

Pedagogical dossier of economic personification

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Chapter 1. Purpose, method and identity verification of the experts

This dossier is a working and discussion tool, compiled by artificial intelligence under the direction of Francois Dorleans, who is responsible for its orientation and final editorial decisions. It follows on from his personal research undertaken since obtaining the LSE MBA Essentials certificate in 2023, and addresses local complementary currencies (LCC), a subject considered relatively little debated. This document does not replace any standard, professional norm, or the opinion of a qualified expert: it is a reflection aid intended to explore a subject and to better understand the thinking of several real economists by testing it against a theme they did not necessarily address publicly during their lifetime. The scenario of a French national cashflow difficulty in 2026, used throughout the dossier as an illustrative framework, is a teaching case; it does not reflect an official study or a policy actually pursued by the French state. Particular attention is given to the demurrage mechanism often compared to that of air miles, to the accounting and financial benefits these schemes could provide to companies in this teaching case, to the real scale of the economic lever they would represent, to their legal framework and historical precedent, and to a particularly constrained case study, that of Hungary.

The positions presented are not real quotations. They are a reasoned reconstruction based on each author's published theories and documented positions, transposed to a case none of them addressed during their lifetime or in their public work. No sentence in quotation marks is attributed to these individuals in chapters 3 to 7 and 12; only their general, known and published theses are linked to them. A methodological note: four of the five personified experts, Friedman, Buchanan, Graham and Galbraith, are deceased; their positions are therefore necessarily extrapolations. Olivier Blanchard is the only one of the five still living; this is why this dossier notes, in Chapter 12, that a direct outreach to him is in preparation, an undertaking distinct in nature from the personification exercise applied to the other four.

Prior identity verification, to remove any ambiguity about the individuals referred to: these are exclusively economists and financial analysts, not homonyms from other fields.

Milton Friedman (1912-2006): American economist, leading figure of the Chicago School, Nobel Memorial Prize in Economic Sciences 1976, theorist of monetarism.

James M. Buchanan (1919-2013): American economist, founder of public choice theory and of the Virginia School, Nobel Memorial Prize in Economic Sciences 1986.

Benjamin Graham (1894-1976): American-British financial analyst, founder of fundamental security analysis (value investing), professor at Columbia Business School, mentor to Warren Buffett. He is not a

macroeconomist or a monetary theorist; his expected contribution in this dossier concerns the method of evaluating a financial instrument, not monetary policy.

Olivier Blanchard (born 1948): French macroeconomist, professor emeritus at the Massachusetts Institute of Technology, former Chief Economist of the International Monetary Fund from 2008 to 2015, currently senior fellow at the Peterson Institute for International Economics.

John Kenneth Galbraith (1908-2006): Canadian-American economist, leading figure of Keynesian institutionalism, professor at Harvard University, adviser to several Democratic administrations in the United States, author notably of *The Affluent Society* (1958) and *The New Industrial State* (1967).

The repeated mention of Milton Friedman in the original instruction is treated as a single individual; no duplicate position is introduced in this dossier.

1.0 Summary of the reference article by Christian Gelleri

Gelleri, Christian. *Reshaping the Future of Europe with Complementary Currencies*. *European Papers*, vol. 6, 2021, No 2, pp. 1015-1025. The article argues that local complementary currencies should be more fully integrated into the European Union's legal framework rather than treated as a blind spot of the law. It recalls the examples of the Chiemgauer, Sardex and Eusko, situates the monetary pluralism already tolerated under European law, notably regarding the status of Sweden and Denmark outside the euro, and details the legal status of local currencies in Germany, tolerated by case law as long as the scheme remains limited in time and geographic extent. It then develops the idea of a collective, democratic design of money, contrasts oligarchical and democratic ways of creating money through a critique of Facebook's Libra project, and concludes by advocating partnerships between central banks and complementary currencies to address growing economic inequality in Europe.

1.a The individuals cited by Gelleri

This section presents, in chronological order of birth, all the individuals drawn on in Gelleri's article, whether or not they directly supported a complementary currency.

Hartwig, Archbishop of Salzburg (born c. 955, died 5 December 1023): archbishop from 991 until his death, in 996 he obtained from Emperor Otto III the right to mint coins and hold markets for the Chiemgau, a right that remained in force until secularisation in 1803. Gelleri cites him as the earliest known precedent of a regional currency tied to the geographic area of the modern Chiemgauer.

Otto III, Holy Roman Emperor (born 980, died 1002): emperor from 996, he granted Hartwig the rights that enabled the issuance of the Chiemgau coinage, cited by Gelleri in the same historical context.

Robert Owen (born 14 May 1771, died 17 November 1858): Welsh social reformer, pioneer of the cooperative movement, founder of the New Lanark industrial community. In 1832 he devised the National Equitable Labour Exchange in London, a labour-note system valuing exchanges in hours rather than metallic currency. Gelleri cites him as a direct antecedent of time-based currencies and as an inspiration for the cooperative movement that influenced later complementary currencies.

John Dewey (born 20 October 1859, died 1 June 1952): American philosopher, a leading figure of pragmatism, author of *The Public and Its Problems* (1927). Gelleri draws on his concepts of the Great Society and the Great Community to describe the communal dimension of so-called associative currencies.

Karl Polanyi (born 25 October 1886, died 23 April 1964): Austro-Hungarian economist and historian, author of *The Great Transformation* (1944). Gelleri draws on his work to situate the historical and cultural embeddedness of money in society, prior to its transformation into an abstract commodity.

Friedrich Hayek (born 8 May 1899, died 23 March 1992): Austrian-British economist, Nobel Memorial Prize in Economic Sciences 1974, author of *Denationalisation of Money* (1976). Gelleri cites him regarding the idea of competition among private currencies, to which he links Facebook's Libra project.

Bernard Lietaer (born 20 March 1942, died 4 February 2019): Belgian economist, co-architect of the European Currency Unit (ECU) at the National Bank of Belgium in the 1970s-1980s, a technical forerunner of the euro. He later became one of the most prolific researchers on complementary currencies, advising numerous local initiatives, including the Chiemgauer. Gelleri cites him as the central reference for defining a complementary currency.

David Graeber (born 12 February 1961, died 2 September 2020): American anthropologist, professor at the London School of Economics, author of *Debt: The First 5,000 Years* (2011). Gelleri cites him for his thesis on the military origin of minted money, linked to the payment of soldiers.

Peter Bofinger (born 1954, exact date not confirmed by a single source; documented publications since the mid-1980s): German economist, former member of the German Council of Economic Experts. Gelleri cites him for his criticism of the Libra project, which he described as an enrichment programme benefiting only the shareholders of the Libra Association.

Paul Tucker (born 1958, exact date not confirmed by a single source; documented publications from the 1980s through *Unelected Power*, 2018): former Deputy Governor of the Bank of England, now a researcher at Harvard. Gelleri draws on his work to discuss the democratic legitimacy of official monetary institutions.

Annelise Riles (birth date not published; documented publications from the late 1990s through *Financial Citizenship*, 2018): legal anthropologist, professor notably at Northwestern University. Gelleri cites her on the construction of a legitimacy narrative for a currency, whether official or complementary.

Christine Desan (birth date not published; documented publications from the 2000s through *Making Money*, 2014): professor at Harvard Law School, historian of monetary law. Gelleri draws on her work to show that the design of money results from a contested political process rather than a neutral discovery.

Jerome Blanc (birth date not published; documented publications from the late 1990s to the present): French economist, professor at Sciences Po Lyon, specialist in the plurality of monetary forms. Gelleri draws on his typology distinguishing public money, business money and associative money, the category to which he assigns the Chiemgauer.

Christian Gelleri (birth date not published; documented publications from 2009 to the 2021 article examined in this dossier, with research activity ongoing at the University of Würzburg): author of the reference article, a trained economics teacher, founder in 2003 of the Chiemgauer with six pupils at a Waldorf school in Bavaria, now managing director of the Regios eG cooperative. More than twenty years after its creation, the Chiemgauer remains Germany's most widely used regional currency.

1.b Seven practical questions clarified

Is it an exclusively digital currency in some countries? Yes. The Swiss WIR and the Italian Sardex both operate on a purely electronic basis, with no paper notes issued at all, whereas the Chiemgauer and the Eusko combine paper notes with electronic payment.

Is it possible to pay part of a salary in LCC? As a rule, no, not as a component of wages proper: labour law requires wages to be paid in legal-tender currency. What does exist in practice, in several networks including the Eusko, is the voluntary payment of a supplement or bonus in local currency, on top of wages paid in full in euros.

Is it possible to save in LCC? This remains technically possible, but the demurrage mechanism deliberately discourages this practice by reducing the value of unspent units. An LCC is therefore not a savings instrument comparable to a guaranteed bank deposit.

