There are also many low-hanging fruits for the cutting of greenhouse gas emissions, in particular for waste management. A stronger focus on this is needed.

Conclusions

The EU's objectives on growth, energy, resource efficiency and climate change need to be the guiding principles of the EU budget. The EU budget is an important and effective tool to generate sustainable solutions towards these objectives at the European level. It is therefore important that member states change their blind requests for a smaller EU budget, or accept that a smaller EU budget would have to change priorities and negatively affect some traditional national beneficiaries.

For the EU to achieve its objectives it is recommended that:

- support for RDI is increased, particularly on energy, climate change and areas of resource efficiency; this support should be provided in the most appropriate form from the stage of basic research to the level of demonstration and deployment;
- support for trans-European and pan-European energy and transport links is boosted, with an emphasis on interconnectors and rail;
- through the guidance function of EU funding, the adoption of the best energy-efficiency practices is promoted, especially
  - the reinforcement of support for energy efficiency and renewable energy;
  - the introduction of best-practice conditionalities across all funding areas;
  - the introduction of energy-efficiency conditionalities and best practices in EU procurement rules;
  - support for the development of low-carbon cities and regions in the EU to test and promote new technologies on a large scale, and take advantage of the need to renew energy grids in new member states;
  - an increase in the EU's interventions on environmental matters, taking into consideration the need to protect ecosystems and promote resource efficiency.
- more resources are concentrated on waste management to reduce methane emissions more quickly.

Michel Aglietta and Jean-Charles Hourcade

Can Indebted Europe Afford Climate Policy? Can It Bail Out Its Debt Without Climate Policy?

Let us start with an unpleasant diagnosis for environmentalists. Many symptoms suggest that climate policies, although repeatedly reaffirmed by the European political institutions, might lose political support in many quarters of public opinion: criticism of the European Climate Roadmap, industry alerts against the adverse effects of tight carbon constraints on industrial employment, cuts in public subsidies to "green" energy sources, and the low electoral success of "green" parties compared with the rise of populist movements fuelled by unemployment and the middle classes' fears of falling behind.

This headwind is not surprising. Public opinion is troubled by two concomitant alerts: the tragic prophecies regarding the public debt, which put us in the inexorable hands of financial markets, and the climate risks which will be bequeathed to our children. These alerts arouse a "no way out" feeling. How can salary reductions, meagre retirement pensions and slimmed down public services prevent globalised markets from reproducing what they have created? The revolt against feelings of powerlessness has always fuelled populism; it currently threatens European political coherence and, ultimately, the climate policies which have historically been iconic of European world leadership.[1]

How can we navigate between the Charybdis of financial debt and the Scylla of climate debt? As with the Odyssean sailors, we need a mental map of the threats lying in wait. The first reflex might be to ignore the climate

1 C.C. Jaeger, T. Barker, O. Edenhofer, S. Faucheux, J.-C. Hourcade, B. Kasemir, M. O'Connord, M. Parry, I. Peters, J. Ravetz, J. Rotmans: Procedural leadership in climate policy: a European task, in: Global Environmental Change, Vol. 7, Issue 3, October 1997, pp. 195-203.

Scylla, at least temporarily. This paper explains why this reflex is inadequate and why a precise map of the threats can actually lead us to see climate policies as one of the ways out of the vicious circle described by Irving Fisher in 1933: "The more the debtors pay, the more they owe."[2] Recently, European Central Bank president Mario Draghi emphasised the necessity of complementing the current European fiscal compact with a growth compact. This paper explains why climate policies can be a central component of such a compact.

Behind the Debt Crisis, the Tensions Caused by Non-Sustainable Development Patterns

The debt crisis did not result solely from laxity in public finance. Since the 1980s, accounting and financial innovations had allowed for the creation of assets composed in part of debt. Unprecedented debt facilities were given to private lenders, especially non-bank banks[3] not subject to the prudential rules imposed on traditional banks. Both banks and non-bank banks were attracted by leveraged buy-outs and by what proved to be a trap – property speculation. The increase of real estate values first and foremost in the USA, imitated in several European countries, owed nothing to chance; it was allowed for, if not explicitly encouraged, by government policies.

