or payment system outages. The contrast with euro coins is instructive: their material stability and long life cycles provide a physical anchor that reinforces trust precisely because they change slowly. This asymmetry between innovative banknotes and stable coins should be recognised as an intentional design of layered resilience rather than as an incidental outcome.

Symbolism and visual language occupy an ambiguous position in ECB discourse, often acknowledged but rarely theorised as instruments of trust. The new banknote themes seek to express shared European values while avoiding overt political symbolism. This restraint is appropriate, yet it also risks underestimating the security function of recognisable continuity. Excessive abstraction or rapid aesthetic shifts could weaken the intuitive legibility of the currency, particularly among older users or in cross-border cash circulation. A constructively critical implication for the ECB is that design governance should be treated as a form of risk management, subject to testing and evaluation in the same way as security features or payment infrastructures.

Macroeconomically, the ECB is correct to emphasise that a banknote changeover is neutral with respect to inflation. However, ECB experience since the original euro introduction demonstrates that perception effects can diverge sharply from measured outcomes. In the current environment of heightened price sensitivity, even a technically flawless changeover could amplify public doubts if communication is reactive rather than anticipatory. This points to a broader challenge in ECB strategy: the gap between analytical certainty and social perception. Monetary security depends on bridging that gap, not dismissing it.

The geopolitical dimension of the changeover remains underdeveloped in ECB debate. Physical euro banknotes circulate well beyond the euro area and function as stores of value in neighbouring regions. A credible redesign strengthens the euro's external trust profile, while any visible confusion or contestation would weaken it. From a strategic perspective, the ECB could treat the changeover as a moment of reaffirmation of the euro's international role, without politicising the currency or overstepping its mandate.

Finally, the timing of the changeover alongside discussions on a digital euro creates both opportunity and risk. If not carefully framed, the redesign could be interpreted as a transitional step toward the marginalisation of

cash. Such an interpretation would contradict the ECB's own position that cash remains a cornerstone of monetary sovereignty and inclusion. The constructive challenge for the ECB is therefore to articulate a clear doctrine of complementarity, in which redesigned banknotes and enduring coins form the physical backbone of a dual monetary system rather than a legacy technology awaiting replacement.

In sum, the 2028 euro banknote changeover should be treated within ECB debates as a comprehensive monetary security exercise. Its success will depend less on the sophistication of individual features than on the coherence with which institutional authority, material resilience, symbolic continuity, and public perception are aligned. A more explicit recognition of these interdependencies would strengthen the ECB's capacity to manage not only this transition but future transformations of the euro's monetary ecosystem.

Monetary Security Applied to the 2028 Euro Banknote Changeover

The 2028 euro banknote changeover is not merely a technical redesign but an institutional stress test of ECB authority and Eurosystem coordination. A smooth transition reinforces the ECB's role as the ultimate guarantor of value and continuity, while misalignment between national central banks, mints, and public communication would weaken perceived cohesion.

Implication:

Monetary security depends on a *single, coherent narrative* of continuity across all euro area states, avoiding any perception of fragmentation or nationalisation of the redesign process.

Policy recommendation:

Establish a **Euro Monetary Security Steering Group** (ECB–NCB–Mint–Commission) with formal responsibility for timing, messaging, and security coherence across banknotes and coins.

Material and Technological Dimension

The redesign introduces upgraded substrates and security features while maintaining familiarity. This is a moment where trust is materially re-encoded: durability, recyclability, machine readability, and resistance to counterfeiting become security assets rather than cost items.

Coins, by contrast, remain materially stable, anchoring the tactile and physical memory of the euro.

Implication:

The asymmetry—new banknotes versus stable coins—creates a *layered security architecture*, where coins act as continuity anchors and banknotes as innovation carriers.

Policy recommendation:

Formally recognise **coins as long-term continuity instruments** in ECB documentation and integrate coin circulation data into monetary security assessments, not only banknote metrics.

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Institutional Perspective

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Geopolitics

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Modernising Euro Coinage: Policy Options and Design Considerations

The euro coin series, spanning denominations from one euro cent to two euro, forms a fundamental component of the European Union's cash infrastructure. Although the basic designs have remained largely unchanged since their introduction in 2002, evolving technological, economic, and societal conditions have renewed interest in the potential modernisation of the coinage system. This analysis outlines the principal dimensions through which euro coins may be updated, drawing on contemporary developments in monetary design, public policy, and Eurosystem strategy.

If the Euro dual-design structure consisting of a common European side and a national side selected by each issuing Member State is maintained, this doesn't mean in the alternative that no changes should be introduced. EU regulations allow Member States to revise their national designs at intervals of approximately fifteen years, and recent redesigns—such as France's updated motifs in 2024—demonstrate the feasibility of such changes. Modernisation of national sides may involve the adoption of contemporary artistic styles, the inclusion of updated national symbols, or the representation of themes such as sustainability, scientific innovation, or European integration. These revisions serve not only aesthetic purposes but also reinforce national identity within a shared monetary framework.

Although euro coins are less vulnerable to counterfeiting than banknotes, technological progress provides opportunities to strengthen their security profile. Potential enhancements include the use of micro-engraving, more complex bi-metallic structures, refined edge inscriptions, and machine-readable elements compatible with vending and payment systems. Such measures parallel the European Central Bank's ongoing efforts to improve the security of euro banknotes and contribute to the overall integrity of cash transactions across the euro area.

Sustainability has become a central priority in the ECB's broader cash strategy, and similar principles can be applied to coinage. Modernisation efforts may involve the adoption of metal alloys with lower environmental impact, increased use of recycled materials, and improvements in minting processes that reduce energy consumption. Surface treatments that extend the lifespan of coins could further reduce the need for frequent replacement. These measures align with the EU's environmental objectives and may also lower long-term production costs.

Euro coins already incorporate differences in size, weight, and edge texture to support users with visual impairments, yet further improvements could enhance accessibility. More pronounced tactile distinctions between denominations, clearer edge patterns, and stronger colour contrasts achieved through updated alloys or coatings would contribute to a more inclusive cash system. Such adjustments reflect the ECB's commitment to ensuring that cash remains universally usable.

The future of the one- and two-cent and five cent coins remains a subject of ongoing policy debate. Their production costs often exceed their face value, and their practical utility in daily transactions is limited. Modernisation options include phasing out the lowest denominations, introducing EU-wide rounding rules for cash payments, and conducting impact assessments on consumer prices and payment behaviour. Any reform in this area would require political consensus among euro-area Member States.

Although still largely conceptual, emerging technologies may influence future coin design. Possible developments include embedded machine-readable markers for automated authentication, enhanced compatibility with digital vending and payment systems, and experimental applications of near-field communication technologies. While these innovations are not currently part of EU policy, they reflect broader global trends in currency modernisation.

Revising the common side of euro coins would require agreement among all euro-area Member States. A redesign could update the map of Europe to reflect political changes, introduce contemporary graphic design standards, or emphasise themes such as European unity, cultural heritage, or ecological transition. Such a redesign would symbolically reaffirm the shared identity of the euro area.

Modernising euro coinage involves a multidimensional set of considerations, including aesthetics, security, sustainability, accessibility, and economic efficiency. While some reforms—such as updating national designs—can be implemented unilaterally by Member States, others require coordinated action at the EU level. As the Eurosystem continues to evaluate the future of cash, the renewal of euro coins represents an opportunity to align physical currency with contemporary technological and societal expectations.