Is it possible to buy housing in LCC? No, for legal reasons: a real-estate transaction requires a notarised deed, land-registry publicity and payment traceable in legal-tender currency, which structurally excludes LCCs in both France and Spain.

But is it possible to pay rent in LCC? The answer is nuanced: possible in principle if the landlord is itself a recognised acceptor within the network, as is the case for certain social and solidarity economy structures such as housing cooperatives; marginal for an ordinary tenancy between private individuals outside the acceptor network.

Is it possible to buy vegetables, a loaf of bread? Yes, without reservation: this is precisely the core use for which LCCs were designed, as shown by the networks of accepting food shops in existing French and German schemes.

Seventh question: do the benefits drawn from the deposit capital belong to the association that created the currency, once bank fees have been settled? As a rule, yes. The reserve account, although legally ring-fenced to guarantee full backing of the units in circulation, remains the property of the issuing entity, whether a French loi 1901 association or a structure such as a Nonprofit Kft. in Hungary, as described in Chapter 6. Any yield on this deposit, net of bank fees, therefore accrues to that entity rather than to individual holders of the local currency, which remains responsible for allocating it in line with the governance and transparency rules already set out in Chapter 8, generally for the benefit of local sustainability projects rather than direct redistribution.

1.c Conclusion: probable benefits and the distribution of cost in France

The probable benefits of a local complementary currency in France, as they emerge from this dossier as a whole, are not distributed evenly. Small local businesses integrated into the network draw the most direct benefit, in the form of captured local demand and cash-flow resilience, as detailed in Chapter 14. Associations and social and solidarity economy structures benefit from the redirection of a share of conversion fees, on the model observed for the Chiemgauer. Citizens and territories involved draw a less measurable but real benefit of strengthened community bonds and local trust, a dimension highlighted by Galbraith in Chapter 7. The French state, by contrast, draws only a marginal and indirect benefit: Chapter 9 showed that this lever remains below two percent of the annual public deficit, which rules out any substitution effect for national fiscal correction.

The question of cost calls for an equally differentiated answer. The holder of a local-currency unit in fact bears the cost of demurrage: as Graham noted in Chapter 5, a unit that expires mechanically transfers value from the holder to the issuer. Accepting businesses bear the cost of reconversion, generally not less than five percent, as well as an opportunity cost when they hold unremunerated units. Issuing structures bear the management cost and, above all, the cost of tying up capital arising from the obligation to hold full backing in euros, a reserve that cannot be invested elsewhere. Finally, as Buchanan warned in Chapter 4, the most significant risk for public finances is not a direct budgetary cost, since the 2014 SSE law excludes any automatic public guarantee, but a risk of fiscal illusion: were the scheme used to give the appearance of

public action without bearing its real budgetary cost, the burden would then fall on citizens and businesses in the network rather than on the state budget, without this transfer always being visible to taxpayers as a whole.

Chapter 2. Context 2026: difficulty of French national cashflow

The hypothetical scenario retained by the author rests on the following macroeconomic context: euro-area public deficit estimated between 3.3 and 3.5 percent of GDP, an increase in European Central Bank key rates in the face of inflation of 3.0 to 3.4 percent, and high financing needs for defence, the energy transition and fifth-generation heating and cooling networks (5GDHC). Within this illustrative framework, France is assumed to be exploring financing instruments complementary to the national budget, including local currencies and geo-bonds indexed to territorial thermal production, presented in tranche 3 of a hybrid financing structure.

The question put to the five contributors is the following: can local complementary currencies ease the French national cashflow constraint in 2026 without degrading fiscal sustainability or monetary clarity in the country, what concrete benefits can companies draw from them in their accounts, what is the real scale of this lever at the national macroeconomic level, and, beyond France, can these schemes become levers of economic, technical and emotional synergy in each of the European countries they cross, including in the most constrained regulatory configurations.

Chapter 3. Hypothetical position of Milton Friedman

True to his quantity theory of money and his preference for a stable, predictable rule for money-supply growth, Milton Friedman would greet local complementary currencies with marked caution. His reading would distinguish two cases. If the local currency arises from a private, voluntary initiative, without public guarantee or legal tender status, it falls within the currency competition he considered theoretically legitimate, in line with the debate opened by Friedrich Hayek on the denationalisation of money. If, however, it is backed by a state or local-authority guarantee, or if its issuance funds spending outside the voted budget, Friedman would see in it a new form of discretionary money creation, liable to blur the price signal and feed an illusion of free resources. On the demurrage mechanism, he would see a technically neutral device in itself, comparable to a contractual expiry date, but would stress that the demurrage rate is in fact a negative interest rate imposed de facto, whose effect on local saving and spending decisions should be measured with the same rigour as any monetary-policy instrument. On the French 2026 case, he would warn against using geo-bonds as a disguised substitute for conventional public borrowing, and would demand that any local currency remain strictly convertible, capped in volume, and without any spillover effect on the already elevated underlying inflation in the euro area.

Chapter 4. Hypothetical position of James Buchanan

James Buchanan would approach the question through the lens of public choice, that is, the real incentives of the political and administrative actors who issue or support a local currency. His analytical framework, developed with Gordon Tullock in *The Calculus of Consent*, would lead him to question the risk of fiscal illusion: a citizen or a local official may underestimate the true cost of a scheme that does not appear as debt in official public accounts. Buchanan would see in geo-bonds fertile ground for local rent-seeking, where interest groups capture the scheme for their own benefit without the cost being visible to taxpayers as a whole. He would also observe that the demurrage mechanism, by accelerating the local velocity of money, alters economic agents' incentives in a way that deserves to be governed by a stable rule rather than left to

the discretion of local issuers. His typical recommendation would remain constitutional rather than discretionary: enshrine in a stable, enforceable rule an issuance cap, a limited duration, and an obligation to publish consolidated accounts of liabilities linked to local currencies, so as to prevent them from becoming an escape valve from national fiscal discipline. He would nonetheless acknowledge a positive value in the contractual and voluntary dimension of these currencies, which connects with his interest in decentralised institutions founded on mutual consent rather than coercion.

Chapter 5. Hypothetical position of Benjamin Graham

Benjamin Graham is not a monetary theorist; his expected contribution concerns the method for valuing a financial instrument, applied here to geo-bonds and local currencies presented as crowdfunding securities. True to the principles set out in *Security Analysis* and *The Intelligent Investor*, Graham would apply to geo-bonds the same protocol as to any security: identification of the intrinsic value of the collateral, here the geothermal thermal production guaranteeing repayment, assessment of the margin of safety between the issue price and that intrinsic value, and examination of the actual liquidity and redemption conditions. On the demurrage mechanism, comparable to that of time-limited air miles, he would point out that a unit of value that expires is not neutral for either the holder or the issuer: it mechanically transfers value from the holder to the issuer, and must therefore be analysed as an implicit cost for the former and a potential gain for the latter, exactly as in the accounting treatment of unused airline miles. He would warn against market enthusiasm, which he personified as Mr. Market, and would advise the citizen-investor not to subscribe to a geo-bond out of mere territorial attachment without first verifying the soundness of the underlying asset, the announced eight-to-fifteen-year payback period, and the sensitivity of that period to a reduction in public subsidies.

Chapter 6. Hypothetical position of Olivier Blanchard

Olivier Blanchard, whose recent work addresses the sustainability of public debt in light of the differential between the real interest rate and the growth rate, would place his analysis of local complementary currencies within the broader framework of financing productive public investment. His position would consist of accepting local currencies as a useful but marginal building block, capable of mobilising otherwise idle citizen savings for the benefit of infrastructure projects with strong positive externalities, such as 5GDHC networks. He would make this favourable reception conditional on two precise requirements: that geo-bond issuance not increase consolidated public debt without a corresponding productive asset, and that the return on the financed project remain above the cost of sovereign capital, a positive net-present-value condition. Blanchard would further note that the demurrage mechanism, by stimulating the local velocity of money, produces a measurable local Keynesian multiplier effect, which can support the activity of small territorial businesses without weighing on the national budget, provided this circulation gain is not double-counted in the macroeconomic evaluation of the scheme.

Chapter 7. Hypothetical position of John Kenneth Galbraith

John Kenneth Galbraith would approach the question of local complementary currencies through the Keynesian institutionalist lens he developed in *The Affluent Society* and *The New Industrial State*. A critic of the self-regulating market and of the technostructure of large corporations that, in his view, escape classical competitive discipline, Galbraith would see in LCCs a potential instrument of countervailing power, allowing citizens, small businesses and local authorities to rebuild a capacity for economic action against the

concentration of private power and against the rigour of orthodox monetary policy defended by Friedman and by the European Central Bank. On this point he would be markedly more favourable than Friedman toward an active role for public authorities in steering and supporting these schemes, joining Blanchard in the conviction that the state must invest massively in public goods and correct imbalances that the market does not spontaneously correct.