Beneath the surface, there was the political necessity to hide the stagnation – indeed the drop – in the purchasing power of American households, which also explains Alan Greenspan's laxity as the chairman of the US Federal Reserve. This stagnation was caused by a pattern of economic globalisation that pressured the wage/labour productivity ratios in US industry through confrontation with foreign countries, including a Chinese industry boosted by the Deng Xiaoping reforms.

The commerce of promises was thus unleashed carelessly. It benefited from the internet bubble and crashed with the burst of the real estate bubble. Because the basic principle of the monetary economy is that credit creates deposits and because financial intermediaries have become tightly intertwined worldwide, the accumulation of "bad debts" in the United States and in some European countries spilled over throughout the world. A systemic shock in 2008 forced national governments to assume private debts, to bail out failing banks and to support collapsing economies. Subsequently, public indebtedness has risen to heights comparable to those provoked by wars. The US experience following World War II shows that debt levels corresponding to 120% of GDP can be absorbed over time without major trauma with a growth rate that is consistently higher than the average real interest rate paid on the debt. This is the difference that matters for orderly debt consolidation. The USA pursued a post-WWII policy of long-term stable inflation rates (around 3%) and a monetary policy aimed at producing negative real interest rates whenever possible.

The first lesson to be drawn from this is that in the aftermath of a major shock to public finances, monetary policy cannot be separated from fiscal policy. The second lesson is that growth is not manna from heaven; it requires specific financial conditions. This is the aim of Ben Bernanke's current policy of circumventing Congress's paralysis: short-term interest rates held close to zero for two more years and the purchase of as many Treasury bonds as necessary to tamp down long-run rates on government bonds so as to induce private investors to buy private assets.

On the other hand, history also tells us what should not be done. Between the two world wars, three waves of bank failures in the USA destroyed capital, triggering outflows of US deposits from banks in central Europe. Credit crunches plunged the US and German economies into depression, sealing the fate of the Weimar Republic and propelling the Nazis into power. In contemporary times, Japan has provided an example of a vicious cycle since the 1990s, when a premature budget austerity plan plunged the country into never-ending stagflation. When the private sector reduces its indebtedness through investment cuts, growth becomes crucially dependent on public investment or on public support for private investment.

The eurozone, grounded on the principle of independence between budget policies (conducted by member states) and monetary policy (conducted by an independent ECB), maintained a separation between its monetary policy doctrine on the one hand and its lender-of-last-resort operations to replace the failed interbank money markets on the other. However, the European crisis worsened markedly in the second half of 2011. Faced with very high interest rates on bonds in Italy and Spain, the devaluation of sovereign debts in bank balance sheets and the risk of an acute credit crunch in the autumn of 2011, the ECB injected around a trillion euros into banks' balance sheets via two auctions of long-term refinancing operations (LTRO) at a 1% interest rate over a three-year period.

2 I. Fisher: The debt-deflation theory of great depressions, in: Econometrica, Vol. 1, 1933, pp. 337-357, here p. 344.

3 P. Krugman: The return of depression economics and the crisis of 2008, New York 2009, WW Norton & Company, p. 224.

Thanks to this injection, sovereign bond market tensions concerning Italy and Spain were transitorily eased, though this respite did not last long. Credit in the private sector has not recovered, and the eurozone as a whole is drifting slowly into recession, threatening the policy of public finance consolidation.