Summary

The 2028 euro banknote changeover should be treated as a **monetary security operation**, not a design refresh. Its success depends on:

- Institutional unity

- Material robustness
- Symbolic legitimacy
- Perception management
- Digital coexistence

Handled correctly, the changeover will **reassert the euro as a stable, modern, and sovereign currency** in both physical and geopolitical terms. Mishandled, it risks amplifying doubts at a moment of global monetary fragmentation.

Intersections

The stability of the euro and the broader EU monetary system relies not only on the strength of individual institutions but on the intersections between them. Citizens, the ECB, the Council, the European Parliament, the Commission, member states, eurozone members, and external trading partners form a complex network of mutual dependencies. These intersections define how value is preserved, how exchange is trusted, and how political and social order is sustained across time and crisis. No single actor can ensure monetary security in isolation; legitimacy, durability, and resilience emerge from coordinated action and perception alignment. For example, the ECB's monetary authority is reinforced by public acceptance and oversight mechanisms provided through Parliament and citizen engagement. National member states contribute operational and fiscal coordination, but their effectiveness depends on shared eurozone governance frameworks and compliance with EU-level rules. The Council and Eurogroup provide essential consensus-building, linking individual state interests to collective policy execution. The European Commission acts as a mediator, translating policy frameworks into enforceable actions that bind both national and supranational actors. Eurozone members collectively create a layer of systemic durability, where shared adherence to rules underpins both domestic and external trust in the currency. Trading partners interact with the system externally, their confidence amplifying the euro's legitimacy on global markets. Intersections also reveal potential points of fragility: misaligned communication, conflicting priorities, or inconsistent implementation can compromise trust even if individual actors perform competently. These interaction points are crucial during technological or geopolitical shocks, where coordination between digital infrastructure management, public perception, and institutional authority determines resilience. The design and circulation of euro banknotes and coins exemplify these intersections in material form, linking technical durability to public and institutional trust. Ultimately, the euro's security is an emergent property of these overlapping responsibilities and mutual reinforcements. Recognizing and managing these intersections is therefore central to policy planning, crisis response, and long-term strategic governance. By mapping and strengthening these connections, the EU can ensure that monetary stability, trust, and legitimacy are maintained across diverse challenges and transformations.

Actor / Stakeholder	Preserving Value	Enabling Trusted Exchange	Sustaining Political & Social Order	Role in Trust, Durability, Legitimacy, Resilience
Actor / Stakeholder	Demand stability in prices and purchasing power; monitor inflation	Use cash, digital payments; participate in banking system	Support or resist policy measures; influence political stability	Provide societal legitimacy; perceive durability and fairness; their acceptance underpins system resilience
Citizens	Controls monetary policy, inflation, interest rates; manages	Ensures liquidity, payment system functioning, clearing and settlement	Maintains credibility and independence; coordinates with eurozone fiscal policies	Institutional authority; technical durability through robust operations; trust anchored in consistent policy

	currency issuance			
European Central Bank (ECB)	Approves key eurozone fiscal and regulatory frameworks	Coordinates fiscal policies between member states	Ensures collective political alignment on eurozone decisions	Legitimacy derived from political representation of states; reinforces resilience through consensus
Council of the EU / Eurogroup	Provides democratic oversight of ECB indirectly; approves financial regulations	Contributes to transparency and accountability of euro policy	Represents citizens' interests; debates systemic reforms	Enhances legitimacy and trust; political durability through debate and consent
European Parliament	Proposes eurozone budgetary rules, fiscal coordination mechanisms	Monitors compliance; facilitates cross-border exchange	Ensures policy coherence; mediates conflicts	Builds institutional resilience and systemic trust; supports durability via rule enforcement
European Commission	National fiscal policies; control of national economic levers	Facilitate domestic payment systems; supervise banks	Uphold social order through economic stability	Legitimacy at national level; resilience through compliance; trust is contingent on predictable policy alignment
Member States	Shared monetary policy adherence; fiscal discipline under Stability and Growth Pact	Integrated payment and settlement systems; cross-border clearing	Collective adherence ensures regional stability	Trust and durability enhanced through joint governance; resilience via shared frameworks
Eurozone Members	External valuation of euro; foreign reserves; exchange rate stability	Cross-border trade settlement; financial interoperability	Geopolitical relations and confidence in euro as reserve currency	Trust and legitimacy externally; resilience in crisis depends on euro credibility; durability linked to consistent international policy
Trading Partners / External Actors	External valuation of euro; foreign reserves; exchange rate stability	Cross-border trade settlement; financial interoperability	Geopolitical relations and confidence in euro as reserve currency	Trust and legitimacy externally; resilience in crisis depends on euro credibility; durability linked to consistent international policy
Organised Crime Lazarus Group	Acts to exploit or extract value through illicit means;	Facilitates informal or shadow exchanges, including	Weakens social and political order by operating outside legal	Negatively impacts trust in currency and institutions, compromises durability through counterfeit circulation, challenges legitimacy, and reduces systemic resilience.

(North Korea) Ndrangheta (Italy) Guangdong counterfeit syndicates. Czech Cell Carbanak Russia	often undermines formal economic systems.	counterfeit or fraudulent currency flows, but erodes legitimate trust networks.	frameworks and exploiting governance gaps.	
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Analytical Observations

1. **Trust is multi-layered:** Citizens' perception of value and legitimacy depends on the institutional credibility of the ECB, fiscal coordination via the Council/Eurogroup, and democratic oversight through Parliament.
2. **Durability depends on alignment:** Technical robustness of the currency (banknotes, coins, digital systems) is reinforced only if Member States, Eurozone members, and the Commission coordinate policies.
3. **Legitimacy is distributed:** Legitimacy is not centralized—it emerges from citizens' acceptance, political consensus among states, and oversight mechanisms at the EU level.
4. **Resilience is relational:** The system's ability to withstand shocks—financial, technological, or geopolitical—relies on interactions between actors, particularly in crisis coordination, and external credibility with trading partners.

The Stakes

The European Union (EU) approaches the evolving international monetary order with a set of interrelated objectives, strategic interests, and normative values, which are closely tied to the functioning and credibility of the eurozone's banknotes and coins.

Objectives: The EU seeks to preserve the euro as a stable, resilient, and internationally recognized currency capable of supporting both intra-European trade and global financial interactions. This involves safeguarding monetary stability, preventing fragmentation across the eurozone, and promoting the euro as a vehicle for international settlements and reserves. A secondary but complementary objective is to maintain public confidence in the integrity, security, and usability of euro banknotes and coins, which underpins the operational effectiveness of the single currency.

Interests: The EU's interests are both economic and strategic. Economically, a well-functioning euro enhances price stability, reduces transaction costs across member states, and strengthens the EU's bargaining position in global financial markets. Strategically, the EU is invested in shaping the emerging monetary order to prevent excessive dependence on external currencies, notably the US dollar, thereby increasing its autonomy and resilience against external shocks. Effective physical currency circulation, secure banknotes, and trusted coinage directly reinforce these interests by sustaining domestic and cross-border confidence in the euro.

Values: The EU emphasizes transparency, security, inclusivity, and legal predictability as core values in the monetary domain. This encompasses the design and production of banknotes and coins with advanced anti-counterfeiting technologies, robust governance structures for mints and central banks, and accessibility features that allow all citizens to use and trust the currency. These values reflect the EU's broader commitment to integrating economic efficiency with democratic legitimacy and societal trust.

