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New Globalization and Sustainability

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Abstract - This paper aims to analyze the implications for environmental sustainability of the recent phase of globalization. This phase, here called “new globalization”, has been specifically characterized by the spreading of the new economy that has accelerated the globalization of markets, and by the contemporaneous establishment of new rules of (de)regulation of the international markets, crucially managed and enforced by a new international institution: the WTO. This paper argues that the rise of the new economy has introduced new opportunities and new risks for sustainability that require appropriate actions, while the existing (de)regulation rules of the international markets jeopardize the sustainability of world development. In the context determined by the new globalization, environmental policy should shift in the direction of a new generation of knowledge-based instruments. This point is further clarified through a case study concerning the contribution of banks to sustainability in this new context.

Keywords: sustainable development, globalization, new economy, regulation of markets, green finance

J.E.L. codes: F01, F02, F18, 013, 033, Q32

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1. Introduction

The globalization of economic and financial activity that progressively consolidated in the last centuries increasingly undermined the environmental equilibriums of the biosphere not only at the local level (deforestation, desertification, pollution of rivers and seas, urban smog, etc.) but also more and more at the global level (global warming, depletion of the ozone layer, loss of biodiversity, exhaustion of crucial natural resources, and so on). This trend experienced ups and downs but the negative externalities of globalization continued to cumulate their effects. The acceleration of globalization after World War II has made clearly visible the gravity of the environmental degradation raising the issue of the *environmental sustainability of economic development at the world level* (from now on simply *sustainability*).[1]

Human activities often involved undesirable environmental effects even in the distant past, particularly wherever there was a spatial concentration of people for habitation or work. However, in the ancient world as well as in the Middle Age, the environmental problems were local, most of them affecting fairly restricted areas. In the classical period many problems raised by urban concentration were faced and solved: the towns of ancient Greece and of the Roman civilization had sewers for draining sewage, elevated aqueducts for distributing safe water, paved roads to avoid dust and mud, etc. Other environmental problems proved to be much more intractable and irreversible. For example, the extensive and systematic exploitation of North African forests for building and re-building large commercial and military fleets easily destroyed by storms and wars, produced an irreversible deforestation of this once very fertile area accelerating the expansion of the Sahara desert towards North. However, also in this case, the environmental problems were circumscribed to a particular, more or less wide, ecosystem and could be solved just by transferring the dwellings or the activities elsewhere.

The process of globalization started with the great explorations of the 16th and 17th centuries and strongly accelerated since the industrial revolution of the end of 18th century determined also the gradual globalization of environmental problems and a progressive awareness of their crucial importance. The ships of explorers opened the way to a web of commercial courses around the world, which progressively globalized trade and consequently production and distribution of goods. However, the scarcity of natural resources at the world level began to emerge only in consequence

[1] We accept throughout the paper the definition of 'sustainable development' suggested in the *Bruntland Report* (WCED, 1987): economic development is defined as sustainable whenever it satisfies the needs of current generations without jeopardizing the capabilities of future generations of satisfying their own needs. Of course this definition is too ambiguous to support serious

of the economic and demographic boom triggered by the first industrial revolution at the end of 18th century.[2] The growing impact of global markets upon the economic activity since the 1820s[3] accelerated the process of commodities and factor market integration, that increased worldwide at the same time the pace of economic growth and the stress over natural resources. By the end of 19th century it was understood that the worldwide exhaustion of crucial natural resources could jeopardize the continuation of growth.[4] A widespread awareness of the global nature of pollution emerged later on when the demographic explosion triggered by the industrial revolution virtually eliminated the existence of under-populated lands and connected the ever larger spots of pollution in an almost seamless web on land and sky. The temporary retreat from globalization during the World Wars and the period in between reduced the impact of global markets on economic development but did not interrupt completely the growth of world population, technical change, and global infrastructures (transport, telecommunication, energy nets, etc.) In addition the global environmental problems were seriously aggravated by the war destructions. After the 2nd World War the process of globalization of markets was resumed and affected more and more the environmental and social sustainability of world development.

The globalization of environmental problems has undermined the viability of their traditional solution: just 'moving away' towards a new unspoilt environment. Scarcity of resources were overcome by migrating, by setting colonies, by looking for new sources of vital resources (mines, food, clean water, etc.) and by extending commerce to distant lands. In particular, the nomadic populations overcame exhaustion of resources and pollution by continuous migrations aiming at new unspoiled habitats.[5] But as soon as it became clear, quite recently, that there are no

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analytical work so that it must be translated in more precise operational definitions (a brief critical survey on the existing alternatives may be found in Vercelli, 1998a).

[2] The nature of the problem was clearly perceived by Malthus, although his calculations were soon proved to be mistaken, mainly because of his under-valuation of the effects of technical progress.

[3] The globalization of markets in its modern meaning may be considered to start in the 1820s when a clear trend towards commodity price convergence begins to emerge in the international markets (O'Rourke-Williamson, 2000) and a widespread epochal move towards liberal policies begins to spread (see Lindert and Williamson, 2000).

[4] One of the first scholars who understood this problem was the great British economist Stanley Jevons who analyzed the risk of exhaustion of coal (1865) that was then the main source of energy for the industrial activity, and its potential catastrophic consequences for the continuation of growth. Even Jevons's calculations were wrong because of his underestimation of the opportunities offered by technical change and substitution with other energy sources, but the potential relationship between sustainability of development and scarcity of resources resulted greatly clarified by his groundbreaking contribution.