Galbraith would, however, introduce a reservation specific to his thinking: the risk that the local-currency scheme be captured by a form of local technostructure, that is, by large companies, better-resourced local authorities or insider networks already possessing superior means of influence, reproducing at territorial scale the power biases he denounced at national and international scale. He would therefore insist on the need for democratic, inclusive and transparent governance of local currencies, explicitly involving small businesses, associations and lower-income citizens, so as to prevent the tool from becoming a mere image-polishing or cash-management instrument for already dominant actors. On the French 2026 case, Galbraith would support the integration of geo-bonds and local currencies into a deliberate public policy of territorial rebalancing, never losing sight of the fact that their usefulness depends less on financial return alone, a central criterion for Graham and Blanchard, than on their capacity to effectively redistribute economic power for the benefit of the many.

Chapter 8. Confrontation and synthesis of the five positions

The central disagreement pits Friedman, for whom any parallel currency backed by a public guarantee constitutes a risk of monetary dilution and an illusion of free resources, against Galbraith and Blanchard, for whom the instrument can be judged on its net contribution to productive investment and to economic rebalancing, provided governance and return conditions are met. Buchanan and Graham occupy an intermediate but convergent position on one point: both demand prior transparency, one on the consolidated accounting commitments of issuing local authorities, the other on the intrinsic value of the collateral offered to the subscriber and on the accounting treatment of demurrage. Galbraith, finally, shifts the debate toward the question of power: where Friedman worries about the money supply and Buchanan about fiscal incentives, Galbraith worries about the capture of the scheme by already dominant actors, whether public or private. None of the five recommends unregulated adoption of local currencies as a solution to French national cashflow; the divergence concerns the nature of the required framework, monetary for Friedman, constitutional and fiscal for Buchanan, contractual and informational for Graham, macroeconomic and fiscal for Blanchard, and democratic and distributive for Galbraith.

The operational synthesis that emerges from this confrontation retains five cumulative conditions for a local complementary currency to usefully contribute, in France, to relieving national cashflow difficulty in 2026: an issuance cap and guaranteed convertibility avoiding any local inflationary drift, Friedman's condition; an enforceable fiscal rule prohibiting use of the scheme as an escape route from the national constraint, Buchanan's condition; regular, verifiable disclosure of the value of the collateral, of the redemption terms and of the accounting treatment of demurrage, Graham's condition; exclusive targeting of projects whose return exceeds the cost of sovereign capital, Blanchard's condition; and democratic, inclusive governance preventing capture of the scheme by a local technostructure, Galbraith's condition.

Chapter 9. Evaluation of the French economic lever

Beyond the theoretical debate among the five experts, an order-of-magnitude evaluation is needed to situate the real weight of local complementary currencies in resolving French national cashflow difficulty in 2026.

This evaluation remains indicative, built solely from simple orders of magnitude; it does not constitute an official forecast and should be treated as a pedagogical calibration exercise, in keeping with the spirit of module 7 on rapid financial diagnosis through ratios.

The French public deficit, within the euro-area range of 3.3 to 3.5 percent of GDP retained for 2026, represents, for an economy whose gross domestic product stands at an order of magnitude of 2,900 to 3,000 billion euros, an annual financing need of roughly 95 to 105 billion euros. The European programme for deploying 5GDHC networks is, in turn, estimated at between 200 and 300 billion euros over the 2027-2035 period, financed to the extent of 10 to 20 percent by the citizen and local tranche including geo-bonds and complementary currencies.

Taking an indicative French share of around 15 to 20 percent of this European programme, given the national geothermal potential already noted, the total French envelope would stand between 30 and 60 billion euros over roughly eight years, or 4 to 8 billion euros per year. The citizen and local tranche, at 10-20 percent of that amount, would then represent on the order of 0.4 to 1.6 billion euros per year of financing actually carried by local currencies and geo-bonds. Set against the state's annual financing need evaluated above, this contribution represents, in order of magnitude, less than two percent of the annual French public deficit.

This evaluation leads to a conclusion consistent with the synthesis in Chapter 8: the national economic lever of local complementary currencies, applied to the 5GDHC component alone, remains marginal at the macroeconomic scale of the country and cannot under any circumstances substitute for a national fiscal correction of several tens of billions of euros. The effect becomes significant, by contrast, at a finer scale, that of a territory, a sector, or a company strongly integrated into the local circuit, as detailed in Chapter 14 on benefits recorded on companies' balance sheets, where the circulation-velocity multiplier effect highlighted by Blanchard and Galbraith can represent a substantial share of local economic activity without weighing measurably on national aggregates.

Chapter 10. Legal framework and historical precedent: real-estate purchase and rationing coupons

This question deserves to be settled on legal grounds: in both France and Spain, the purchase of a real-estate asset cannot be carried out in local complementary currency. In France, Law No. 2014-856 of 31 July 2014 on the social and solidarity economy introduced local complementary currency instruments into the monetary and financial code, as an exception to the banking monopoly set out in Article L.521-2, but this exception is strictly circumscribed: LCCs may only be used to settle goods and services produced within the social and solidarity economy, within a limited network of member businesses, and must be fully backed by an equivalent amount in euros held in a reserve account controlled by the *Autorité de contrôle prudentiel et de résolution*. A real-estate transaction requires a notarised deed, land-registry publicity and payment traceable in legal-tender currency; it therefore falls structurally outside the scope defined by the 2014 law, independently of any explicit prohibition naming real estate specifically.

In Spain, the situation is even more restrictive, for want of a nationally recognised equivalent to the 2014 French law: Spanish local social currencies, such as the Puma in Seville or the Turuta in Vilanova i la Geltrú, operate under associative status or as local exchange trading systems, without a dedicated legal basis in the Spanish civil code or mortgage law. The real-estate sale deed, the *escritura pública*, must be denominated and settled in legal-tender currency and registered at the *Registro de la Propiedad* under notarial control, which excludes any direct use of a social currency for this type of transaction.

This contemporary legal finding is nonetheless not without historical precedent. The rationing-coupon system, maintained in France until 1949 for certain foodstuffs after the Second World War, constituted, like LCCs, a set of restricted-use value units, non-convertible into legal-tender currency, limited to a precise category of goods, bread, sugar, textiles or petrol, and to a set period. The hypothesis that this segmentation by micro-categories of goods may have played a stabilising role during the reconstruction period, by guaranteeing minimal access to essential goods independently of pressures on the national currency, remains debated among economic historians and is not a matter of consensus regarding its real weight compared with other recovery factors, such as external aid from the Marshall Plan, price-control policy or demographic recovery. It nonetheless offers a direct conceptual antecedent to today's sector-restricted currency schemes, whose closest contemporary heirs in France are the luncheon voucher, created in 1967, and the energy voucher, created in 2018, both restricted-use payment instruments, non-convertible into cash, and accepted within a defined network of suppliers.

Chapter 11. Case study: Hungary and the economic, technical and emotional synergies of LCCs

Hungary constitutes a relevant case study for assessing the capacity of local complementary currencies to become levers of synergy under a particularly constrained regulatory framework. In 1945 and 1946 the country experienced the most severe hyperinflation episode ever recorded in modern monetary history: the pengő suffered such extreme depreciation that the forint, introduced on 1 August 1946, replaced it at an exchange rate expressed in considerable powers of ten. This founding episode largely explains the cautious stance of the Magyar Nemzeti Bank, Hungary's central bank, whose primary mandate remains price stability. Hungary, a European Union member since 2004, has moreover not adopted the euro and retains the forint as its sole legal tender, which reinforces the country's institutional attachment to exclusive control of its monetary policy and correspondingly limits its tolerance for parallel payment schemes, whether domestic or foreign.

In this context, Hungarian local-currency initiatives, such as the Kekfrank, used in certain localities notably at the initiative of anti-poverty organisations, operate under a considerably more constrained regime than their French counterparts, without legal recognition comparable to that offered by the 2014 French social and solidarity economy law. This degree of regulatory severity makes it, among the countries crossed by a European economic stress scenario in 2026, the most restrictive example retained in this dossier, and the most demanding ground on which to test the hypothesis of an economic, technical and emotional synergy.

Economically, a Kekfrank-type scheme, confined to a very local network and lacking protective legal status, can only claim a restricted circulation effect, not comparable in scale to the role played by post-war rationing coupons at national level. Technically, the Hungarian regulatory constraint imposes a particularly rigorous design for the scheme, non-convertible, fully backed and confined to basic necessities, which, paradoxically, brings it closer to the historical model of rationing coupons than the more flexible French LCCs. Emotionally, it is precisely in a context of institutional distrust inherited from hyperinflation that the dimension of local trust and territorial belonging, highlighted by Galbraith in Chapter 7, takes on its fullest meaning: where trust in the national currency has been historically shattered, rebuilding a bond of trust at the scale of a small community can represent a real added value, even though it is not measurable through the usual macroeconomic aggregates.