Interconnections: The EU recognizes a strong feedback loop between the physical and institutional dimensions of the euro. Well-designed and widely trusted banknotes and coins reinforce public confidence, which in turn strengthens the euro's role in both domestic and international monetary arrangements. Conversely, disruptions

in circulation quality, security breaches, or perceived weaknesses in minting and issuance governance can undermine confidence, reduce the euro's competitiveness, and complicate the EU's engagement with the evolving global monetary order. Therefore, the EU's strategic management of the Eurozone's physical currency is inseparable from its broader objectives of monetary stability, international influence, and resilience in a multipolar financial system.

Summary

The functioning of the euro and the broader EU monetary system depends on the interplay between multiple actors, each contributing differently to the preservation of value, the facilitation of trusted exchange, and the maintenance of political and social order. Citizens are central to the system because their perception of stability and legitimacy underpins resilience; they directly experience the effects of monetary policy through prices, savings, and payments, making their acceptance of both cash and digital instruments essential for the euro's credibility. The European Central Bank (ECB) serves as the principal authority in preserving value and ensuring liquidity, providing operational and institutional stability. While its influence on political and social order is somewhat mediated, the ECB anchors trust and legitimacy through consistent policy, technical reliability, and transparent governance. The Council of the EU, including the Eurogroup, plays a dual role: it helps preserve value by coordinating fiscal policies across member states and sustains political order by building consensus and legitimising collective action, thereby reinforcing governance durability.

The European Parliament contributes mainly through democratic oversight and accountability, which enhances legitimacy and public trust, ensuring that policy choices maintain systemic resilience and social acceptance. The European Commission operates as a coordinating and enforcing body, enabling trusted cross-border exchange and systemic cohesion, while building resilience through policy harmonisation and compliance monitoring. Individual member states exercise authority over national economic levers and payment infrastructures; their consistent adherence to eurozone rules is crucial for sustaining both trust and social order, while reinforcing the durability of the system. Eurozone members collectively constitute the backbone of the monetary system; their shared governance and joint policy adherence amplify trust, reinforce operational resilience, and maintain both value and social cohesion across the union. Finally, trading partners and external actors, while less involved in internal political order, play a decisive role in external legitimacy, supporting the euro's durability and resilience on international markets and during global shocks.

Taken together, these actors form a web of intersections where value preservation, transactional trust, and political stability are mutually reinforced, illustrating that monetary security is an emergent property of coordinated governance, institutional authority, societal acceptance, and external credibility. Each intersection represents a potential point of strength or vulnerability, highlighting the importance of active coordination, clear communication, and continuous oversight in safeguarding the euro across technological, economic, and geopolitical transformations. The system's resilience relies not solely on individual competencies but on the capacity of these actors to interact predictably, align incentives, and manage perceptions, thereby ensuring the euro's long-term legitimacy, durability, and stability.

In essence, the EU's engagement with the evolving monetary order is inseparable from the practical and symbolic integrity of the euro. By aligning its strategic objectives, economic interests, and normative values with the effective functioning of banknotes and coins, the EU not only sustains domestic confidence and cohesion within the eurozone but also strengthens its position in the global financial system. The physical currency thus operates as both a tool and a signal of the EU's monetary stability, governance capacity, and strategic autonomy.

Renvoi

The euro coinage system is now more than twenty years old, and several pressures make a redesign or alternative symbolic direction not only timely but strategically necessary.

Here's the core logic:

1. **The current national designs reflect the early 2000s political moment**, not the Europe of 2025–2030. They freeze the founding narratives — unity, stability, post-Cold-War optimism — but Europe has since become more complex, more plural, and more self-aware.

2. **The common side feels increasingly outdated**, visually and conceptually. The gridded globe expresses a technocratic, inward-folding Europe. It does not reflect Europe's current geopolitical posture, ecological priorities, or cultural plurality.
3. **Other global currencies have modernised**, adopting clearer symbolism, stronger materials, and more coherent design systems. The euro risks looking like a legacy system rather than a living one.
4. **A new generation of Europeans has no memory of the euro's introduction**. Their Europe is not the Europe of 2002. The currency should speak to them, not only to the founding moment.
5. **The euro is one of the EU's few truly universal touchpoints**. Updating it is not cosmetic — it is a way of renewing the European story.

So yes: **an alternative is timely because the symbolic, material, and generational conditions have shifted**.

In the beginning, there was a fountain — not of wealth, but of possibility. A place where Europe's rivers met, where myth and mechanism, memory and motion, converged. From this source, the land unfolded in six directions, each bearing its own rhythm, its own wound, its own promise.

To the south, the **Mediterranean** bloomed in olive and amphora, sun-scorched and salt-breathed, carrying the scent of trade winds and civilizational depth. Its coin bore the curve of the wave and the spiral of the amphora — a symbol of fertility, exchange, and the long memory of the sea.

To the east, the **Balkans** rose in ridges and embroidery, a terrain of layered identity and ancestral echo. Its coin held the mountain and the thread — a motif of resilience, of things stitched and restitched, of histories that refuse to vanish.

To the center, **Central Europe** stood in gothic arch and gearwork, a fusion of tradition and precision. Its coin bore the interlock — architecture and mechanism entwined — a symbol of systemic clarity and cultural density.

To the north, **Scandinavia** whispered through pine and aurora, stark and luminous. Its coin held the vertical tree and the arc of light — a symbol of ecological clarity, introspection, and the quiet pulse of the boreal.

To the west, **Western Europe** layered itself in compass and strata, a maritime logic of navigation and sovereignty. Its coin bore the rose and the grid — a symbol of movement, mapping, and infrastructural inheritance.

To the northeast, the **Baltic** shimmered in canopy and code, a post-imperial terrain of nature and innovation. Its coin held the forest and the wave — a symbol of memory, renewal, and digital breath.

Together, these coins do not form a series — they form a **constellation**, a re-enchantment of the euro as a medium of meaning. Not what Europe is, but what it could be. Not what was undone, but what can be re-woven. A currency not of sameness, but of **differentiated coherence** — each region a fountain, each motif a spring, each coin a pulse in the body of a plural Europe.

In the fountain of possibilities, Europe does not speak with one voice — it sings in polyphony. Each region, each coin, each motif becomes a syllable in a shared grammar of difference. The **Balkans** offer the embroidery of resilience, threads pulled tight across centuries of rupture and renewal. The **Mediterranean** pours forth olive and amphora, a sunlit memory of trade, myth, and civilizational depth. **Central Europe** stands in gothic arch and gearwork, precision and legacy fused into systemic clarity. **Scandinavia** whispers through pine and aurora, vertical and luminous, a breath of ecological introspection. **Western Europe** maps itself in compass and strata, maritime and infrastructural, layered in sovereignty and movement. The **Baltic** shimmers in canopy and code, a quiet pulse of nature and innovation, post-imperial and forward-looking.

These are not fragments — they are facets. Not divisions — but dimensions. The coins do not unify by erasing difference; they unify by **orchestrating it**. Each motif is a portal, each region a rhythm, each design a declaration: that Europe's strength lies not in sameness, but in **differentiated coherence**. This is not a currency — it is a **chorus**. A constellation of forms that reweaves what was undone, that stages unity not as uniformity, but as **plural resonance**.

Manifesto For A Plural Euro

A Design Architecture For Unity In Diversity

Europe stands at a threshold. The currency that once symbolised convergence now bears the patina of an earlier era — a moment of reunification, optimism, and institutional consolidation. But the Europe of today is more layered, more plural, more self-aware. Its currency must evolve accordingly. This manifesto sets out the design logic for a **next-generation euro**, one that does not flatten difference but orchestrates it into coherence.