[5] Even recently the epos of "far west", when in the USA the new frontier progressively shifted towards the Pacific, was nothing but the progressive search for new unspoiled natural resources. Appropriately the traditional attitude towards the environment was vividly defined by Boulding (1966) the point of view of the *cowboy*. But as soon as it became clear, quite recently, that there is

unspoiled natural resources left, their sustainable exploitation becomes a necessary prerequisite for further economic development.[6]

After the 2nd World War the process of globalization was strongly supported by international economic policies. In particular a series of intense GATT rounds progressively dismantled the tariffs and the other protectionist obstacles to international trade and soon recovered the level of globalization already reached at the end of 19th century and then lost by the process of de-globalization of the first half of 20th century. Since the mid-1970s, the breakdown of the Bretton Woods system of fixed exchange rates triggered a progressive acceleration of the collapse of national boundaries realizing a new international order based on the systematic globalization of economic markets. In the early 1990s the Uruguay rounds pushed forward the legal and institutional foundations of global free trade to be monitored and managed by the World Trade Organization that started its activity in 1995. In the late 1990s the range of freely exchangeable goods was greatly increased to include also most immaterial products such as software, copyrights, patents and insurance. WTO, with the help of the multilateral investment agreements negotiated by the OECD, managed to remove almost completely also the controls on the movements of capital, including direct foreign investment and financial flows, by imposing on each state the obligation to grant the same rights to domestic and foreign investors. The progressive extension and deepening of international free trade translated in rapidly growing global markets also by profiting of the new ICT infrastructures, material (the web of international transports, ICT hardware such as telephone lines, television channels, communication satellites, and so on) and immaterial (ICT software, internet, and so on).

This paper intends to focus specifically on the implications for sustainability of the most recent phase of the post-war process of globalization that we are going to call "**new globalization**", i.e. the phase -- from about 1995 (when the new economy started to spread and the WTO was founded) to the end of the past Millenium -- characterized by the systematic application of ICT technologies to the production and distribution exploiting the new opportunities offered by Internet, and by the adoption of new (de)regulation rules of international markets crucially managed and enforced by WTO. While the traditional globalization was propelled by the increasing mobility of goods, energy and capital, the new globalization is mainly propelled by the increasing mobility of information through the worldwide web of Internet connections. The progressive fall of cost and

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no new frontier left, the only possibility of continuing some sort of economic development depends on the adoption of a new point of view that regards the earth as a *spaceship* whose resources must be very carefully managed as a whole in order to permit the continuation of life on it

[6] (a crucial contribution to a greater awareness of these problems came from the epoch-making publication in 1972 of *The limits to growth*).

time required to access information throughout the world started a radical transformation in the structure of production of goods and trade also at the world level, which deeply affected also the process of globalization. Though, after the failure of the Millenium Round of WTO in Seattle at the end of 1999, and the deep crisis of the new economy it is still unclear to what extent the process of new globalization will be modified in the near future, it is important to understand the implications for sustainability associated to the specific features of new globalization in order to orientate its change in the best possible direction. The following analysis aims to clarify a few basic requisites for implementing a process that could be called of **sustainable globalization**, i.e. a process of globalization fully consistent with sustainable development at the world level. To this end this paper focuses on the new dangers and opportunities brought about by the process of new globalization for conciliating the health of the biosphere with sustainable world development.

The structure of the paper is as follows. The second section aims to provide some background for the analysis of the properties of global markets with particular reference to the environmental implications. The focus of the analysis then shifts on the novelties of the most recent process of globalization, i.e. the spreading of the new economy that offers a few favorable opportunities for sustainability (briefly spelled out in the third section) but involves also a few serious risks (briefly discussed in the fourth section). The fifth section suggests a few tentative policy implications of the preceding analysis. The sixth section aims to clarify what specific contribution banks may give to sustainability within the conceptual framework put forward in this paper. A few concluding remarks follow.

2 The globalization of environmental problems: some background on global markets and their regulation

The process of new globalization is of course very complex and multifaceted. In this paper we are bound to restrict the focus only to some limited aspects that have strict implications for the health of the biosphere from the point of view of the contribution that may be given by the financial system. However, to this end, we need some background on a few issues and problems raised by the global evolution of markets.

The modern process of globalization of the world economy has been and is in its essence a process of globalization of markets. The globalization of trade, propelled by the increasing efficiency of transport means since the industrial revolution (steam ships, railways, cars, aircrafts, and so on) progressively affected the production and distribution of goods in an increasingly wider area of the globe. The international mobility of goods was enhanced by the increasing mobility of

capital and, to some extent, labor. In consequence of this process, the economic and financial decisions became more and more ruled by market principles rather than by alternative principles which were very influential in local communities, including ethical principles (solidarity, equity, reciprocity, etc.) The increasing extension and power of markets produced desirable consequences such as the increasing efficiency of productive and financial processes, the accelerating growth of world production and of average per capita income (see fig.2), the worldwide access to global resources; however it has been *accompanied* also by a few undesirable phenomena such as the increasing inequality between nations and, to some extent, within nations (see fig 1), increasing poverty (see World Bank, 2001), a widening gap between the North and the South of the globe,[7] loss of cultural diversity, exhaustion of natural resources, and pollution at the world level. The correlation between globalization and undesirable phenomena such as those just mentioned, that has been ignored or de-emphasized for too long, is now at the center of the public debate, also because the 'Seattle movement' has contributed to attract the attention on it (see Wallach-Sforza, 1999). However, it is very difficult to assess whether these and other undesirable phenomena, which have accompanied the recent process of globalization, are actually *caused* by some intrinsic feature of the process of globalization or by some external or extrinsic feature that may be removed. Unfortunately, the heated debate on these issues has taken too often, at least in the mass-media, the misleading form of a poll for or against globalization, i.e. whether to stop and\or reverse the process of globalization or allow it to proceed along the existing lines. In our opinion the negative phenomena associated with globalization are not unavoidable consequences of globalization in itself, while the reversal of globalization is to some extent possible but does not seem to be the right solution to the problems. In order to clarify this point of view we have to recall, as briefly as possible, a few basic points suggested by economic theory.