Chapter 12. Extrapolating the thinking and the voice of the living

This chapter directly answers the question of what the five experts would say if their thinking were extrapolated to the Hungarian case and to the hypothesis of an economic, technical and emotional synergy of LCCs in 2026. Four of the five experts personified in this dossier are deceased; their position can therefore only be a reasoned extrapolation, already flagged as such in Chapter 1. The fifth, Olivier Blanchard, is living, which changes the nature of the exercise: his position can, in principle, be verified directly rather than merely reconstructed.

Extrapolation for Milton Friedman: even in the most constrained Hungarian case, Friedman would remain sceptical of a corrective role for the state, but might concede that, in a framework with as vivid a hyperinflationary memory as Hungary's, a strictly backed, non-convertible parallel currency confined to precise categories of goods, in the image of rationing coupons, is precisely the type of scheme compatible with his preference for automatic rather than discretionary rules. He would, however, grant no analytical value to the emotional dimension, which he would consider foreign to the field of rigorous monetary analysis.

Extrapolation for James Buchanan: the Hungarian case would illustrate his original warning in reinforced form. The stricter the national rule and the more vivid the institutional memory of inflation, the more sensitive the risk of local circumvention becomes if the legal framework does not anticipate controlled safety valves. Buchanan would recommend, precisely where institutional distrust is strongest, an even more formal constitutional framework than that outlined for France in Chapter 8.

Extrapolation for Benjamin Graham: whatever the severity of the national framework, the method for analysing collateral and margin of safety would remain identical. The Hungarian case, by tightening the regulatory constraint, mechanically reduces the liquidity of any local instrument and therefore increases, all else equal, the risk for the subscriber, which would justify greater caution than in the French case.

Extrapolation for John Kenneth Galbraith: the Hungarian case would confirm his thesis of countervailing power. The more the central state shows distrust and locks down the local monetary space, the more precious the dimension of community resilience and trust becomes, as a form of social capital that the usual macroeconomic aggregates do not measure. It is in this reading that the emotional dimension raised in the original question finds its theoretical anchor closest to Galbraith's thinking.

The voice of the living: unlike the four preceding analyses, necessarily hypothetical, Olivier Blanchard's position on this precise subject can, in 2026, be directly sought. This is the purpose of an outreach effort in preparation, intended to put to him the question of the role that local complementary currencies, including in configurations as constrained as the Hungarian case, could play in giving French, and by extension European, cashflow some room to breathe in the stress context of summer 2026. Until a direct answer is obtained, this dossier can only offer a cautious extrapolation, consistent with his published work already cited in Chapter 6: Blanchard would likely agree to examine the scheme provided the test that returns exceed the cost of sovereign capital is met, and would probably remain circumspect about any non-quantifiable emotional dimension, while acknowledging, as an economist who has theorised the effects of confidence on debt sustainability, that citizens' trust in a local scheme can carry indirect economic value, through the stability of local demand and the reduction in social risk it provides.

Chapter 13. LCCs compared to air miles: the demurrage mechanism

The comparison between local complementary currencies and airline mileage programmes rests on a genuine structural kinship. In both cases, a unit of value is issued in exchange for a purchase or a use, circulates within a closed network of accepting partners, and loses its value if not used before a set deadline. This mechanism, called demurrage or negative-interest currency when applied to money, has its theoretical

origin in Silvio Gesell's work on decaying or 'shrinking' money, taken up by certain French local currencies to discourage hoarding and to accelerate the local velocity of money.

Several French local currencies do incorporate demurrage, generally at a rate of around two percent every six months, applied by requiring a stamp to be affixed to notes to extend their validity, whereas other schemes, such as the Swiss WIR franc, operate without demurrage. This mechanism should therefore not be generalised to all local complementary currencies, but treated as a design choice, adopted or not depending on the objectives pursued by each territory.

From an accounting standpoint, the kinship with air miles is direct. International Financial Reporting Standards, in particular IFRS 15 on revenue from contracts with customers, require issuers of loyalty programmes to recognise issued units as a deferred liability until they are used or expire. When rights expire unexercised, a situation the accounting profession calls breakage, the issuer recognises revenue corresponding to the release of that liability. The same reasoning applies by analogy to local-currency units not spent before their demurrage deadline, which opens up, for accepting or issuing companies, a range of financial effects running from minor to major, detailed in the following chapter.

Chapter 14. Benefits for companies on the balance sheet: from minor to major effect

Companies that accept, issue or hold local complementary currencies can draw financial benefits of widely varying nature and scale. The following list ranks them by increasing impact on the financial statements, from the most marginal to the most structural.

Minor effects

- Lower transaction fees: local-currency payment circuits often avoid bank charges or international card-network commissions, which slightly reduces operating expenses without changing the structure of the balance sheet.
- Brand and social-responsibility value: accepting a local currency strengthens a company's image of local proximity and territorial anchoring, an intangible benefit not recognised on the balance sheet but liable to support future revenue, comparable to the loyalty effect sought by airline mileage programmes.
- Local commercial differentiation: a qualitative competitive advantage, difficult to quantify in isolation, closer to the marketing benefit of a loyalty programme than to a direct financial gain.

Intermediate effects

- Cash-flow advantage through advance funding: when the local currency is prepaid by customers before consumption, the company benefits from a cash float comparable to that provided by gift cards or prepaid miles, temporarily improving its working capital.
- Breakage revenue linked to demurrage: local-currency units received in payment but not reconverted or reused before their demurrage deadline may, depending on the scheme's contractual regime, generate accounting revenue for the holding company, through a mechanism analogous to the breakage of unused airline miles, recognised as exceptional income or operating income depending on the applicable accounting standard.
- Easier access to a network of local partners: participation in a local currency often opens privileged access to local public procurement, purchasing groups or territorial financing, which can reduce the cost of acquiring new customers or suppliers.

- Tax advantages or specific regulatory status: certain organisations running local currencies in France fall under the social and solidarity economy regime, giving member companies access to support schemes or partial exemptions, within the limits set by applicable regulation.

Major effects

- Access to crowdfunded financing complementary to bank credit: subscription of local geo-bonds by companies or citizens allows productive investments, such as 5GDHC heat networks, to be financed without relying entirely on conventional bank credit, which can improve the leverage and gearing ratios of the company carrying the project.
- Capture of local demand and defence of market share: in a context of commercial leakage toward online retail, a well-diffused local currency can durably redirect a significant share of consumer demand toward the local business fabric, with a direct and cumulative effect on the revenue of accepting companies, an effect substantially larger in scale than transaction-fee savings.
- Local multiplier effect on activity: the increased velocity of circulation induced by demurrage, as described in Chapters 6 and 7 in the readings attributed to Olivier Blanchard and John Kenneth Galbraith, can translate into a measurable rise in the business volume of companies located downstream in the local value chain, a macroeconomic effect that extends beyond the individual company but of which it is the direct beneficiary.
- Improved cash-flow resilience during national stress: in the French national cashflow difficulty scenario of 2026, a company strongly integrated into a robust local-currency circuit has a payment and financing channel partly disconnected from national banking liquidity strain, which constitutes potentially the most significant financial effect, subject to the five cumulative conditions set out in Chapter 8.

This gradation illustrates why the comparison with air miles is useful but incomplete: the demurrage mechanism plays an analogous accounting role, but the overall effect on a company's balance sheet and income statement depends above all on its degree of integration into the local circuit, well beyond the mere breakage revenue generated by expired units.

Chapter 15. Concrete application to the French 2026 case

Applied to a hybrid financing structure for 5GDHC networks, with a citizen and local tranche of ten to twenty percent of capital, this five-condition framework translates operationally as follows. Local geo-bonds, indexed to territorial thermal production, would be capped in volume per project and published in a consolidated register accessible to state services, meeting Buchanan's requirement. Their redemption would remain strictly convertible into euros or energy at a transparent rate, without discretionary money creation, meeting Friedman's requirement. Each issuance would be accompanied by an information notice detailing the value of the geothermal collateral, the margin of safety offered to the subscriber and the accounting treatment of any demurrage clause, meeting Graham's requirement. Only projects whose expected return on investment remains within the subsidy period and whose yield exceeds the cost of sovereign capital would be eligible for this crowdfunding-based financing, meeting Blanchard's requirement. Finally, the governance of each local scheme would compulsorily involve representatives of small businesses, associations and lower-income households of the territory, meeting Galbraith's requirement.

Under these conditions, the five experts, despite their substantive disagreements, would converge on a shared conclusion: local complementary currencies can only constitute, as shown in Chapter 9, a marginal and tightly regulated complement to the repair of French national cashflow at macroeconomic scale, never a substitute for national fiscal correction itself nor an instrument for purchasing real estate, but can, as illustrated by the Hungarian case in Chapter 11, constitute a genuine lever of economic, technical and

emotional synergy at the scale of the most constrained territories, provided there is rigorous governance and a technical design as strict as that inherited from post-war rationing coupons.