1. The Euro as Fountain of Possibilities

The euro must cease to be a static emblem and become a **fountain**, a generative field where Europe's regions, histories, and futures flow into one another. Each coin becomes a spring — a point where memory and possibility meet. The design language must evoke emergence, not closure; movement, not monument.

2. Unity Through Differentiated Form

Europe's strength is not uniformity but **structured plurality**. The new euro series must embody this:

- The **Balkans** as the geometry of resilience — mountains and woven threads.
- The **Mediterranean** as the curve of fertility — olive, amphora, wave.
- **Central Europe** as the interlock — gothic arch and mechanical precision.
- **Scandinavia** as vertical clarity — pine, aurora, northern minimalism.
- **Western Europe** as navigational intelligence — compass, strata, maritime logic.
- The **Baltic** as quiet innovation — forest canopy and digital pulse.

These are not decorations. They are **regional archetypes**, each expressing a facet of Europe's civilizational DNA. Could they be interwoven into the bills as watermarks or in the metallic band on the bill ?

From Monument to System

The first euro series relied on monuments, portraits, and national icons. The next must shift from **objects** to **systems**: ecological cycles, knowledge flows, cultural vectors, infrastructural rhythms. Europe is no longer defined by what it has built, but by **how it connects** — across borders, disciplines, and generations.

Reweaving What Has Come Undone

Europe's crises — financial, geopolitical, ecological — have frayed its symbolic fabric. The new euro must act as a **reweaving device**, stitching together what history has pulled apart. Not by erasing wounds, but by acknowledging them and transforming them into patterns of resilience. The coin becomes a loom, the design a thread.

Currency of Becoming

The euro must no longer depict Europe as a finished project. It must depict Europe as a **becoming** — a continent in motion, a polity in evolution, a culture in dialogue with itself. The design language should express **open trajectories**, not closed narratives; **vectors**, not verdicts.

Material as Message

The choice of alloys, relief depth, tactile markers, and edge patterns must reinforce the conceptual architecture. Durability becomes a metaphor for resilience. Tactility becomes a metaphor for accessibility. Bi-metallic contrasts become metaphors for layered identity. The material is not neutral — it is part of the story.

A Constellation, Not a Canon

The future euro series must be conceived as a **constellation** — a set of differentiated forms held together by gravitational coherence. No single motif dominates. No region is peripheral. The unity emerges from **relation**, not hierarchy.

Summary

A Europe That Speaks in Many Forms, Yet Moves as One

This manifesto proposes a euro that is not merely redesigned but **reimagined** — a currency that embodies Europe's plural soul while projecting a shared horizon. A euro that does not simplify, but synthesises. A euro that does not commemorate, but **creates**.

CONCLUSIONS

We conclude by proposing that the European Union embark on a bold and unprecedented path in the design of its future euro banknotes: a holistic integration of culture, nature, and personalities as the central guiding principle for both sides—recto and verso—of the note. This approach would not merely celebrate Europe's diversity; it would craft a narrative thread that binds the continent's heritage, creativity, and shared identity into a coherent visual and symbolic language, creating a Euro-bill that is at once innovative, emotionally resonant, and unmistakably European.

Following this conceptual innovation for banknotes, we foresee a parallel evolution of the Eurocoins. Their design would be gradually standardized across the Union, emphasizing national symbols in a complementary rather than duplicative manner relative to the banknotes. The traditional national side of coins would, in effect, be streamlined, moving toward a more unitary design that reinforces European cohesion while still allowing central banks the flexibility to issue a single, unique national coin annually. This ensures a balance between Union-wide identity and national pride, creating a platform for subtle but meaningful expressions of local heritage within a unified monetary framework.

In terms of materiality and production, we envision Eurocoins that are robust and enduring—matching the durability of the Swiss franc—economical in production akin to the Dutch approach, and environmentally sustainable in ways that set a new global standard. These coins would be not just currency, but objects of lasting value: efficient, responsible, and designed for a future where European money is simultaneously practical, iconic, and reflective of shared continental values. We admire the Australian dollar for its seamless fusion of polymer and advanced security features, which exude both innovation and elegance. The ECB must take the security features under careful study and learn from the experiences, after having tested the feel of polymer unlike the Hong Kong Dollar and Romanian Lei, both of which feel like a fad or provides a muted impression to hold onto, perhaps even give a wimpish feel compared to the cotton-based notes.

The idea is otherwise as well **not** to make change-overs every twenty years the Eurobills, albeit I concede 123:3:1 remains a universal formula.

Fundamental reform of the ECB mint is now needed. It is not only that governance must be strengthened to ensure transparency, accountability, and strategic coherence across member states, but also that operational efficiency, technological modernization, and design innovation require urgent attention. Modern banknote production demands integration of advanced security features, resilient supply chains, and sustainable materials, all coordinated within a clear institutional framework. Moreover, the mint must more effectively balance functional imperatives—such as durability, anti-counterfeiting measures, and cost efficiency—with symbolic and cultural considerations, including the representation of European identity, heritage, and diversity in currency design. Strengthening decision-making structures, clarifying lines of responsibility between the ECB and national mints, and fostering research and development partnerships will be essential to position the mint as both a secure financial instrument and a medium of European narrative. Without such reform, the mint risks lagging behind technological standards and failing to reflect the evolving values and aspirations of the Eurozone.

It is entirely unacceptable that the 1, 2 & 5 Euro cents are subject to corrosion and that the ECB bring coins to market that have lower durability than what it says it is brought to market to have. There are also differences in quality in the twenty and fifty cent coins. The 10, 20 and 50 Eurocents displays various degrees of durability irregular in-between members of the Eurozone. The One and Two Euros all seem to be of a sound quality and to last as long as promised. This is important so long as coinage are symbols, to pay with bills and coins are both a right and a daily ritual.

We also insist on a change over in two tempi concerning bills and coins and that the ECB stops making a binary choice no one else does between culture and personalities versus animals and birds, unless the point is to have animals and birds in the sound round of changeover under a EU-wide quasi unitary circulation. It is the wrong attitude and the wrong thinking.

Euro banknotes and coins are more than instruments of exchange; they are mirrors and windows, reflecting a Europe that is at once united and fragmented, ancient and modern, familiar and strange, tangible yet symbolic, ephemeral yet enduring. Every bridge arches across the paper like a whispered promise, every gateway gapes with invitation and secrecy, and twelve stars circle like vigilant sentinels over the continent's dreams and dilemmas, suggesting unity and diversity entwined, sameness and singularity dancing together in a delicate yet formidable embrace. Coins clink and clatter in pockets and machines, their common faces singing of solidarity while their national sides murmur histories, heroes, landscapes, and languages, creating a quiet clamor of identity within anonymity. Every motif, every embossed ridge, every tactile numeral carries a conversation across borders, a dialogue of culture, memory, and aspiration that is simultaneously intimate and universal, stable yet fluid, concrete yet metaphorical.

Beneath this artistry hums a complex network of security, invisible yet insistent, delicate yet indestructible. Holograms flicker and shimmer with optical tricks, emerald numbers change color with a tilt, threads wind invisibly within the fibers, microprints murmur secrets too small to decipher, and polymers or hybrid substrates endure the friction of circulation like steel nerves beneath soft skin. Coins resist imitation through bimetallic hearts, magnetic murmurs, and engraved edges, their alloys singing the faint symphony of authenticity while defying replication, an oxymoronic testament to both fragility and strength, visibility and invisibility, accessibility and protection. Every feature invites recognition and repels deception, creating a currency that is both a public tool and a private guardian, a shared object and a secretive artifact.