We do not know much about the structural and welfare implications of the actual behavior of *real* markets and therefore even less about the causal nexus between the globalization of real markets and pathological global phenomena such as those mentioned above. However we know enough about the implications for real markets of the abstract models of competitive markets for excluding that the way out from these pathological phenomena may be found either by stopping (or worse by reversing) the process of globalization or by just letting it go as it is.

In particular, we know that a perfectly competitive market performs the optimal allocation of resources given a certain initial distribution of resources and wealth among agents, their tastes, and

[7] It has been calculated by UNDP that the ratio between the income of the fifth of the world population living in the poorest countries and the fifth living in the richest countries constantly and rapidly deteriorated in the last decades from 1\30 in 1960 to 1\60 in 1990 to 1\74 in 1997 (UNDP, 1999).

a well-specified technology. This implies that problems concerning the distribution of resources, income and wealth, cannot be solved by unregulated markets and are not determined by them alone, either. Equal initial opportunities for all the agents and a fair distribution of income and wealth among them may be assured only by apt policies. In addition, a competitive market realizes the optimal allocation of resources among alternative uses only under very stringent assumptions underlying the abstract model of perfect competition, namely: completeness of markets, zero transaction costs, absence of serious uncertainty that is guaranteed only when the agents have perfect foresight or rational expectations, sufficient thickness and extension of markets that is assured in principle only when the number of traders tends to infinity, absence of externalities (including the environmental externalities), and stability of markets. The trouble is that real markets do not comply with these conditions. However, in principle, the process of globalization pushes the real markets closer to the abstract model of perfect competition; therefore it improves the economic and financial efficiency of markets by enhancing their extension and thickness. However the allocation of resources of unregulated global markets cannot be considered optimal for a host of reasons:

- The *uncertainty* intrinsic in the working of the markets raises serious problems. In particular it implies that the expectations of economic agents are neither in general correct nor rational (see, e.g., Shiller, 2000).
- Markets are *incomplete*; in particular most future markets are missing and cannot be easily established. What is worse, it can be proved that in principle markets cannot be made complete,[8] in particular as far as future markets are concerned; in any case, the optimal intertemporal allocation of resources cannot be realized by real markets even if they are relatively competitive because most future markets are missing and the more do expectations refer to the distant future the more they are liable to be systematically incorrect.
- *Externalities* are important because markets are incomplete and therefore cannot register all the costs and benefits of economic decisions, and because the property rights on goods and resources are not always well defined, as is typical with many environmental resources such as the global commons (water, air, biodiversity, etc.)

[8] For a brief discussion of this issue with a few selected references see Vercelli (1998a).

- *Transaction costs* are often quite sizeable. In particular the costs necessary to put in touch demand and supply may involve significant material costs, such as travel costs, or immaterial costs, such as those involved by the gathering and elaboration of information about the relevant characteristics of potential demand and supply.
- There are a few important markets that are fairly *unstable* from three different points of view. Competitive markets tend to be *institutionally* unstable in the sense that they tend to lose their competitive nature as a consequence of the exploitation of scale and scope economies, or of discretionary power in disequilibria, or of monopolist and oligopolist practices. In addition markets may be *dynamically* unstable in the sense that they do not recover easily the equilibrium position whenever they are displaced from it by a shock. Finally markets may be *structurally* unstable in the sense that a small shock may alter the qualitative characteristics of their dynamic behavior.[9]

We must conclude that for sound well-known reasons global markets cannot be left unregulated. Regulation is necessary for maintaining and perfecting competition, improving intertemporal allocation of resources (in particular the intergenerational distribution of resources), reducing uncertainty and mitigating its effects, internalizing externalities. In addition, as argued above, the distribution of resources, income, and wealth cannot be left to unregulated global markets because even perfectly competitive markets cannot assure their fairness.

The trouble is that, if market failures require some amount of regulation, the failures of regulation are not less harmful. Both the experience and the theoretical analysis of bureaucratic and political processes have shown that the failures of regulation are systematic and may be even worse than those of the markets. In addition the failures of regulation are much more visible than the market failures that they are supposed to mend. Therefore the disillusionment on the efficiency of regulation has been so strong that an irrational faith has spread, particularly since the 70s, on the power of unregulated markets. The ensuing process of deregulation has been successful in dismantling many degenerated forms of regulation and must go on to this end, but in a few cases it has gone too far, dismantling also the necessary forms of regulation such as those that set environmental, sanitary, humanitarian and ethical standards. In addition the relationship between regulators and regulated agents proved to be a sort of evolutionary game: the regulated agents always try to elude the rules set by the regulators who must therefore continuously update these rules. Therefore a continuous process of re-regulation must accompany the process of deregulation meant to dismantle obsolete or inefficient rules in order to introduce the most efficient minimal

[9] See Vercelli (1991) for a discussion of the different concepts of instability.

necessary rules in the evolving context. However, the mistrust in regulation has gone so far to cloud the necessity of regulating the markets. Of course the regulation of markets must be kept to a minimum level in order to avoid as far as possible the disruptive potential of regulation failures but cannot be altogether absent.