Chapter 16. Examples of local complementary currencies in Europe and beyond

Before turning to practical use cases, it is useful to place the French project within an already rich landscape of real-world experience. The summary below draws in particular on the work of Christian Gelleri, a researcher at the University of Würzburg and the designer of the Chiemgauer, published in the journal *European Papers*.

- Chiemgauer (Germany and Austria, the region between Munich and Salzburg): launched in the early 2000s, it circulates both as paper notes and through an electronic payment system; a share of the exchange fees is passed on to local non-profit organisations active in education, environmental protection and culture.
- Sardex (Italy, Sardinia): a mutual-credit currency between businesses, bringing together more than four thousand companies in a network, interest-free and exclusively electronic, with no notes issued; each member business records, on average, additional turnover of around ten thousand euros through the scheme.
- Eusko (France, the Basque Country, Bayonne): supported by local authorities, it brings together more than nine hundred accepting businesses and operates both through paper notes and electronic payment.
- WIR (Switzerland): an inter-business clearing currency created in 1934, entirely electronic for many years now, managed by WIR Bank, with no notes issued.
- Torekes (Belgium, Ghent): a complementary currency with an ecological and social aim, mentioned by Gelleri among initiatives that address local environmental problems.
- Bocskai Korona and Balatoni Korona (Hungary): Hungarian precedents that inspired the design of the Dunai Korona project, examined in the dossier devoted to the 2026 Danube crisis.
- BerkShares (United States, Massachusetts) and Palmas (Brazil): examples outside the euro area illustrating the diversity of models, from a dollar-backed paper note to a community-bank social currency.

This diversity confirms a central finding of Gelleri's article: there is no single model of local complementary currency, but a plurality of schemes suited to different objectives, ranging from reviving local economic circulation to building community trust.

Chapter 17. Hypothetical benefit curve and specifications for a management application

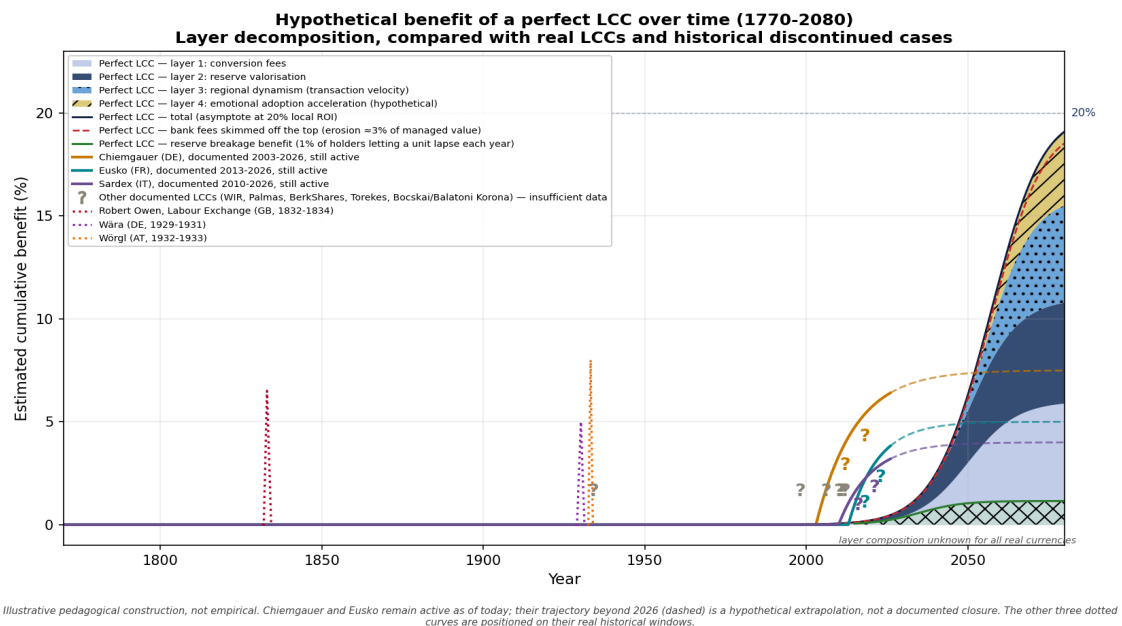
This chapter presents an illustrative, non-empirical pedagogical construction intended to visualise over time the cumulative benefit that a local complementary currency scheme could theoretically produce, and then describes the functional specifications of an application for the practical management of such a hypothetical currency, referred to here as X.

17.1 Benefit curve of a perfect LCC, 1770-2080

The chart below takes 1770 as its starting point in order to include the period of activity of Robert Owen, whose 1832 National Equitable Labour Exchange is one of the antecedents cited in Chapter 1.a, and extends to 2080 to represent the asymptotic behaviour of a theoretical success case. The central curve represents a perfect LCC, that is, a hypothetical construction rather than a real observed currency, whose cumulative

benefit is decomposed into four stacked layers, whose sum asymptotically reaches one hundred percent of a theoretical potential set at twenty percent local return, this figure itself being a working hypothesis rather than an observed datum.

The first two layers are mechanical, present from the scheme's outset, and keep a fixed proportion relative to each other and to the total at every point in time, with no inversion or curvature change between them: layer 1 corresponds to the conversion fees collected by the issuing entity on reconversion transactions, as described in Chapter 6, and layer 2 corresponds to the valorisation of the equivalent amount held in euros in the reserve account, taken here as a hypothetical reference. The following two layers keep the same target share of the total, but their build-up is delayed in time by construction, only reaching their full weight after an adoption maturation period; they are shown with a hatched texture to signal their more speculative nature compared with the first two. Layer 3 represents the dynamism of the regional business fabric, understood as the acceleration in the velocity of currency X transactions as the acceptor network grows denser, on the model of the local multiplier effect already described by Blanchard in Chapter 6 and by Galbraith in Chapter 7. Layer 4, the most uncertain, represents a quasi-emotional and unpredictable acceleration in adoption, which may occur once a critical mass of community trust is reached, without it being possible to guarantee either its scale or its timing; it is deliberately positioned last in the stack and shown with the most pronounced texture to signal that, of the four, it rests least on an identifiable accounting mechanism.



A red dashed line marks, at the top of the stack, the erosion represented by bank fees skimmed off the managed value, in line with the distinction drawn in Chapter 17.2 between the bank portion and the net associative portion. This erosion is shown as proportional to the total value under management at each point in time, on the order of three percent, rather than as a fixed amount, since the volume of transactions processed by the bank grows with the scheme as a whole. It therefore slightly trims, without visually erasing, the top of the perfect LCC's total curve.

The question marks placed beneath the Chiemgauer and Eusko curves are a reminder that the layer decomposition proposed for the perfect LCC is an analytical construction with no documented equivalent for these two real currencies: the public data available, already drawn on in Chapter 16, allow their overall apparent benefit trajectory to be established, but do not allow the portion attributable to conversion fees, reserve valorisation, regional dynamism, or any community-driven acceleration to be distinguished within it.

It is worth stressing that all four layers share the same twenty-percent ceiling: the appearance of layers 3 and 4 does not add to the total potential of the perfect LCC, but redistributes its composition as the scheme matures, with the share of the two initial mechanical layers shrinking proportionally as regional-dynamism and community-adoption effects take over. Every curve tied to this hypothetical construction is now explicitly prefixed with the label Perfect LCC, so as to distinguish it unambiguously from the curves of real currencies also shown.

The green curve, also tied to the perfect LCC, deserves a precise definition: it represents the reserve breakage benefit on the assumption that one percent of holders, each year, would let at least one unit lapse without reconverting it before the parameter B deadline described in Chapter 17.2. Its surface is deliberately textured with a crosshatch pattern, unlike the solid fill used for the perfect LCC's other curves, to visually signal that it is a flow distinct from the four stacked layers rather than an additional component of their sum. It is therefore a recurring annual flow, not a stock accumulated once and for all: as the total number of units in circulation grows with the maturation of the scheme, the absolute amount of this breakage benefit also grows, while remaining, under this assumption, a minor share of the perfect LCC's overall benefit, well below the four stacked layers.

The perfect LCC further illustrates the situation of a community whose local monetary circulation progressively reaches its maximum potential: businesses in the network then benefit from a cumulative effect of local consumption value creation, through the retention within the territory of incoming investment and the reduction of spending leaking outside the community, which improves their sales market beyond their costs of participating in the scheme, over a horizon deliberately extended to 2080 to represent long-run behaviour close to the asymptote.

Three real currencies have been added for comparison: the Chiemgauer (DE), documented from its 2003 launch to 2026, the Eusko (FR), documented from its 2013 launch to 2026, and Sardex (IT), documented from its 2010 launch to 2026. Contrary to an initial hypothesis considered for this chart, none of the three has been closed: all three schemes remain active as of the drafting of this dossier, having brought locally documented positive value, notably in terms of circulation velocity, the number of accepting businesses, or additional turnover for Sardex, as detailed in Chapter 16. Their trajectory up to 2026 is therefore shown as a solid line, based on the available evidence; their continuation beyond 2026, shown dashed, is only a hypothetical extrapolation intended for visual comparison with the perfect LCC, and should not be read as a forecast.