Thus, we expect the ECB to address the numerous challenges in relation to security that are not limited to the withdrawn 1000 Euro to be reintroduced under a European series, and to do so in a manner that is convincing to both business, policy makers and citizens and to deter criminals through deterrence and enforcement of the laws against counter-feiting. In many ways, Australia leads the way through the introduction of 12 security feature that make the future Euro fool-proof and ECB a respected and credible actor among friends and foes. Trust me, if you don't deliver security you will be knifed in Frankfurt's Bendergasse, Carmen.

Cultural and historical motifs drift across currency like rivers and birds, flowing through space and time, connecting nations, regions, landscapes, legends, philosophers, artists, and poets. They carry the past into the present, the local into the continental, and the imagined into the tangible, transforming the currency into a living archive of European plurality. Public participation, design competitions, and commemorative issues amplify this voice, allowing citizens to inscribe their own histories, memories, and identities into the medium itself. Architecture, nature, language, and folklore intertwine, forming a polyphonic chorus of identity in which difference is celebrated within unity, specificity within universality, and memory within aspiration.

Even beauty bears its cost: cotton fibers strain under repeated handling, metals glimmer yet guzzle energy, mining and production leave hidden footprints, and circulation spreads the environmental weight across borders and time. Yet recycling flows through banknotes and coins like a restorative river, polymer promises longevity, alloys are reborn in cycles of creation and recreation, and energy use can be offset by sustainable production. Through these choices, the euro becomes both a material and symbolic instrument, balancing durability and delicacy, tradition and innovation, utility and artistry. Every note and coin is ephemeral yet enduring, common yet extraordinary, ordinary yet resonant, carrying identity, security, culture, and environmental responsibility within its small but weighty frame.

The Euro, therefore, is not merely currency; it is a canvas of European identity, a guardian of trust, a carrier of memory, and a marker of responsibility, intertwining unity and diversity, security and fragility, culture and conservation, and history and futurity in a single, tangible, circulating artifact. It is the clink and the whisper, the shimmer and the shadow, the ephemeral and the eternal, embodying all that Europe is, all that it hopes to be, and all that it must preserve.

The proposed design elements for the future Euro banknotes have been selected to integrate the complementary dimensions of nature, culture, and historical-personal symbolism, thereby creating a narrative that reflects the European Union's shared heritage and identity. The **European bison** has been chosen as a representative motif of natural heritage and ecological resilience for the five Euro cent. Once nearing extinction, the species' successful revival across Europe exemplifies both environmental stewardship and transnational collaboration, symbolizing continuity and stability within the continent's ecological and cultural landscape.

The strategy would reposition European currency as a medium that tells a story—of nature, culture, and personality—while advancing practical goals of standardization, sustainability, and longevity. By combining these elements, the EU could pioneer a model of monetary design that is visionary, distinct, and uniquely European.

The narrative surrounding European euro banknotes and coinage can be framed as a deliberate articulation of **simultaneity between the deepening of financial union and the standardization of currency design**. From a policy and central banking perspective, the euro is not merely a medium of exchange; it is an instrument through which integration, trust, and cohesion within the European Union are materially manifested. The harmonization of banknote and coin design—through consistent visual motifs, standardized materials, and coordinated denominations—serves both functional and symbolic purposes. Functionally, standardized designs ensure interoperability across national borders, facilitate automated authentication in vending machines and ATMs, and reinforce durability and security through uniform technical specifications. Symbolically, the consistent imagery—fictional bridges, arches, and stars representing the EU—creates a visual narrative of shared heritage and collective identity, transcending individual national motifs while preserving the possibility for member states to express cultural uniqueness on coin obverses.

From a central banker's vantage point, this simultaneity ensures that the euro can operate seamlessly across diverse economies while maintaining high security standards and material sustainability. Standardized currency design allows for optimized production processes, predictable circulation patterns, and efficient lifecycle management of banknotes and coins, all of which support the broader objective of a stable, resilient financial union. For policymakers, the euro's visual and material coherence signals institutional credibility and governance capacity, reinforcing public confidence in the single currency. The deliberate alignment of aesthetic uniformity with economic integration exemplifies how technical, cultural, and strategic considerations intersect in the management of a supranational currency.

For citizens, the simultaneity between financial union and design standardization is experienced in everyday interactions with money. Recognizable and reliable banknotes and coins foster trust and familiarity, facilitating cross-border transactions and promoting a sense of shared European belonging. Standardized designs, coupled with tactile and visual accessibility features, also ensure inclusivity, allowing all members of society to engage confidently with the currency. In essence, the euro's design and circulation narrative embodies a **synergistic relationship between economic integration and cultural communication**, demonstrating that technical standardization in currency issuance is inseparable from the broader project of European unity and financial cohesion.

The complementarity of things between bills and coins can be adumbrated according to the following household rules and strategic practices around the world in terms of dos and donts:

The complementarity between banknotes and coins can be adumbrated through a set of widely shared household rules and strategic practices observed across monetary systems. In everyday use, coins are associated with durability, frequency, and tactility: they are meant for repeated handling, small-value exchanges, transport, vending, tipping, and informal payments. Their physical resilience justifies higher minting costs and longer circulation lives, and their sensory qualities—weight, sound, and relief—support quick recognition without close

visual inspection. Coins are therefore “spent forward”: they circulate rapidly, return easily into use, and are socially accepted as interchangeable units of minor value.

Banknotes, by contrast, are governed by practices of care, storage, and visual legibility. They are folded, sorted, and kept in wallets, envelopes, or drawers, used for planned purchases, wage payments, gifts, or savings. Because notes wear out more quickly, they are treated with greater delicacy and replaced more frequently, which in turn justifies lighter materials and more elaborate graphic design. Banknotes are “spent deliberately”: they mediate larger transactions, signal trust and value, and rely on visual complexity rather than physical mass for authentication.

A central do-not rule emerges from this division: coins should not aspire to the narrative or pictorial density of banknotes, and banknotes should not imitate the blunt materiality of coins. When coins become overly illustrative or commemorative, they lose instant recognisability and transactional efficiency. When banknotes become too austere or purely symbolic, they forfeit their role as carriers of shared cultural meaning and institutional authority.

Strategically, well-designed monetary systems respect this complementarity by assigning abstraction, architecture, bridges, or institutional motifs to notes—elements that reward prolonged viewing—while reserving nature, fauna, elemental symbols, or simple emblems for coins, which are grasped and exchanged rather than contemplated. The household logic is simple but robust: what is handled most must be felt and heard; what is stored and counted must be seen and read. Together, coins and banknotes form a single domestic ecology of money, in which material, design, and usage reinforce rather than compete with one another.

There are, however, many hybrids positioning themselves in-between. There are many countries combining personalities with animals on the flipside, whereas in strategic and symbolic terms—relevant to EU iconography, coins, or environmental narratives—the red fox, roe deer, wild boar, wolf, and brown bear are the strongest candidates for representing animals shared by the greatest number of European countries, combining ecological reach with cultural recognisability. Also this I take issue with so long as the European bison and Portuguese Whale is shut out as candidates for a European animal symbol. When it comes to a European national bird the common buzzard, sparrow and pigeon are the most prevalent in Europe, but how representative are they of wild and beautiful Europe ?