The main troubles with globalization arise exactly because the regulation of global markets is inefficient and is exerted in an unsatisfactory way. The local regulating institutions have been progressively displaced and weakened by the process of globalization. As for the international organizations, the system of UN institutions succeeded to some extent to upgrade the humanitarian, social, and environmental standards of economic activity but the active and democratic participation of the people of member countries (particularly in developing countries) is wanting because of their institutional structure and increasingly frequent de-legitimizing actions from some of the member countries. Also the international institutions designed at Bretton Woods to regulate the post-war world economy (IMF and World Bank) have been increasingly criticized for the questionable criteria of their interventions. However, while the system of active *regulation* of global markets has been progressively weakened and de-legitimized, the process of their *deregulation* has been progressively strengthened by the GATT agreements that have culminated in the Uruguay Round and in the institution in 1995 of WTO. In the first years of its activity (1995-99) the WTO contributed very much to the acceleration of the deregulation of global markets, but its power, which proved to be very effective, was exerted without the necessary transparency, accountability, and active participation of the stakeholders, even those living in the member countries, sweeping away many humanitarian, social, and environmental standards introduced by the most advanced national legislations and multilateral agreements (see Wallach-Sforza, 1999, for an impressive list of examples), even when they had been supported by other international organizations (Undp, Unep, Unesco, Oil, Oms, Fao, etc.) This model of regulation of global markets that relies almost exclusively on bureaucratic super-national deregulation and the systematic elimination of humanitarian, social, and environmental standards is inconsistent with ethics, democracy, and the social and environmental sustainability of development at the world level. This does not imply that globalization should be stopped or reversed. Inward-oriented policies (e.g. protectionist measures) may shield production and employment in the short period from external shocks only at the cost of shrinking the opportunities for domestic enterprises to innovate and increase productivity, and of enhancing at the same time harmful regulation by local authorities increasing the scope of regulation failures. The history of twentieth century confirms that. The retreat from globalization started with the World War I, strengthened by the crisis of the 1930s, and protracted by World War II, badly hit all regions and in particular developing countries. Similarly in the 1970s and 1980s the

Latin American and African countries that adopted inward-oriented policies lagged behind the world growth, while the countries of Asia that adopted in the same period outward-oriented policies became one of the most dynamic areas in the world economy. However a viable model of sustainable globalization requires a radical reform of the institutions having the responsibility of regulating the global markets which assures their transparency and accountability, as well as the democratic participation of member countries and stakeholders, and the progressive upgrading of ethical and environmental standards of global economic activity.

This general perspective on the properties of competitive markets and the need of a, minimal but efficient, regulation applies in particular to the environmental problems because:

- *Uncertainty* is particularly serious since the interaction between the biosphere and economic development is extremely complex.[10]
- Markets for environmental resources are highly *incomplete* since property rights on natural resources are often undefined, and missing future markets particularly relevant for sustainability that involves very long-term intergenerational considerations.
- For the above reasons *externalities* are bound to have a crucial role in this field. Strong uncertainty and missing markets prevent a fair assessment of environmental costs and benefits by the actual system of unregulated markets. Property rights may be partially substituted by pollution marketable permits but the transaction costs for establishing them are initially very high and are unlikely to be carried on spontaneously by unregulated markets.
- Even *instability* may be specifically important in certain cases. Because of their long-term nature environmental investment is not considered a priority when a crisis develops or whenever the relevant prices are volatile. For example the marked volatility of the price of oil has discouraged serious long-term investment for substituting its use with renewable and\or less polluting sources of energy.

In the sequel of this paper we aim to consider how the new globalization may be governed exclusively from the point of view of environmental sustainability.

[10] See Vercelli (1997, 1998a) and Basili-Vercelli (1998).

3 New economy and sustainability

The process of globalization started after World War II has not been very different from that of the second half of 19th century, as it was propelled by a rapid expansion of world trade made possible by the continuous improvement of transport means and a progressive reduction of protectionist measures. However in the late 1990s a profound transformation in the organization of production and distribution of goods and services started in the more advanced economies (in particular in North America and Europe) rapidly spreading in the most advanced economies and substantially affecting the process of globalization itself. The worldwide web of economic exchanges and relations typical of the traditional process of globalization has become more and more entrenched in, and ruled by, the worldwide web of information transmitted and processed through Internet. We may call this new way of organizing the economy 'new economy'[11].

In principle, the new economy may push real markets closer to the abstract model of perfect competition. This may happen in particular because:

- It may reduce the *information asymmetry* between potential traders by offering, in principle to every agent concerned, cheap access to economic and financial information.[12]
- It often reduces the *transaction costs* necessary to realize the 'double coincidence of wants' among traders, i.e. the matching between demand and supply, in particular by reducing the searching costs.
- It may reduce the *barriers to entry* in the market for new enterprises since, e.g., it is much cheaper to set up a new business wholly or partially online than a traditional brick-and-mortar shop or office, and because it is easier for the would-be entrepreneur to gather all the necessary technological, bureaucratic and commercial information for starting up the new business; it may be also easier to find the necessary start-up capital also because the supply of venture capital has been stimulated by the spreading of the new economy.
- It may reduce the existing *scale and scope economies* in the productive and distributive sectors. This depends in particular on the interaction between the points just mentioned above. In particular the reduction of information asymmetry and transaction costs removes the main reasons for vertical integration (Coase, 1960) and encourages each firm to specialize in its core business by outsourcing the acquisition of all the required goods and services. Though ICT also

[11] We use this expression throughout the paper not in the sectional sense of set of activities directly concerned with the supply of ICT hardware, software, and services, but in the systemic sense of the new organisation of the economy as a whole in consequence of the systematic application of ICT.
[12] See section 6 for a few important qualifications to this assertion.

offers new occasions of scale and scope economies related to the growing role of virtual networks[13] and the increasing importance of the gate-keeper that regulates the access to them,[14] the reduction of the barriers to entry coupled with the increasing velocity of technical change assures some degree of contestability also in the sectors more affected by tendencies towards natural monopoly.