The other local currencies catalogued in Chapter 16, namely the Swiss WIR, the Brazilian Palmas, the American BerkShares, the Belgian Torekes, and the Hungarian precedents of the Bocskai Korona and the Balatoni Korona, are not given an individual curve on this chart. They are grouped as a cluster of question marks positioned at their approximate year of creation, with a single legend entry indicating insufficient data: unlike the Chiemgauer, the Eusko and Sardex, these schemes are not, to the author's knowledge, covered by public data detailed and consistent enough over time to plot a comparable benefit trajectory, which justifies their treatment as a cluster rather than as individual curves.

The three remaining dotted curves situate, within their real historical windows, known complementary currencies that declined or were stopped owing to their time-limited contractual framework or to prohibition by monetary authorities: Robert Owen's Labour Exchange (GB, 1832-1834), the Wära currency in Germany (DE, 1929-1931), banned by the Reichsbank, and the Wörgl currency in Austria (AT, 1932-1933), halted by injunction of the Austrian central bank despite locally documented positive results. The legend gives, in parentheses, the two-letter code of each currency's country of origin. The vertical amplitude of these three

curves remains indicative and does not claim to be measured on the same basis as the perfect LCC or the two currencies still active today.

17.2 Functional specifications for a management application for the hypothetical currency X

This section describes, as a working hypothesis, the features an application could offer for the operational management of a hypothetical local complementary currency referred to as X, consistent with the mechanisms already set out in Chapters 6 and 13.

Fee parameters. Two distinct rates govern conversion: the purchase rate, or RP¹ for rate to purchase, applied when converting euros into currency X, and the sale rate, or CPS² for cost percentage to sell, applied when reconverting currency X back into euros. Both parameters are configurable by the issuing entity within the general business conditions, on the model already described for the Dunai Korona in Chapter 6.

Distinguishing bank fees from associative value. The application should systematically distinguish, within the RP and CPS fees collected, the portion passed on to the bank holding the reserve account and processing transactions from the net portion retained by the issuing entity. This distinction matters: the bank's portion, even where the institution concerned has a local branch physically present in the community, is value that leaves the associative circuit, in the sense that it remunerates a third-party commercial actor rather than funding the local sustainability projects targeted in Chapter 6. Only the net portion, after deduction of bank fees, should therefore feed layer 1 of the chart in Chapter 17.1 and the governance dashboard described later in this chapter.

Depreciation parameters. The life cycle of each unit of currency X is governed by two time parameters. Parameter A defines a six-month grace period from the acquisition date, during which the unit retains one hundred percent of its face value. Parameter B defines a second six-month period, starting when parameter A expires, during which the unit's value progressively declines to zero by the end of the twelfth month following acquisition. Both parameters, expressed in months, remain configurable by the issuing entity within the rates suggested in Chapter 6.

Time-stamped batch consumption logic. Each receipt of currency X, whether resulting from a purchase from the issuer or a payment received from a third party, opens a new batch individually time-stamped at its arrival date, independently of the user's overall balance. The application applies, by default, a first-in-first-out consumption logic, on the model of buying fruit: just as a household consumes the oldest fruit before buying more, so as to avoid waste, the application proposes, at each payment, to spend first the batches closest to the expiry of their parameter A, then those that have entered the parameter B depreciation phase, before the most recent batches. This logic is intended to encourage the effective circulation of the currency rather than its hoarding, in keeping with the intent set out in Chapter 13.

Interface features. The user's wallet would display each batch with a freshness colour code inspired by the same fruit analogy: green for batches under six months at full value, yellow for batches that have entered the parameter B depreciation window, red for batches close to full expiry, and grey for expired batches at zero value. Notifications would prompt the user to spend batches close to expiry first. A dashboard for the issuing entity would allow real-time tracking of the euro reserve coverage ratio, the gross volume of RP and CPS fees collected broken down between the bank portion and the net associative portion, and the cumulative amount resulting from the expiry of unused units, this last figure feeding the green curve of the chart in Chapter 17.1.

¹ RP - acronym created in the case of this hypothetical application "Rate to Purchase », Purchase cost as a percentage of X

² CPS - acronym created in the case of this hypothetical application "Cost Percentage to Sell", cost of sale as a percentage of X

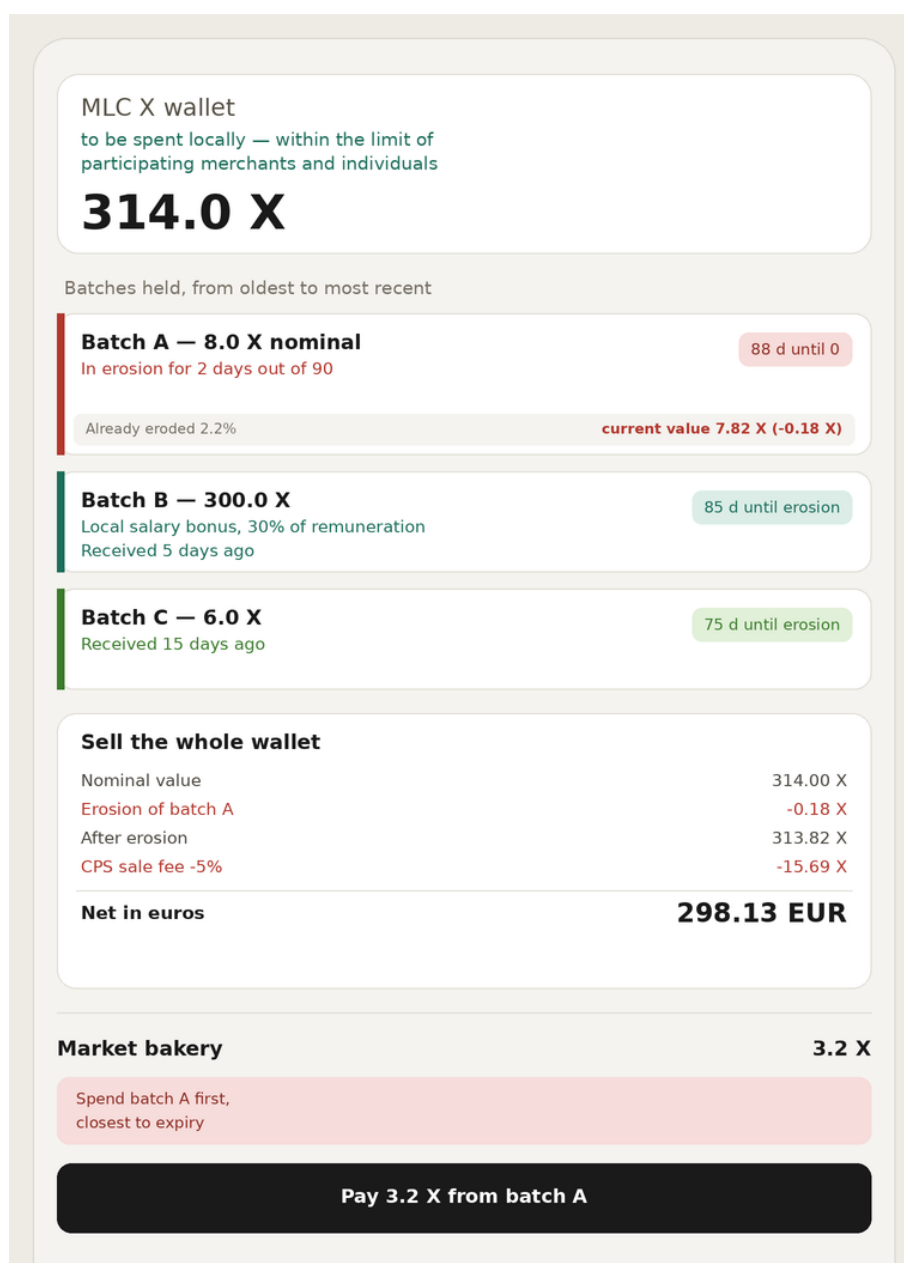
Accounting for breakage benefit. In line with the answer given to the seventh question in Chapter 1.b, the amount corresponding to expired units would accrue to the issuing entity, through a mechanism analogous to the accounting treatment of breakage already detailed in Chapter 13, and should be recorded separately in the governance dashboard, in keeping with the transparency requirement set out by Buchanan in Chapter 4 and by Galbraith in Chapter 7.