The historical record demonstrates that complementarity between coins and banknotes is not a fixed formula but a flexible design philosophy shaped by political structure, cultural identity, and material constraints. Multinational currencies—from the Austro-Hungarian krone to the East African shilling and the CFA franc—show that a shared monetary system can succeed only when its iconography distributes symbolic functions in a way that respects both unity and diversity. The euro, as the most ambitious monetary union of the modern era, inherits this challenge in an intensified form. Its first-generation designs established a workable equilibrium: banknotes articulated a pan-European narrative through abstract architectural allegory, while coins preserved national specificity within a common framework. Yet the limitations of abstraction and the evolving cultural expectations of European citizens now invite a reconsideration of how this complementarity might be renewed.

The options available to future euro designers fall along a spectrum defined by the degree of thematic integration and the balance between national and supranational identity. One path preserves the existing structural logic but enriches the symbolic vocabulary, allowing banknotes to adopt more explicit narratives of shared European achievements while coins continue to express national identity. Another path shifts the emphasis toward a more unified aesthetic language across both media, creating coherence through style rather than theme. A third, more ambitious option reimagines the distribution of symbolic content altogether, perhaps introducing pan-European motifs on coins while allowing banknotes to explore broader cultural or historical narratives.

What unites these possibilities is the recognition that complementarity is not merely an aesthetic concern but a political and cultural one. A currency must be legible, trustworthy, and resonant; it must speak simultaneously to the everyday user and to the collective imagination. The euro’s future design will succeed only if it continues to balance the symbolic weight of national identities with the aspirational narrative of a shared European project. The historical precedents suggest that this balance is achievable, but only through a careful and deliberate articulation of the roles each medium plays. Coins and banknotes must not duplicate one another,

nor should they drift into unrelated iconographic worlds. Their strength lies in their dialogue: the metal expressing continuity and rootedness, the paper expressing narrative and aspiration.

In this sense, the complementarity options available to the euro are not merely technical choices but opportunities to shape how Europe understands itself. Whether through renewed abstraction, enriched narrative, or deeper stylistic unity, the next generation of euro designs will inevitably become part of the continent's cultural memory. The task is to ensure that they do so in a way that honors both the diversity of its member states and the shared ideals that bind them.

There are, however, many hybrids positioning themselves in between, blurring the classical division of labour between coins and banknotes. These hybrids emerge where technological innovation, inflationary pressure, cultural signalling, or institutional experimentation disrupt established household rules. High-denomination coins, bi-metallic and tri-metallic issues, polymer notes with pronounced tactile features, and heavily commemorative circulating coins all occupy this intermediary space, combining durability with visual narration or weight with symbolic excess.

Such hybrids often arise from pragmatic considerations—cost efficiency, lifespan extension, anti-counterfeiting—or from political and cultural ambitions to embed identity more densely into everyday money. Yet their success depends on whether they respect functional thresholds. When coins begin to demand prolonged visual attention, they slow transactions and confuse denomination hierarchies. When banknotes acquire excessive thickness, stiffness, or relief, they resist folding, storage, and rapid counting, undermining domestic and commercial routines.

In strategic terms, hybrids are most effective when they act as transitional instruments rather than permanent standards: inflation-adjustment coins easing the withdrawal of small notes, polymer notes introducing tactile cues without abandoning visual clarity, or limited commemoratives that circulate without redefining the system. Poorly governed hybrids, by contrast, tend to accumulate at the margins—hoarded, avoided, or quickly withdrawn—revealing that complementarity is not merely aesthetic but behavioural.

The existence of hybrids therefore confirms rather than negates the underlying logic of monetary design. They test the elasticity of the system, but they also expose its boundaries: money functions best when its forms remain legible to the hand, the eye, and the habits of everyday life.

Essentially, what the ECB is then doing is a *pas-de-deux*: They elevate culture and personalities from the coins to the Bill, while keeping the national mint. This is problematic in isolation to sit between two chairs, and it is in any event an outline of intentions and of our political project.

The 20 cent coin emphasizes Europe's rebellious spirit and militant skepticism.. **Jeanne d'Arc:** Embodies courage, national heritage, and the enduring influence of individual historical figures in European identity, comparable to Europe's militant skepticism and spirit of independence.

The Salomonikas in the cathedral at Santiago de Compostela are a great motive alluding both at the heritage of Europe in LATAM , to demonstrate humility and forbearance with the underlings and to state that it is what is inside man that makes the whole difference. Nonetheless, my preference leans toward Gaudi's La Sagrada Família. Its intricate façades and soaring towers create a sense of awe unlike any other cathedral. I find its combination of light, color, and organic forms utterly captivating. It is a difficult call.

Brandenburg Gate (Germany): The Brandenburg Gate stands as one of Europe's most iconic architectural and historical landmarks. Beyond its aesthetic significance, it symbolizes European political and historical continuity, embodying the endurance of institutions and civic ideals across centuries. Its prominent role during periods of division and reunification—most notably as a symbol during the Cold War and following the fall of the Berlin Wall—renders it a powerful emblem of resilience, reconciliation, and the restoration of unity. In the context of Euro coinage, the Brandenburg Gate conveys the continent's capacity to overcome political fragmentation, embrace democratic values, and foster cohesion among diverse nations, reflecting both historical memory and contemporary European identity.

The depiction of Michelangelo's Vitruvan man *Uomo* on the €1 coin represents the pinnacle of Renaissance humanism, celebrating the European tradition of intellectual, artistic, and cultural achievement. As a visual

motif, *Uomo* embodies the harmonious balance between physical form and human intellect, reflecting the Renaissance ideal that human beings are the central measure of creativity, innovation, and moral reflection. Placing this figure on the €1 coin—widely circulated and highly visible—reinforces the notion that Europe’s cultural and intellectual heritage is not only historically significant but also foundational to contemporary European identity. Furthermore, it underscores the continent’s enduring influence on global art, philosophy, and scientific thought, linking everyday monetary exchange with an aspirational vision of human potential, creativity, and shared continental achievement.

Finally, **Europa**, the mythological figure from which the continent derives its name, serves as a symbolic articulation of pan-European identity. This is the Greek 2 Euros. Her narrative embodies themes of unity, shared origin, and cultural continuity that predate contemporary nation-states, providing a mythic framework that contextualizes the Union’s current integration within a long historical trajectory.

Collectively, these motifs operationalize a unitary design strategy that is both integrative and emblematic. By combining natural, cultural, and personal-historical elements, the proposed Euro banknotes would convey a multilayered narrative of European identity, emphasizing shared heritage, resilience, and creativity, while fostering symbolic cohesion across the Union.

I favor a bold approach although not fully harmonized as outlined above, but we all accept that status quo is not an option on both bill and coinage.

This would make for a convincing and more audacious approach to the Eurozone’s bill and coinage-series, if still not an entirely harmonized one.

So much more New Caledonia has now opted for reintegration a la Martinique into the EU pending the accommodation of the Kanakys objectives and interests.

Further Research

Avenues for further research encompass a broad range of dimensions relating to the evolution and adaptation of the euro. One important area is the impact of design changes on public perception. Investigating how alterations in banknote aesthetics influence trust, acceptance, and day-to-day use of the euro is particularly relevant in contexts of economic uncertainty or heightened sensitivity to price fluctuations. Closely related is the value of comparative analysis of currency redesigns, drawing on case studies from other countries that have recently undertaken similar projects. Such research can reveal best practices and cautionary lessons that may inform a strategic approach for the European Central Bank in planning and executing any euro banknote transitions.

Technological innovations also present promising avenues for inquiry. Emerging tools, including blockchain applications and digital currency frameworks, could enhance both the security and functionality of euro banknotes and coins. Equally, sustainability in currency production warrants closer examination, assessing the environmental impacts of current manufacturing methods and evaluating the potential of alternative materials or eco-friendly production processes to reduce carbon footprints and resource use.