- It may reduce the *average size of enterprises* since in many sectors the small and medium enterprises have more chances of survival and growth. This depends not only on the points mentioned above but also on the reduction of the comparative disadvantages of SME vis-à-vis big enterprises, and on the contemporaneous increase of their comparative advantages. Among the reasons for diminishing comparative disadvantages it can be mentioned the easier access to global information even about distant markets, the easier access to technological information through the burgeoning societies of technological transfer and advice, and the new possibilities of distribution of goods and services through e-commerce. Among the increasing competitive advantages it may be mentioned the increasing value of the flexibility typical of small dimensions in markets that evolve always more rapidly (see, e.g., Vercelli, 1989).
- It increases the *power of the final user of goods and services* by increasing their customization and the transparency of their prices. The so-called 'sovereignty of the consumer' (or, more in general, of the final user) long since stressed in the economics textbooks may now become more realistic than it was before.

Summing up, it is reasonable to suppose that, to the extent that the new economy affects real markets in the direction of the pure model of competitive markets, in principle it improves the allocation of economic resources, i.e. economic efficiency. This is relevant also for sustainability. More efficiency implies that the same amount of goods and services may be produced with fewer resources, including exhaustible natural resources, and with less pollution. However economic efficiency is a necessary but not sufficient condition of *eco-efficiency* (see in particular Schmideyni and Zorraquin, 1966) since we have to consider also the environmental externalities. Fortunately the spreading of the new economy offers many opportunities for enhancing also the eco-efficiency of economic processes. The basic reason is that knowledge is becoming more and more the principal factor of production and knowledge does not in itself pollute or waste natural resources. In particular the spreading of the new economy:

[13] As is well known the size of networks is characterized by increasing returns. According to the Metcalfe's law of networks the usefulness of a network is equal to the square of the number of users.

[14] This point has been emphasized by Rifkin, 2000.

- Provides new opportunities for reducing *energy consumption*. First of all, the systematic application of ICT to all the economic sectors is sizably increasing the total factor productivity. In the USA, e.g., it was estimated that ITC was the key factor in the sizeable acceleration of productivity growth in the late 1990s, since two-thirds of it was due directly to the production and investment in ICT; in more detail nearly half of the acceleration in productivity growth was due to capital deepening produced by the investment in ICT, while the other half was due to faster total factor productivity growth of which two-fifths depends on the growth in efficiency in the ICT sector itself (see Woodall, 2000, p.14). In addition the spreading of the new economy may accelerate the reduction in energy intensity, measured in energy consumed per dollar of gross domestic product. In the USA, e.g., the rate of reduction in energy intensity has increased from the 1% of the early 1990s to the 3%, in part (about 1\3d) for structural reasons (growing weight of the ICT sector that is relatively less energy intensive) and in part (almost 2\3ds, taking account of a small statistical residual) because of gains in the energy efficiency of all sectors made possible by the systematic introduction of ICT (see, e.g., next point). This has produced a substantial stabilization in the emissions of greenhouse gases notwithstanding the strong rate of growth of the economy (see Romm, Rosenfeld, and Herrmann, 2000, p.5).[15]
- Gives a great impulse to the *dematerialization* of the process of production and distribution of goods. This is due first of all to the process of substitution of electronic files for material goods and services (a process that has been called *e-materialization*). A case in point is the use of paper that is currently substituted by e-mail, electronic catalogues, e-books, etc. The *paperless office* has been already realized in a few high-tech firms, such as Microsoft (see Gates, 1999). Any reduction in the use of paper is welcome for improving sustainability because the manufacture of paper is one of the most dangerous industrial sectors as it puts pressure on a very crucial scarce resource as forests while at the same time it pollutes very much.[16] The

[15] The spreading of the new economy may also have negative effects on the consumption of energy since it encourages the systematic use of electronic devices at home and at the workplace. Therefore there is no guarantee that the positive net effect observed in the USA in the late 1990s is bound to persist in this country, and to occur in other countries. In order to obtain these results, active policies must be pursued. An example are the incentives offered in the USA by EPA for the adoption of microchips that switch off automatically when not in use.

[16] The process of dematerialization may give a great contribution to the reduction of energy consumption. It has been estimated that the e-materialisation of paper alone may cut energy consumption in the USA by 2003 by about 0.25% (see Romm, et al., 1999). However it must be stressed that the introduction of ICT devices does not necessarily imply e-materialization. For example, if the successive drafts of an electronic file are systematically printed (for correction, comments, record, etc.) the net use of paper may increase. In order to avoid that it is necessary to

reduction of warehouse and office space made possible by ICT may give another great contribution to dematerialization (see fig.3 for an estimate of the impact of e-materialization in the paper and construction manufacturing sectors in the USA).

- Promotes *telework* that is assuming a prominent role in many high-tech enterprises. For example, 56 % of AT&T employees work at least partly at home with a reported increase in productivity and job satisfaction. As a consequence ‘ the company has saved $ 1bn in real estate costs in the five years since the telework experiment began and estimates it achieved a 55,000-tonne cut in carbon dioxide emissions last year from reduced commuting’ (Goodman, 2000, 35).
- Contributes to match, mainly through the progressive development of *e-commerce*, better and more rapidly demand and supply of goods and services, reducing the costs for searching the right supplier or for reaching the potential customers, while increasing the satisfaction of the client. This virtually eliminates the risk of unsold goods, reducing the size of *inventories* and therefore also the need of *warehouse space*, and allows huge savings in square feet, electricity, natural gas, and greenhouse gas emissions (for an estimate concerning the USA, see fig.4).[17]

We may conclude this section by observing that the spreading of the new economy is offering many important opportunities for enhancing the sustainability of development. However the impact of the new economy on the process of globalization has also dangerous implications for sustainability that we are going to consider in the next section.

4 New globalization and sustainability: opportunities and risks

The process of ‘new globalization’ carried with it new opportunities for preserving the health of the biosphere and enhancing the sustainability of world economic development, in part already mentioned in the preceding section, but it involved also a few serious risks that are examined in this section.

The new globalization of real markets ceteris paribus may accelerate the pace of growth at the world level to the extent that it improves the allocation of resources at the global scale. This in

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intervene with active policies such as those already successfully pursued by the firms that have realized fully paperless offices (see, e.g., Gates, 1999).