So far the dominant vision of the growth austerity in Europe has been to couple restrictive fiscal policy with so-called structural policies in the labour markets in order to give confidence to financial markets. Lower long-term interest rates would thus trigger investments and enhance growth. This doctrine is based upon flimsy empirical evidence from small and very open economies which enjoyed the leeway of massively devaluing their currencies under conditions of supportive foreign demand. It is at odds with the current eurozone context: a very big and relatively closed economy overall, shackled by generalised austerity, the private sector of which is focused on deleveraging and is overly cautious when it comes to making industrial investments, all in a global economic climate that is not at all supportive.

Therefore it is not surprising that the mood is changing. Calls for active steps to induce growth momentum are no longer restricted to "heterodox" economists; they now come from official circles, not least from the ECB itself. But any attempt to instil a dose of Keynesianism to avoid a collapse of final demand now confronts two limits: it cannot, by itself, reverse the polarisation of industrial activities that has created the deep balance of payment problems within the eurozone, nor can it avoid reviving a development pattern the deadlocks of which have been revealed by the crisis.

Indeed, over the last few decades, the easy access to credit made it easy to ignore the warnings of the "ecological critique" first launched in the 1970s. These warnings were sometimes exaggerated, but they contained several pieces of truth: energy tensions confirmed by repeated oil shocks, frictions over raw materials, the dangers of agricultural modernisation based on industrial intensification, urban sprawl leading to socially exclusive cities with areas disconnected from dense public infrastructures, and technological risks, of which the Deepwater Horizon (BP) offshore oil spill in the Caribbean and the Fukushima accident are the most recent examples.

Therefore the challenge is to trigger a short-term economic recovery and to redirect the growth engine in order to safeguard sustainable development, avoiding heedless expansion phases that regularly collapse into socially costly crises.

Economic Recovery a Necessary but Insufficient Condition for Debt Bailout

Over the very short term, boosting growth through conventional credit facilities is problematic because public debt is contaminated by unrealised losses on the bank's balance sheets, while the banks are vulnerable to deteriorations in public finances. The restructuring of the public debt and the recapitalisation of the banks in certain countries are inescapable. This must be traded against reinforced prudential regulation in order to prevent banks' hazardous risk-taking when they gamble with their capital reserves in order to increase shareholder profits.

Furthermore, history suggests that a credible economic recovery in Europe implies revisiting the absolute separation of budgetary and monetary policies. We are not ignoring the deep differences of cultural attitudes in Europe in this respect. These have deep historical roots that cannot be eradicated overnight. A thin pathway exists, however, for a compromise which is not purely rhetorical and which would restore confidence and put an end to the risks of social splits and political crisis in many European countries.

The recently adopted "fiscal compact" marks some form of consensus that budgetary cooperation must be enforced in the eurozone in order to bring deviant management to heel. Organising the convergence of fiscal systems is also desirable in order to regulate fiscal competition, which potentially distorts the conditions of a "fair" concurrence. This cannot be achieved politically within the space of a few years, but our role as professional economists is to remind public opinion of this basic principle. The creation of an independent European agency to assess medium-term government projections of public finances in the cooperative procedure of the European Semesters is less politically constrained. The agency could provide – quasi as by-products – independent ratings backed by a much better analysis than the three US private rating agencies. More controversial at the present time is the issuing of Eurobonds to attract investors worldwide and to enable a significant decrease in interest rates where they are highest. Guarantees of repayment must be provided if this is to take place.

On paper, the setting of a European Finance Notation Agency should calm concerns about the Eurobonds. As its ratings translate judgments on the public sector's value production, sovereign countries would have every interest in being rigorous in their investment choices and in adopting the most efficient fiscal structures. If bonds finance independently assessed investment projects, these would have a high probability of paying for themselves, and a higher long-term growth would yield supplementary revenues for the states. These revenues would be sufficient to guarantee the solvency of the bonds with low Eurobond interest rates and avoid the creation of fiscal deficit over time.