Cultural symbolism represents another dimension of interest. Research into how narratives, motifs, and symbolic elements can be harmonized to reflect a shared European identity—while simultaneously acknowledging national diversity—may offer insights for more resonant and meaningful currency design. In parallel, the effectiveness of public communication strategies during currency transitions is a crucial area for study, particularly regarding how proactive engagement versus reactive messaging shapes public confidence and smooth adoption.

Economic considerations, such as the practical utility and cost-effectiveness of low-denomination coins, also deserve attention, as does the geopolitical dimension of currency design. The ways in which the visual and functional attributes of euro banknotes and coins influence the euro’s global standing and perception in non-euro regions can carry implications for international finance and diplomatic positioning. Accessibility and inclusivity are further critical aspects, with opportunities to improve tactile features, visual clarity, and overall usability for individuals with disabilities, ensuring that the currency serves all members of society.

Finally, the long-term integration of digital currencies alongside traditional cash systems invites research into consumer behavior, monetary policy implications, and the potential for hybrid financial ecosystems. Collectively, these research avenues offer the potential to generate nuanced insights into both the immediate and strategic challenges associated with euro banknote changeover and the broader evolution of currency within Europe.

Counter-arguments

One potential counterargument is that a broader, multi-faceted approach may dilute focus and slow implementation. By attempting to integrate design, technology, sustainability, inclusivity, and communication into a single coordinated strategy, decision-making can become more complex and bureaucratic, potentially delaying the actual issuance of new banknotes and coins. In contrast, a more narrowly targeted design competition allows for clear, fast outcomes, with tangible results that can be publicly showcased and tested without the overhead of multiple simultaneous initiatives.

A second concern relates to cost and resource allocation. Expanding the scope of the changeover to include research on digital integration, sustainability, and geopolitical considerations may require significant investment in studies, prototyping, and coordination across institutions and stakeholders. These costs could outweigh the immediate benefits of the changeover itself, particularly if the public perceives the effort primarily as an aesthetic update rather than as delivering measurable improvements in security, usability, or economic efficiency.

Another counterargument centers on public comprehension and engagement. A broader approach risks overwhelming citizens and businesses with too many simultaneous changes or messages. Whereas a focused design competition produces a clear narrative—such as “new banknotes, new faces, new bridges”—a combined strategy involving multiple complex initiatives could confuse the public, reduce trust, and hamper adoption. Clarity and simplicity are often critical in monetary transitions.

There is also the issue of governance and accountability. Coordinating multiple initiatives across design, technology, communications, sustainability, and policy could create ambiguities in responsibility. This can lead to coordination failures, conflicting priorities, and slower responses to emerging issues, undermining the efficiency and credibility of the changeover process. A streamlined, competition-driven approach allows for well-defined roles and clearer evaluation of success.

Finally, broader approaches may encounter resistance from stakeholders who prefer traditional processes. Financial institutions, retailers, and citizens are accustomed to predictable, incremental changes; introducing extensive technological, cultural, and sustainability dimensions simultaneously may generate skepticism or pushback, complicating implementation and reducing the likelihood of smooth adoption.

In short, while a combined, multi-dimensional approach offers long-term strategic benefits, these counterarguments suggest that a narrowly focused design competition or a well-defined incremental changeover process may provide clearer, faster, and more manageable outcomes, reducing risk, cost, and public confusion.

Scenarios

Several scenarios illustrate how current strategic practices in currency management can inadvertently create vulnerabilities, reduce public confidence, and increase costs. One scenario involves banknotes and coins produced with suboptimal security features. If anti-counterfeiting measures are outdated, inconsistently applied, or poorly integrated, they may allow sophisticated forgeries to enter circulation. The perception of weak security can erode trust in the currency, provoke increased demand for alternative payment methods, and impose higher costs on central banks and commercial institutions tasked with detecting and removing counterfeit notes.

A second scenario concerns the physical degradation of coins. In some minting practices, the selection of metal alloys or protective coatings is insufficient to prevent oxidation or corrosion. Coins exposed to environmental factors such as humidity, industrial pollutants, or contact with acidic substances can deteriorate unevenly, producing visual and tactile differences between coins of the same denomination. This not only reduces usability but also increases production costs, as coins may need to be withdrawn or replaced prematurely.

A third scenario involves inconsistent design and production practices across successive mint batches. Frequent or repeated redesigns, whether to refresh aesthetics or address minor security vulnerabilities, can create confusion among the public and commercial actors. Coins and notes from different series may differ subtly in color, size, weight, or texture, complicating automated cash handling systems, vending machines, and banking operations. This inconsistency can also be exploited by counterfeiters, who may focus on older or transitional designs that are less rigorously protected.

A fourth scenario highlights the risk of counterfeiters exploiting vague or insufficiently standardized minting practices. When minting processes, metal compositions, or embossing techniques vary across mints or production runs, these differences can be exploited to produce near-authentic counterfeits that pass casual inspection. In extreme cases, poorly documented or inconsistent minting methods may allow fraudulent actors to reproduce coins or notes using off-site facilities, further undermining public confidence.

Combined, these scenarios suggest that even minor lapses in strategic oversight—whether in security feature deployment, material science, or standardization across mints—can magnify operational risks, increase costs, and reduce public trust. They underscore the importance of a tightly coordinated, high-precision approach to currency design, production, and lifecycle management, integrating robust anti-counterfeiting technologies, corrosion-resistant materials, and harmonized minting standards.

In this overlap:

- Policy ensures credibility, anti-counterfeiting, and international trust.
- Operations guarantee durability, standardization, and lifecycle management.
- Organizational learning captures feedback, lessons, and continuous improvement.
- The intersection represents the ECB's strategic sweet spot, where these three mutually reinforce each other to maintain euro integrity and adaptability.



The vulnerabilities highlighted in current currency management practices—ranging from weak security and inconsistent minting to coin oxidation and repeated redesigns—carry substantial implications for the European Central Bank's policy posture, as well as for its organizational learning and internal governance. These challenges underscore the need for the ECB to adopt a proactive, anticipatory approach to currency oversight, integrating risk management, operational consistency, and continuous improvement into its institutional practices.

At a strategic level, weak security measures in banknotes and coins directly affect monetary credibility. The ECB's policy posture must therefore prioritize continuous innovation in anti-counterfeiting technologies, rigorous quality control, and standardized production across all mints. Beyond immediate operational concerns, this implies a learning imperative: the ECB must institutionalize mechanisms to systematically capture lessons from past security breaches, near-miss events, and international best practices. Such learning would enable faster adaptation to emerging threats and foster a culture of vigilance across organizational units.

Similarly, the degradation of coins through oxidation or corrosion highlights the importance of evidence-based lifecycle management. Organizationally, this requires closer integration between material science experts, minting authorities, and policy planners, ensuring that production choices are informed by long-term durability studies and environmental testing. The ECB must also embed iterative feedback loops to monitor the condition of coins in circulation, so that lessons from wear and tear are rapidly translated into design adjustments or replacement schedules. This promotes both operational resilience and a continuous learning ethos within the institution.

Repeated redesigns and non-uniform minting practices reveal risks associated with decentralized decision-making. From a policy perspective, the ECB needs a governance model that balances national autonomy with centralized oversight. Learning and organizational implications here include the establishment of standardized design review protocols, cross-mint coordination committees, and structured knowledge-sharing platforms, ensuring that insights from one mint or member state can inform broader strategic decisions. This would reduce inconsistencies, limit opportunities for counterfeiting, and improve efficiency in cash-handling systems across the eurozone.