[17] Also in this case the environmental benefits of e-commerce are not automatic. The individual packaging and shipping of goods from a possibly distant country may increase the environmental costs of the distribution of goods (fuel, pollution, waste, etc.) In order to avoid this consistent active policies must be implemented, such as those already successfully introduced in Germany and other countries for curbing the abuse of packaging..

itself tends to deteriorate the quality of the environment (see fig.5). This depends on the growing negative environmental externalities of the economic activity at the world level (fig.6) since more natural resources are used and more pollution is released in the biosphere (for the evidential underpinnings of this stylized representation see, e.g., De Bruyn et al, 1998). However, the nexus between economic growth and negative externalities may be shifted in a favorable direction (downwards in fig.6) as new technologies and policy measures change the structure of the natural inputs and of the outputs emitted in the natural media. As a consequence of these shifts the relationship between the stage of development (somehow measured by per capita income) and global natural externalities may well become positive after a certain threshold as the environmental awareness and the technological know-how improve (fig.7). In particular the globalization of information strongly accelerated by the spreading of the new economy allows the introduction of the best environmental practices all over the world and therefore it shifts the trade-off between the rate of growth and sustainability in a favorable direction (upward in fig.8).[18] The net effect may eventually become positive provided that the favorable shift of the trade-off mentioned above is pushed with vigor by the growing environmental awareness of the final users of goods and services and by apt environmental policies (see the next section). In addition the transfer of technological knowledge and know how from leader economies allows the followers to pursue a similar pattern of development in a more favorable position.

A case in point is that of energy. In principle more growth implies more energy consumption and therefore more rapid exhaustion of resources (such as oil) and more pollution. This problem is aggravated by the increase in energy intensity that has been observed in all the countries in the early stages of development. However in the most developed countries the empirical evidence suggests that in the long run the growth of energy intensity tends to slow down eventually reversing itself (see fig.9). In addition the inverted-U curve may shift in a more favorable direction for the followers as a consequence of the transmission of technological expertise and know-how from leaders to followers (see ibidem).[19] The exceptions represented by the ex-Soviet countries, China, and developing countries suggests that in these cases, though for different reasons, the transfer of

[18] Though in principle sustainability may be measured (see Vercelli, 1998a), reliable sustainability measures at the world level are still beyond state-of-the-art capabilities.

[19] The inverted-U relationship between development end environmental degradation is often called in the literature 'environmental Kuznets curve' (see Borghesi, 1999, for a lucid survey of the extensive literature, and Vinod, et al., 2000, chap.4, for a few recent comments). It is important to stress that, even when a Kuznets curve may be detected in the available empirical evidence, it would be extremely misleading to interpret it in deterministic terms. The favourable inversion of the trend of environmental degradation may be reached and maintained only if all the relevant subjects (consumers, savers, investors, firms, and policy authorities) act, and continue to act, consistently with long-run sustainability (see de Bruyn, et al., 1998, and Unruh-Moomaw, 1998).

technologies and know how was slow and inefficient. This observation suggests that the beneficial transfer of knowledge from the most advanced economies to the other economies may be much accelerated by the spreading of the new economy in the less developed countries and by apt transboundary policies aimed to exploit the new opportunities.[20]

The new globalization of financial markets produced huge effects. In principle, every one has easy and prompt access to these markets through Internet (connecting from home or from everywhere, even walking in a street, through a WAP portable telephone) and may exchange stocks all over the world without interruption. This fostered the emergence of a virtually unified stock-exchange market at the world level greatly increasing the number of traders, including a soaring number of amateurs among them, and sharply reducing the transaction costs. In addition an increasing amount of information was made available on the net for every one interested virtually eliminating information asymmetry. As a consequence we have more competitive global financial markets that may improve the allocation of financial capital with beneficial fallout on the real side (e.g. more availability of venture capital for new entrepreneurial ideas). However the global financial markets exhibit also huge problems.

First of all globalized financial markets are liable to be more unstable. The main trouble so far is not with what we have called above *institutional* instability (see retro section 2). A huge process of M&A increased the size of the main global financial operators, but at same time the new economy offered new opportunities of growth also to the most dynamic small operators. However, if the process of concentration will continue to be insufficiently regulated at the world level it could eventually jeopardize competition as soon as the 'natural' contestability of financial markets will begin to weaken. In any case the *dynamic* and *structural* instability of financial markets has greatly increased in the last decades in consequence of the process of globalization and it has further accelerated in consequence of the spreading of the new economy. This has been clearly revealed by a sequence of dramatic financial crises with serious global repercussions (EMS, 1992, Mexico, 1994, Far East Asia 1997-98, Russia, 1998, Brazil, 1999). In addition, the volatility of stock prices has greatly increased in recent years (see Shiller, 2000). The main reason may be found in the growing impact of the so-called 'herd behavior' of traders on stock prices as the size of the herd progressively soared, and the impact of a weak regulation of markets at the world level became more and more evident. The trouble is that the increase of the volatility and instability of financial markets strengthens the tendency towards a rapid and marked shortening of the decision horizon. The size of returns involved in successful speculation is becoming so big as compared to the returns

[20] Where this process has been recently strengthened very promising results have been rapidly obtained: in the eastern European countries in all the fields, in the case of China and most

involved in long-run entrepreneurial decisions that too much capital, resources and energies are shifted towards short-term trading and speculation. This increasing short-termism is the crucial issue raised by the new globalization process; though the process has started long ago,[21] it is now greatly strengthened by the current process of new globalization. Financial bubbles, financial crises, and many negative externalities of economic growth depend on it. In particular, there is a strong empirical evidence suggesting that greater volatility in capital markets brings about greater volatility in GDP growth rates (see fig.10) that is correlated in its turn with slower average growth (Vinod, et al., 2000, p.12), increase in poverty (ibidem), and negative externalities including environmental degradation. In addition short-termism brings about an irrational overvaluation of current values, costs and benefits and undervaluation of future values, costs and benefits that is clearly inconsistent with decisions compatible with sustainable development. In particular this attitude has strengthened the implementation of grow-now-clean-later policies that have disastrous effects for sustainability.[22]