But governments are not always virtuous and long-sighted. So isn't all this just so much pie in the sky? Eurobonds need to be backed by strong European governance at the very moment when the reactions to the Greek crisis show all too clearly the depth of suspicion among EU members. For the most "virtuous" countries that are concerned about the capacity of other member states to make optimal use of the allocated funds, the Eurobonds would open the way to a laxity that escapes discipline. The distrust is such that strong guarantees are needed to convince the sceptics that the money will be invested in an efficient manner, and in particular to reassure Germany, which is caught between its desire for drastic policies and its fears of a collapse of its neighbours and their markets.

Beyond the problem posed by this cycle of distrust, it is also important to consider the risks of reviving a growth model based on over-consumption fuelled by credit, on competition over salaries, on an agricultural transformation pathway which marginalises remote rural areas, wastes scarce water resources and destroys arable land, on contempt for environmental conservation, on rent-seeking in real estate, land and raw materials and on an energy security dependent on instable and costly geopolitical and military balances of power. A growth recovery launched on this basis would very quickly be confronted with oil shocks, speculative bubbles and splits in the social fabric.

This is why it is so important to deal jointly with the financial and the environmental debts instead of placing them in opposition to each other.

Debt Consolidation, Green Growth and the Buridan's Donkey Syndrome

Genuine rigor consists in seizing the necessary debt consolidation as an opportunity to transform environmental alerts into a long-term development project and to redirect savings and investments towards energy transition and an in-depth reshaping of EU industry: energy efficiency and low-carbon energies, housing renovation, transport infrastructure, health policies prioritising prevention, biotechnologies to underpin the ecological intensification of agriculture and the revival of remote rural areas, material recycling, infrastructures adapted to climate change, life-long investment in human resources.

Let us first recognise that nothing is self-evident and that our contention may remain a litany of pious sentiments. The creation of green jobs may come at the expense of the destruction of non-green jobs and could be slowed down by a lack of training in the new skills, by a deterioration in the balance of trade due to the importation of technologies "not made in Europe", and it could be stalled by controversies as to what is "clean" and what is "dirty". Nuclear energy has been subjected to an exacerbated form of such controversial discussions, as have biotechnologies and carbon sequestration.

The mutation towards sustainable development[4] cannot be delivered by a benevolent planner alone. Neither can it result from the manna from heaven dispensed by R&D investments, nor from the magic of the "market". It requires an iterative process of "trial and error" in multiple public and private initiatives. But this iterative process will never be launched in a context in which there is fear of unemployment and social disruption due to intolerable inequalities, and in which decision-makers are under the hypnosis of short-term myopia.

This is why there will be no green growth without coherent reforms of the fiscal and financial systems to jointly launch appropriate economic signals in order to redirect decisions and lubricate the inevitable frictions of any transition. Environmental tax reforms, including carbon taxes, are necessary in such a context. However, taxes depend almost entirely on decisions that have to be negotiated at the national level in order to account for the specifics of local conditions, and their empowerment cannot but be slow.[5] This is not the case for the adaptation of the financial system, which depends on global coordination and is critical for short-term economic recovery.

There is an urgent need to overhaul the structure of risk and returns on investment. During the last twenty years fiscal policy has pursued a single objective: reduction in the levels of taxation of capital with the aim of favouring

4 The World Commission on Environment and Development: Our Common Future, Report, 1987.

5 Significant carbon taxes pose problems for a few energy-intensive and exposed industries, which makes a harmonisation at the EU level useful. However, if the product of a carbon tax is recycled into lower labour taxes, this problem concerns a very minor part of the EU value added. This part is currently totally covered by the EU ETS. The most important obstacles to carbon taxes are thus country specific: the nature of the pre-existing fiscal systems and the adverse redistributive effects of higher energy prices.

short-term financial gains. At the same time, the business environment has led more and more industrial sectors to prioritise short-term shareholder value over the conventional maximisation of the long-term firm value. These industrial sectors indulged in this practice at the very moment when innovations in market finance led to an undervaluation of risk and a lack of transparency for savers. This resulted in strong incentives to redirect savings away from investments in industry and agriculture. The channelling of savings in the pursuit of capital gains explains the real estate bubble with unsold buildings in Spain and many other countries. This is the main driver of the paradox of a mountain of debt in a world with high savings (45% of GDP in China, petrol revenues, pension and sovereign funds).