Finally, these vulnerabilities intersect with broader strategic goals, including the euro's role as a stable international currency. Weak or inconsistent currency practices can undermine confidence abroad, affecting the ECB's ability to project monetary stability and influence. To address this, the ECB must cultivate organizational capabilities in strategic foresight, scenario planning, and cross-functional coordination. Embedding structured learning processes within the institution—such as after-action reviews, internal audits, and benchmarking against international best practices—would ensure that lessons are not only identified but actively incorporated into operational and strategic planning.

In conclusion, the scenarios of weak security, coin degradation, and inconsistent minting indicate that the ECB cannot treat currency production as purely operational or aesthetic. The policy posture must integrate technological innovation, material resilience, and governance rigor, while simultaneously fostering organizational learning and adaptive capacity. By doing so, the ECB can reinforce the euro's credibility, ensure operational efficiency, and maintain both domestic and international confidence in its currency over the long term.

Policy recommendations

The 2028 euro banknote changeover should be managed as a strategic operation of monetary security, not merely a design update. Governance must be structured around clear lines of responsibility, coordination, and accountability across all Eurosystem actors. A dedicated **Euro Monetary Security Steering Group** should be established, bringing together the ECB, national central banks, mints, the European Commission, and representation from the Council and Parliament, to oversee planning, rollout, and public communication. Policy frameworks should explicitly integrate both **technical durability and symbolic continuity**, recognising that banknotes and coins together form the tangible backbone of euro trust. Public communication campaigns must be anticipatory rather than reactive, explaining the continuity of value and payment functionality to prevent perception-driven inflation concerns. National central banks should be required to synchronise operational logistics, including distribution, withdrawal, and withdrawal of old banknotes, with a central monitoring mechanism at the ECB to track progress and flag divergences. Coins, due to their long life and symbolic stability, should remain largely unchanged, anchoring public trust and reinforcing continuity. Design governance should be formalised through a **Design & Trust Panel** combining security printing experts, historians, behavioural economists, and designers, to ensure that aesthetics, symbolism, and security features reinforce one another and enhance legitimacy. Integration with the emerging digital euro should be explicitly framed as complementary, emphasising a dual-system model in which cash continues to provide resilience and inclusion. External communication with trading partners should be coordinated to maintain international confidence in the euro,

highlighting the changeover as a demonstration of continuity and institutional competence. Regular post-implementation audits and public reporting should be mandated, evaluating both technical performance and perception metrics, so lessons can be applied to future currency updates. Contingency protocols should be prepared for operational, technological, or geopolitical disruptions, ensuring rapid coordination across national and EU-level actors. Legal and procedural frameworks should be clarified to prevent ambiguity regarding responsibilities, particularly for enforcement of security standards and crisis response. Training and simulation exercises for operational staff at central banks and mints should be institutionalised to anticipate logistical or technical challenges. Finally, the ECB and Eurosystem should adopt a **proactive, cross-actor governance doctrine** in which banknote redesigns are treated as systemic security operations, thereby embedding trust, durability, and legitimacy at the centre of euro monetary policy.

Perspective

The transition toward a comprehensive redesign of euro banknotes and the standardisation of euro coinage constitutes not merely a technical exercise but a significant institutional undertaking. Its success will depend on a clearly articulated sense of purpose capable of aligning the diverse mandates of the European Central Bank, national central banks, mints, and political institutions. It will also require a form of institutional empathy that recognises the symbolic, cultural, and affective attachments citizens hold toward existing monetary iconography, as well as the differentiated historical narratives embedded across member states. Finally, the process demands adaptive governance, able to navigate evolving security requirements, technological innovations in currency production, and the broader communicative role of money within a pluralistic European polity. Taken together, these capacities form the precondition for a monetary redesign that is operationally coherent, socially legitimate, and symbolically resonant.

From a broader perspective, euro coinage illustrates the intersection of functional currency design and cultural expression across the eurozone. The system comprises eight standard coin denominations: 1 cent, 2 cents, 5 cents, 10 cents, 20 cents, 50 cents, €1, and €2. With 21 member states issuing distinct national designs on the reverse of each coin, approximately 168 unique coin types exist in regular circulation. Beyond these standard coins, commemorative €2 issues—produced to mark national anniversaries, European milestones, or other significant events—have introduced more than 200 additional designs since the euro's inception. Collectively, this results in over 370 distinct euro coin designs, highlighting both the operational complexity of the currency system and the euro's role as a medium for expressing national identity within a shared European framework.

This diversity underscores several important considerations for currency management and central bank policy. First, it emphasizes the need for consistent security standards across multiple production sites and designs to mitigate counterfeiting risks. Second, it reflects the potential for currency to function as a cultural and political tool, shaping perceptions of legitimacy, trust, and European cohesion. Finally, the coexistence of standard circulation coins with an expanding array of commemoratives presents ongoing challenges for lifecycle management, public communication, and the harmonization of monetary operations across diverse national contexts.

The current eurocoinage framework, in which 21 eurozone countries issue national designs across eight denominations, presents a series of operational, security, and strategic vulnerabilities. Each country's production processes differ in quality control, materials, and anti-counterfeiting technologies, creating opportunities for degradation, counterfeit circulation, and inefficiencies in cross-border cash handling. Commemorative €2 coins, while culturally significant, further increase design heterogeneity, complicating validation and circulation monitoring. Collectively, these factors impose systemic risks on the currency's trust, durability, and legitimacy, undermining the euro's function as both a domestic medium of exchange and an international store of value.

A rational policy response requires addressing these structural risks at their root. Moving to a **unitary eurocoinage system**—in which all denominations are produced according to a single standardized design, quality specification, and security protocol—offers clear advantages. First, it maximizes **monetary security** by enabling uniform anti-counterfeiting measures across all coins, eliminating variations that criminal networks exploit. Second, it improves **operational efficiency**, simplifying minting logistics, reducing cross-border handling errors, and lowering long-term production costs through economies of scale. Third, it reinforces **trust and legitimacy** by presenting the euro as a coherent, consistent currency to both citizens and international partners, strengthening its symbolic and functional credibility.

From a governance perspective, a unitary system also enables the European Central Bank to institutionalize **systematic learning and adaptive management**. By consolidating production under a single framework, the ECB can monitor wear, circulation patterns, and public acceptance in a more controlled environment, rapidly integrating lessons into design updates or policy adjustments. Moreover, it mitigates the reputational and operational fragmentation associated with national designs, reducing the risk that inconsistencies are perceived as institutional weakness or vulnerability.

Culturally and politically, a unitary eurocoinage does not preclude national expression. Design motifs can still reflect shared European values while incorporating subtle references to member states, but within a standardized structure that ensures security, durability, and circulation efficiency. This compromise balances symbolic diversity with operational rationality, making it the only viable solution in a currency system that is simultaneously multi-national, high-volume, and globally recognized.

In conclusion, the current heterogeneous eurocoinage model produces avoidable inefficiencies, security gaps, and operational complexities. Only a transition to a **unitary eurocoinage system** can rationally address these challenges, providing a framework in which monetary integrity, institutional credibility, and European cohesion are mutually reinforced. Any alternative—maintaining the status quo or incrementally harmonizing designs—fails to resolve the fundamental vulnerabilities exposed by decades of circulation experience and counterfeiting risk.

Follow me. I am a leader.

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