A further crucial problem raised by the current process of new globalization is a weakening of business ethics.[23] This is strictly connected with the increasing short-termism. The rational foundations of ethics are very much based on the repression of behavior committed to short-term goals in view of longer-term goals. For example, drugs, alcohol and smoke may give an immediate sense of satisfaction but only to the expense of 'sustainable health'. The same is true when the interests of other people are involved by a certain decision: it is possible to obtain immediate advantages by damaging other people but only stimulating at the same time disruptive retaliation or breaking the basic structure of markets and society that requires trust (Sen, 1999).

The increasing short-termism and weakening of business ethics affect both real and financial global markets and are undermining the social and environmental sustainability of growth at the world level. Since a complete evaluation of environmental costs and benefits requires a long time horizon, the economic decisions, in the absence of incisive environmental regulations, tend to be increasingly biased against sustainability.

Fortunately there are countervailing tendencies that may be further reinforced through apt policies. In our opinion the weakening of ethic awareness and responsibility (in particular as far as business and environmental ethics are concerned) is not as deep and pervasive as it may seem at

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developing countries in the field of water processing (see Vinod, et al., 2000).

[21] On this point the analysis carried on by Keynes in the *General Theory* (1936, mainly in the celebrated chap.12) is still quite up-to-date.

[22] The fact that East Asia experienced in the 1990s at the same time the fastest rates of growth of GDP, the fastest rate of deforestation, and the highest carbon dioxide emissions per capita is a case in point (see Vinod, et al., 2000, p.9 and chap.4).

[23] This fact is emphasized also by a few well-known insiders such as Soros (1998).

first sight. As a matter of fact, in recent times for historical reasons, the concern for ethics has shifted from the traditional forms of expression towards new forms. Disillusionment towards the political process and public institutions has shifted the ethical commitment of people towards voluntary service, charities, and NGOs. As for the productive process the ethical focus has shifted towards a more acceptable use of profits rather than on the means to produce them, as is shown, e.g., by the sizeable growth in number and size of humanitarian foundations. However also the productive process is affected by these shifts in the form of rapid growth of the so-called 'no profit sector'. In addition, in the private sector itself there are new developments that may offset the mounting short-termism. While *stockholders* tend to become increasingly sensitive to short-term creation of value, and *managers* are pushed to comply with their desiderata in order to preserve or enhance their status, the interests of the *stakeholders* are increasingly stressed by the value codes adopted by firms, by an increasing number of independent directors, the spreading of environmental and ethical associations of consumers, the increasing social and environmental concern of local communities. This external control from stakeholders is efficient to the extent that the information on the structure, activities, and performance of the firms is complete and reliable. This allows the authorities to repress fraudulent or dangerous behaviors while the final users of goods and services may shift their demand towards the producers more concerned with ethical and environmental values.

5 New globalization and new environmental policies

The analysis developed so far has a few policy implications for enhancing the sustainability of development at the world level. First, global markets cannot be left unregulated, while their mere deregulation is unable to assure a satisfactory and sustainable performance of the world economy. Therefore the international community cannot do without institutions having the power and the resources to provide the minimum amount of active regulation necessary for developing competitive global markets and for assuring their smooth functioning. The process of new globalization requires in particular:

- An authority with the responsibility of regulating e-markets in collaboration with the other authorities. This is the most urgent priority. This unregulated medium offers new opportunities to economic crime that must be promptly thwarted. In particular the worldwide web offers

plenty of new and more efficient occasions for evading or eluding the existing national regulations.

- An anti-trust authority aimed to repress monopolistic practices at the world level. A firm not dominant but influential in many local markets could be definitely dominant at the world level. In addition there are monopolist and oligopolist practices that cannot be detected and thwarted by local authorities.
- An authority able to cope with the instability of financial markets. Also in this case the existing local authorities have been greatly weakened by the new globalization because their powers are local while the genesis and transmission of instability has more and more an international nature (for a recent restatement of this argument see Eatwell-Taylor, 1999).
- An environmental authority meant to enhance the sustainability of the world development.

The list is not exhaustive but must be kept as short as possible. In addition the international authorities, which have to be established in order to provide the minimal required regulation to global markets, have to be, as far as possible, light non-bureaucratic organizations. In addition they must be transparent and accountable democratic organizations assuring the active participation of all countries, including the poorest developing countries.[24] Moreover the international community should establish minimal requirements for local regulations in order to avoid the effects of what could be called 'Gresham law of regulation' according to which, as in the case of currencies, the bad regulation drives away the good regulation. The new globalization is strengthening very much this phenomenon as is suggested by the very rapid recent development of 'fiscal paradises' and offshore centers and by the downgrading of environmental, sanitary, and ethical standards often enforced in recent years by a few international trade agreements (particularly after the establishment of WTO). A gradual upgrading of the minimal regulations has to be introduced by the international community in order to stop and begin to reverse this process. International agreements on a well-calibrated package of incentives to good regulation and disincentives to deviations from it may be useful to start the process.