These mechanisms created a Buridan's donkey[6] effect: as one does not know where to invest in production with high risk-adjusted returns, one refrains and speculates. Buridan's donkey dies hesitating between oats and a pail of water. A non-directed inflow of money comes to place more oats and water in front of it without breaking its hypnosis by a false calculus.

Carbon Value, Reforms of the Financial System and Economic Recovery

Responding to the challenge of energy transition under climate objectives provides a lever for breaking the Buridan's donkey syndrome by indicating where to invest. This lever is potentially strong because the sectors that are critical for climate change mitigation represent a dominant share of investments in our economies and are critical for social welfare: energy, transport, building, agriculture and basic industries. Providing that sufficient precautions are taken to avoid sacrificing other facets of environmental security[7], the low-carbon energy transition has the advantage that its operational planning can be articulated around a common metric, the carbon.

Carbon prices, whether in the form of taxes or of carbon-trading systems, have to play a role in this transition. But they cannot suffice to break the Buridan's donkey syndrome. They will stay low in the short term. The Durban Conference confirmed that an agreement with emission quotas for each country and market, setting a carbon price worldwide will be out of reach in the coming decade. This is why the Cancun agreement[8] called for a paradigm shift with finance at its heart.

Here lies the operational link between debt policy and a renewed climate policy. The only way of not losing the race against the cumulative effect of increased atmospheric concentration of greenhouse gases is an immediate reduction in the investment risk associated with low-carbon projects. To do so, an agreement on the social value of non-emitted carbon could be the cornerstone of a mechanism apt to reinforce the attractiveness of low-carbon investments compared to other investments, including financial ones.

Low-carbon projects currently present, in addition to the usual risks, those associated with less mature technologies, high capital costs and the uncertainties as to the price of carbon. Let us imagine a political agreement in Europe concerning a carbon value evolving with time. This value could be used to overcome the handicaps associated with low-carbon projects by enhancing their returns on investment and ensuring the necessary liquidities. The evaluation, the selection and the follow-up of such projects should be ensured by an independent entity, as is the case for the Climate Convention's Clean Development Mechanism.

A new class of assets, carbon assets, could be created by the European Central Bank. Their value would be the agreed carbon value, and carbon certificates could be emitted that could be used by development and investment banks to provide loans at preferential rates to low-carbon projects. These carbon certificates would then progressively be accepted by the central bank as a reserve asset (like gold), depending on the state of project completion as certified by the independent authority. Banks could in parallel issue "carbon" financial products, aimed at attracting domestic savers, thanks to a strong public guarantee, a return on investment slightly above that of usual safe deposits and, for part of the population to the "ethical" objective of the investment. They would thus be interested in using the credit facilities provided by the ECB to fund the economy instead of using them to restore their balance sheet.

Such schemes would obviate the risk associated with blind liquidity injection as the growth of carbon-based reserves would be concomitant with controlled wealth production (low-carbon infrastructures) and with the attraction of a portion of public savings away from specu-

6 Jean Buridan, a theologian at the Sorbonne in the 14th century, published a caricature of a donkey to illustrate his argument that it is wise to postpone decisions until all the necessary information is available.

7 For example, too much risk-taking on nuclear security or on bio-energy; all these risks can hardly be signalled only by price mechanisms and have to be tackled by adequate institutions and regulations.