17.3 Screen simulation: an individual's wallet

The two screen mock-ups that follow remain working illustrations, intended to make the mechanics described in this chapter concrete; they are neither screenshots of an existing product nor tax or accounting advice. The individual wallet screen displays, beneath the heading Wallet MLC X, the note to be spent locally, within the limit of participating merchants and individuals, a constant reminder of the acceptance scope defined in Chapter 6.

The simulated wallet holds three batches for a total nominal value of 314 X. Batch A, eight X, entered erosion two days ago out of the ninety days of parameter B used for this example; the screen explicitly shows the percentage already eroded, 2.2 percent, and the batch's current value after this erosion, 7.82 X, a loss of 0.18 X. Batch B, three hundred X, is presented as a local salary bonus representing thirty percent of the holder's total remuneration, in line with the answer given to the second question in Chapter 1.b on the voluntary payment of a supplement in local currency; consistent with the same display format as the other batches, the screen shows it as received five days ago, with eighty-five days remaining before its erosion begins. Batch C, six X, remains within its grace period.

A sell-the-whole-wallet function simulates converting all batches into euros at the CPS rate of minus five percent defined in Chapter 17.2. The calculation explicitly separates the two mechanisms of value loss for the holder: erosion, which benefits the issuing entity's reserve, removes 0.18 X; the CPS sale fee, which benefits the banking institution, removes a further 15.69 X from the balance after erosion. The resulting net amount, 298.13 euros, therefore represents a cumulative loss of 5.1 percent of the nominal value, split between associative benefit and bank leakage along the distinction already drawn in Chapter 17.2. Finally, the checkout screen at an accepting merchant applies the first-in-first-out logic described in Chapter 17.2, explicitly suggesting that batch A, closest to expiry, be spent first.



17.4 Screen simulation: an employer's payroll dashboard

The second mock-up simulates the dashboard of a thirteen-employee company that has chosen to integrate a currency X bonus into its staff remuneration. Each employee receives a base of seven hundred euros, seventy percent of total remuneration, topped up by a bonus of three hundred X, the remaining thirty percent, on the model already illustrated in Chapter 17.3.

An important funding point: rather than buying the three thousand nine hundred X required from the bank issuing currency X, which would have exposed the company to the five percent RP rate defined in Chapter 17.2, the company deducts this amount directly from its own revenue already received in euros and X from its local customers. This choice saves it one hundred and ninety-five euros in purchase fees it would otherwise have had to pay the bank.

The dashboard then presents, on a purely hypothetical basis and without any tax-advice value, a fuller profit and loss statement allowing the real weight of this bonus's funding and of conversion fees to be situated at company scale. Total revenue stands at two hundred thousand, of which one hundred and fifty thousand euros from sales outside the network and fifty thousand X from local sales accepted in the complementary

currency. Purchases and charges from outside the region, which must be settled in euros with suppliers located outside the territory, amount to sixty thousand euros; part of this amount is funded by reconvertng twenty thousand X of local revenue, which incurs a CPS conversion fee of minus five percent, that is a further one thousand euros in bank fees. The payroll of thirteen thousand, base and X bonus combined for the thirteen employees, is added to this, along with fifteen thousand of other operating charges. The resulting profit before tax stands at one hundred and eleven thousand, expressed in euros and X at parity.

It is on this total profit, not on the payroll line alone, that the hypothetical twenty percent tax applies, amounting to twenty-two thousand two hundred, in keeping with the principle that corporate tax bears on the overall result in euros and X rather than on a single isolated expense line. Payroll taxes, whose hypothetical standard rate is set at forty-two percent, separately benefit from a one-percentage-point rebate on account of the company's participation in the local currency X programme, bringing the effective rate applied to the payroll alone down to forty-one percent, that is five thousand three hundred and thirty rather than five thousand four hundred and sixty. Net income thus stands at eighty-three thousand four hundred and seventy. Set against profit before tax, the bonus funding, thirteen thousand, and the fees for converting funds to pay outside suppliers, one thousand, together represent only 12.6 percent of that profit, which puts their weight into perspective at company scale.

Below a separate dashed line, the report presents two hypothetical effects observed since the company joined the X programme, with no direct link to the costed profit and loss statement above and to be treated with the same methodological caution as the rest of this chapter: a fourteen percent increase in local revenue, and a forty-seven percent reduction in staff turnover. Were they to hold, these two effects would respectively join layer 3, regional dynamism, and layer 4, emotional adoption acceleration, of the chart in Chapter 17.1: the first reflects a measurable economic circulation effect, the second a retention gain that is harder to isolate from other human-resources factors, which justifies presenting them separately from the profit and loss statement proper. The cumulative saving directly linked to the X programme, the payroll-tax rebate plus the RP fees avoided through internally funding the bonus, further amounts to three hundred and twenty-five.

This second screen is presented as an A4 report sheet, tilted slightly in perspective as though placed on a table and viewed from a distance of around thirty centimetres, so as to visually distinguish this internal management document from the mobile wallet screen in Chapter 17.3.

ILLUSTRATIVE FINANCIAL REPORT

Profit and loss statement — 13 employees

hypothetical financial year, euros and X at parity

Total revenue	200 000
EUR 150,000 outside network, X 50,000 local sales	
Purchases and charges outside the region	-60 000
of which CPS conversion fee -5% on 20,000 X	
CPS conversion fee	-1 000
Payroll, base + X bonus	-13 000
Other operating charges	-15 000
Profit before tax	111 000
Hypothetical tax 20%, on EUR+X profit	-22 200
Payroll taxes, 41% after -1 pt rebate	-5 330
Net income	83 470

EFFECTS OBSERVED SINCE JOINING THE X PROGRAMME	
Local revenue	+14% (hypothetical)
Staff turnover	-47% (hypothetical)

17.5 Legal compliance of the assumptions and expert views on this simulation

This final section brings together the assumptions used in the two screen simulations, RP and CPS rates, the ninety-day demurrage cycle, a salary bonus representing thirty percent of total remuneration, a tax base on total profit in euros and X, a one-point rebate on payroll taxes, in order to assess their compatibility with the law of several European countries already cited in this dossier, Ukraine included, and then to set out the position that the five personified experts would probably take on this simulation.

In France, the 2014 SSE law framework recalled in Chapter 10 authorises LCCs only for settling goods and services within a limited network, and labour law requires wages to be paid in legal-tender currency. Staging a bonus representing thirty percent of total remuneration therefore remains legally acceptable only if it stays a voluntary supplement paid on top of the legal salary settled in full in euros, as already clarified in the second question of Chapter 1.b, rather than a structural share of remuneration itself. In Germany, the case-law tolerance described in Chapter 16 presupposes a scheme limited in time and geographic extent; the statutory minimum wage must be paid in full in euros, which confines the X bonus to a supplement above that floor. In Hungary, the *forgatható utalvány* regime detailed in Chapter 6 is explicitly defined as lacking legal-tender status and subject to prior notification to the Magyar Nemzeti Bank, without carrying any exception to Hungarian labour law on wage payment. In all three cases, the application described in Chapter 17.2 should also be examined against the limited-network exemption under European electronic-money law, since an application simultaneously covering food shops, salary use, and a large-scale wallet-selling function risks exceeding the narrow scope of that exemption and requiring authorisation as an electronic money institution.

The case of Ukraine, already flagged as the most restrictive in this dossier given the wartime context, deserves particular attention: the National Bank of Ukraine maintains, under martial law, strict controls on foreign exchange and cross-border payments. A scheme pegged to the euro and involving a guaranteed bank reserve would likely face greater regulatory obstacles than in Hungary, which makes Ukraine, among all the countries covered by this dossier, the context least immediately compatible with the simulation presented here. None of the legal frameworks examined therefore allow, as things stand, a direct implementation of the simulation as presented, particularly regarding the thirty-percent salary bonus and the multi-merchant scale of the application; qualified legal counsel would remain indispensable before any real implementation, in keeping with the warning already set out in Chapter 6.

Among the individuals cited in Chapter 1.a regarding Gelleri's article, most would probably have no objection in principle to an application such as the one described in Chapter 17.2, provided it remains deployed within the European Union and within the legal limits just recalled. Christian Gelleri himself, founder of the Chiemgauer, would likely see it as a logical and welcome extension of the demurrage and circulation logic he has himself implemented since 2003. Bernard Lietaer, whose entire body of work argued for monetary plurality, would welcome the principle of a programmable associative currency. Jerome Blanc would recognise in it a further textbook case within his category of associative money. Christine Desan and Annelise Riles, whose work addresses the political and narrative construction of monetary legitimacy, would find in the transparent governance described in Chapter 6 a relevant example rather than a ground for opposition. Peter Bofinger, whose criticism specifically targeted the oligarchic character of Facebook's Libra project, would by contrast see in a locally governed, fully backed associative currency the exact opposite of the model he denounced, and would therefore find no matter for objection in principle. Paul Tucker, finally, would focus his attention on the democratic legitimacy of the governance arrangement rather than on the very principle of its existence, which the governance dashboard in Chapter 17.2 is precisely designed to satisfy.