8 Cancun hosted the Conference of the Parties to the Climate Convention in 2010. The Climate Convention was adopted by the United Nations in Rio in 1992; it contains the legal basis of climate negotiations.

lative products.[9] Henceforth the *commerce of promises* would continue but would be directed towards precise objectives. It cannot be suspected of causing “a carbon bubble”, as the value of carbon would be fixed by convention and not by the markets. The European Central Bank would pilot the system by determining the quantity of carbon assets as a function of the climate objectives of governments and of the validation of ongoing projects’ advancement.

There remains the problem associated with the initial injection of liquidity and of the contribution of institutional investors (mutual funds, life insurers, pension funds) who are by far the largest collectors of savings. This monetary mechanism needs to be articulated with non-banking intermediation through the setting up of a European Ecological Fund (EEF), perhaps under the European Investment Bank, which would issue bonds aimed at institutional investors. These would be Eurobonds that could be launched even in the absence of political agreement on “non-coloured” Eurobonds. The EEF would invest the revenues produced by these sales in a portfolio of “project bonds” and loans to banks to finance projects. To secure a triple A rating the EEF would need to have a public capital guarantee. Such capital could be raised at the European level by a small tax on financial transactions, justified on the basis that financial entities would, in the final analysis, benefit from the system, and by a small European carbon tax.

European Unity and European Leadership in Environmental Affairs

In the current context of destabilisation, tying consistent links between its macroeconomic and environmental policies would help Europe recover its unity. Germany has made the climate issue a major priority based on a strong political compromise. For historical reasons, it is far more sensitive than many of its neighbours to the laxity of monetary policies. It could thus find a system palatable which is submitted to double-checking (control of the money inflow through prices and volumes of carbon assets, physical reality of collateral of the credits controlled by an independent body).

Reviving the economy by means of such a device would indeed be economically sounder than repeated inflows of money to rescue the banking system with no incentive to invest. Moreover, the small European carbon tax could represent a share of domestically recycled carbon taxes set up by member states. These carbon taxes could be progressively matched among countries as a first step towards environmentally oriented fiscal harmonisation in the eurozone.

This climate-friendly financial architecture would help find the narrow pathway between extreme rigor, which would freeze economic growth, and extreme laxity, which would push the burden of debts onto future generations. It would transform the climate challenge into a lever for sustainable growth backed by a “green” content.

As a response to its short-term challenges, this link between climate policy and reforms of the financial system would enable Europe to make a credible offer to the Climate Convention for extending this system worldwide (with optional membership) and for meeting its Copenhagen commitment to pay into a Climate Fund. The natural allies of such a proposal are the emerging economies. In addition to their concerns about climate change damage, they have a long-term interest in avoiding the trap of energy dependence through the appropriate planning of their infrastructures and in limiting the possibilities of speculative bubbles that threaten them in turn. These countries will account for a dominant share (60%) of the infrastructure markets over the coming decades. If generalised, this system would help them to redirect part of their own savings towards endogenous growth that would be less export orientated. It would also help them to diversify their foreign exchange reserves, which they view as a major source of fragility in their current growth strategy. Indeed, it is possible that the carbon assets could be transformed into international reserve money[10], entering the calculation of the SDRs.

The last paragraph outlines avenues which might currently look premature, among other things because the geopolitical environment is critically dependent upon the result of the coming US elections. The first priority is, indeed, to deal with fears and distrust in the eurozone. However, to mobilise Europeans along this safe route between the Charybdis of the financial debt and the Scylla of the climate debt, it might be useful to keep in mind more positive and long-term objectives.

9 Especially if we seize this opportunity to control the access of hedge funds to the markets for petrol and basic commodities.

10 This was suggested by Governor Zhou of the People’s Bank of China in a web-based article just before the April 2009 G20 meeting. Recalling the vulnerabilities and systemic risks in the existing international monetary system, he calls for worldwide reflection on an international reserve currency anchored to a stable benchmark and argues in favour of reformed SDRs. About the link between the reform of the IMF and the climate affair, see H. Bredenkamp, C. Pattillo: Financing the Response to Climate Change, IMF Staff Position Note, 25 March 2010.