The case of Ukraine deserves to be nuanced beyond the sole finding of immediate regulatory incompatibility established above. Once the strictest exchange controls become conceivably liftable, within the framework of a possible post-war reconstruction, a scheme of this kind could potentially become a relevant tool for valuing an economic recovery conducted region by region, on the model of the German or Basque regional networks already studied in Chapter 16, rather than through a strictly centralised reconstruction plan. This prospect nonetheless remains hypothetical and conditional on a change in the Ukrainian regulatory framework that is not current as of the drafting of this dossier.

Extrapolation for Milton Friedman: he would remain sceptical of the fourteen and forty-seven percent figures put forward in the employer report, which he would consider empirically unverified and therefore unfit for any rigorous management decision, and would see in the one-point payroll-tax rebate a new form of discretionary distortion rather than a stable rule.

Extrapolation for James Buchanan: he would identify in this tax rebate a textbook case of rent-seeking should the criteria for participation in the X programme not be defined rigorously and transparently, directly extending the warning on fiscal illusion he sets out in Chapter 4.

Extrapolation for Benjamin Graham: he would apply to the fourteen and forty-seven percent figures the same rigour as to any unaudited data, treating them as unproven claims rather than reliable data, and would recommend independent verification before any integration into a real financial plan.

Extrapolation for Olivier Blanchard: he would look more favourably on the principle of basing tax on total profit in euros and X rather than on the payroll line alone, judging this architecture consistent with sound public-finance practice, and would see in the regional-dynamism effect a concrete illustration of the local multiplier already set out in Chapter 6.

Extrapolation for John Kenneth Galbraith: he would see in the reduced turnover an encouraging sign of loyalty and community trust, extending his reading in Chapter 7, while reiterating his reservation that a company deploying such a programme at scale could itself become a form of local technostructure, which in his view would justify democratic oversight of the scheme, including on the employer side.

It remains to ask whether the auditable character of the scheme, asserted throughout Chapter 17.2 by the governance dashboard, changes the nature of these objections. For Buchanan and for Graham, the answer is largely positive: their respective reservations concerned the absence of verification, fiscal illusion for the former, unproven data for the latter, and genuinely independent auditability would neutralise the bulk of their criticism, which is therefore not an objection in principle to the instrument itself but to its potential opacity. For Friedman, the answer would be more guarded: his objection bears less on the verifiability of the data than on the discretionary nature of the mechanism itself, a demurrage rate set by a governing board, a tax rebate granted by political decision, which no audit, however rigorous, turns into an automatic rule. He would therefore maintain, on this specific point, an objection in principle distinct from a mere demand for transparency.

17.6 Matter for debate: distributed-ledger security and comparison with bitcoin

This section brings together two open questions, deliberately presented as matter for debate rather than as settled conclusions, extending the reservations expressed in Chapter 17.5.

The first question concerns the technology used to secure the time-stamped batch register described in Chapter 17.2. A distributed ledger, of the blockchain type, would provide a technical guarantee that the history of issuance, transfers and expiries cannot be altered, which would mechanically strengthen the auditability already identified in Chapter 17.5 as a factor liable to satisfy the reservations of Buchanan and

Graham. This option is not, however, without trade-offs: a fully public, open blockchain would be difficult to reconcile with the know-your-customer and anti-money-laundering obligations that would apply to the issuing entity under the European electronic-money law already discussed in Chapter 17.5, which points instead toward a permissioned distributed ledger, restricted to the issuing entity, its supervisory authority and, in read-only form for transparency purposes, to acceptors and holders.

The second question concerns the comparison with bitcoin, to which currency X can be likened only on a limited number of points. The two schemes share the idea of programmable digital units circulating within a network and, were a distributed ledger to be adopted for currency X, a comparable underlying technical architecture. The differences, however, far outweigh the similarities. Bitcoin is designed as a scarce store of value, with a capped and diminishing issuance and no demurrage mechanism whatsoever, which structurally encourages hoarding rather than circulation; currency X, by contrast, rests on a parameterised demurrage whose sole purpose is to discourage hoarding, as noted in Chapter 13. Bitcoin has no central issuer and no guarantee of value, its price resulting solely from supply and demand on markets, whereas currency X remains fully backed by a euro reserve and pegged to a fixed exchange rate defined in Chapter 6, which excludes by design the speculative volatility characteristic of bitcoin. Bitcoin has no governance authority and no transparency dashboard comparable to that of Chapter 17.2. Currency X thus resembles, in its overall economics, the mutual-credit or associative-money schemes already catalogued in Chapter 16 far more closely than a store-of-value cryptocurrency, with distributed-ledger technology remaining, where adopted, a technical implementation choice independent of this fundamental difference in economic nature.

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Chapter 19. Definition of acronyms

5GDHC : fifth-generation district heating and cooling network

ECB : European Central Bank

COP : coefficient of performance of a heat pump

GDP : gross domestic product

HUF : Hungarian forint, ISO 4217 code of Hungary's legal-tender currency

IFRS : International Financial Reporting Standards

LCC : local complementary currency

LSE : London School of Economics and Political Science

MBA : Master of Business Administration

MNB : Magyar Nemzeti Bank, the central bank of Hungary

RRF : Recovery and Resilience Facility, European Union recovery mechanism

SSE : social and solidarity economy

LETS : local exchange trading system

Chapter 20. Real biographies and verifiable facts

Milton Friedman

Born in 1912 in Brooklyn and died in 2006 in San Francisco, Milton Friedman taught at the University of Chicago from 1946 to 1977. A leading figure of monetarism, he argued that inflation is essentially a monetary phenomenon and advocated a stable money-supply growth rule rather than discretionary monetary policy. He received the Nobel Memorial Prize in Economic Sciences in 1976. Author of Capitalism and Freedom (1962) and co-author, with his wife Rose Friedman, of Free to Choose (1980), he advised several governments, including the United States under the Reagan administration, and his influence extended to economic reforms carried out in Chile in the 1970s, an episode that remains controversial. He also contributed to the permanent income hypothesis and proposed the concept of a negative income tax.

James M. Buchanan

Born in 1919 in Murfreesboro, Tennessee, and died in 2013 in Blacksburg, Virginia, James McGill Buchanan founded, with Gordon Tullock, public choice theory, which applies the tools of economic analysis to political and administrative decision-making. A professor notably at the University of Virginia and later at Virginia

Tech, he is the founder of what is known as the Virginia School. His major work, *The Calculus of Consent* (1962), lays out the contractual and constitutional foundations of collective decision-making. He received the Nobel Memorial Prize in Economic Sciences in 1986 for his development of the contractual and constitutional bases for the theory of economic and political decision-making. His work has informed debates on constitutional fiscal rules and the limitation of governments' discretionary power over public spending.

Benjamin Graham

Born in 1894 in London and died in 1976 in Aix-en-Provence, Benjamin Graham emigrated to the United States as a child and built a career on Wall Street before becoming a professor at Columbia Business School. He is regarded as the founder of modern fundamental security analysis. With David Dodd, he published *Security Analysis* in 1934, the foundational work of the discipline, followed in 1949 by *The Intelligent Investor*, which introduced the concepts of margin of safety and intrinsic value, and the allegory of Mr. Market. He ran the investment firm Graham-Newman Corporation and was Warren Buffett's professor and mentor at Columbia. His method favours rigorous analysis of financial statements and rejects speculation based on market sentiment alone.

Olivier Blanchard

Born in 1948 in France, Olivier Blanchard is professor emeritus of economics at the Massachusetts Institute of Technology, where he taught for more than thirty years and chaired the economics department. He served as Chief Economist of the International Monetary Fund from September 2008 to September 2015, a period covering the global financial crisis and the European sovereign debt crisis. Since 2015 he has been a senior fellow at the Peterson Institute for International Economics in Washington. His recent work, notably his 2019 presidential address to the American Economic Association, addresses the sustainability of public debt when the real interest rate is below the economy's growth rate. He co-authored, with Jean Tirole, several reports for the French government on labour-market reform and social protection. Among the five experts personified in this dossier, he is the only one still living.

John Kenneth Galbraith

Born in 1908 in Iona Station, Ontario, and died in 2006 in Cambridge, Massachusetts, John Kenneth Galbraith was a professor of economics at Harvard University for most of his academic career. A major figure of Keynesian institutionalism, he held several official positions in the United States, notably at the Office of Price Administration during the Second World War, as well as serving as United States Ambassador to India from 1961 to 1963 under the Kennedy administration. He is the author of *The Affluent Society* (1958), which criticises the priority given to private consumption over public goods in wealthy societies, and of *The New Industrial State* (1967), which develops the concept of the technostructure to describe the power of large modern corporations that escape classical competitive discipline. He served as president of the American Economic Association in 1972 and received the Presidential Medal of Freedom twice, in 1946 and in 2000.

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