We have argued so far that to solve the worldwide problems, including the environmental ones, correlated with the new globalization we need a minimal amount of regulation of global markets. What sort of regulation? I will try to sketch a summary answer only for the environmental problems that are the direct concern of this paper. In the past environmental regulation has relied almost exclusively on the legal system and C&C (Command and Control) instruments. C&C

interventions are necessary whenever the problem faced may involve catastrophic and\or strongly irreversible effects and the action to curb the behaviors responsible for these effects must be taken immediately. The prohibition of production and use of DDT and CFC gases has been quite effective in repressing their use and so in slowing down the accumulation of substances having strongly irreversible catastrophic effects. However, the shortcomings of these methods are by now well known. To actually enforce the required regulations of global markets the necessary controls must be efficient; however this is very difficult particularly at the world level. In addition, in order to enforce the sanctions inflicted to curb deviating behavior, the legal system must be efficient which in most countries is not generally true. In any case the enforcement of controls and sanctions is more likely to be efficient if the prohibitions are kept to a minimum so that environmental and legal authorities may concentrate their attention and resources to enforce them.

In all the other cases the environmental policy should rather rely on economic and knowledge-based instruments. As for financial and economic instruments, green taxation may play a role to internalize negative environmental externalities but its shortcomings are becoming increasingly evident. In most countries 'green taxation' schemes are very difficult to design in an equitable way and even more difficult to enforce effectively; in addition they are usually very unpopular so that their implementation brings about not only elusive behaviors but also widespread hostility towards any kind of environmental concern and policy intervention. Much more promising is the systematic introduction, also at the world level, of marketable permits schemes. In this case the intervention of environmental authorities may be kept to a safe minimum and is basically concentrated in the initial phase (establishment of the global amounts of permits, initial distribution, and the setting up of the market for their regular trading). As the number and the scope of these schemes increases, the initial costs and requirements are bound to diminish; in particular the establishment of a world market where many permits of this kind may be traded would encourage the launch of new schemes of this kind. The project of an international scheme of permits to cope with the Kyoto objectives is very welcome as it would contribute to close the gap between the current trend of environmental indicators and that planned in Kyoto, so that, once an international market is set, it would greatly encourage the diffusion of these schemes. Finally, mixed economic instruments, such as deposit-refund schemes, are emerging as powerful instruments of environmental policy as they introduce in the markets effective incentives to environment-friendly behavior without an excessive bureaucratic burden for the public authorities that manage them. In particular, innovative schemes of environmental bonds could be devised in order to prevent and

[24] These requisites are so important that, until they are not sufficiently satisfied, it is better to regulate the international markets through the active coordination of the existing local authorities

control environmental risks, especially those connected with the introduction of innovations that might have irreversible negative effects in the long period, as often is the case in the field of biotechnologies.[25]

In addition, in the knowledge-based economy progressively established by the new globalization the focus of policy intervention should be shifted mainly in the new direction of knowledge-based instruments. The environmental objectives are in the interest of people whether they act as entrepreneurs or consumers or savers, provided that their time horizon is not too short.[26] The main objective of environmental authorities should therefore mainly consist in clarifying this point and its implications to everyone and helping them to change their behavior in order to reach objectives that are in their self-interest. In particular this may be obtained by means of voluntary agreements with firms in which they commit themselves to improve the environmental quality of their products and productive processes in exchange of advice, know-how, technical expertise and further benefits (e.g. a particular eco-label that certifies the specific environmental concern of the firm) from the environmental authorities.

In addition, in the context of new globalization that in principle may greatly enhance the actual sovereignty of consumers, the most efficient incentives to environmentally sound products

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that are more likely to have a minimum degree of transparency and accountability.

[25] The case for the systematic introduction of environmental bonds for controlling environmental risks has been first argued by Perrings (1989), while a critical assessment of the literature may be found in Torsello-Vercelli (1998). The basic idea here suggested is that the would-be innovator in certain well-defined areas characterized by high environmental risks which cannot be easily assessed ex-ante (such as in biotechnology), may be authorized to introduce a new good, say a new transgenic vegetable, only after having paid a sizeable environmental bond which may be recovered (with interests) to the extent that, after a congruous number of years, the feared risks did not materialize. This would slow down the pace of innovation in certain environmental sensitive areas without stopping it altogether, selecting the less dangerous innovations and stimulating further research before the implementation of innovations, while the funds so accumulated by the environmental authorities managing the scheme could be used for compensating eventual damages, fostering environmental research and realising environmental projects.

[26] In the case of firms this assertion is confirmed by a growing number of studies using different methods of analysis (statistical, econometric, historical, and so on). The results obtained show that the firms that survived longer in the last century and that obtained higher average growth rates and long-run returns are the firms most sensitive to the interests of all the stakeholders and therefore with a longer-run time horizon in their decision strategies. In particular a correlation has been detected between an active concern for the environment on the part of firms and their medium\long period profitability (for a recent study see: Butz-Plattner, 1999). Further interesting confirmations of the above assertions come from the comparison between the behaviour of the recently (8.9.99) launched *Dow Jones Sustainability Group Index* that synthesizes the stock-exchange performance of about 200 corporations of 22 countries particularly concerned with long-run sustainability constraints and the behaviour of the global Dow Jones Index; it has been shown in particular that the *Dow Jones Sustainability Group Index* systematically performed better than the global Dow Jones index in the period 1.1.'94-30.6.'99 (see Dow Jones, 1999, and fig.11).

and processes have to come from consumers themselves. To the extent that they are environmentally aware, they will choose the most eco-compatible products provided that sufficient information is available to discriminate between them. This is the role of environmental certification (such as ISO 14001, EMAS, and ecolabels) that allows the consumers to make the right choice. This is basically a transfer of information promoted by environmental authorities that can be made more efficient by utilizing the new opportunities offered by ICT technologies. Certification just proves that a certain aggregate standard has been reached, but the considerations and details underlying it could be made available to interested consumers or associations of consumers via Internet, greatly enhancing the impact of the certification process.

More in general, the field of 'knowledge-based' policy instruments is a very promising, though still almost completely unexplored, territory. A few recent experiments in this direction were very successful and opened new important strategies of intervention for promoting sustainability in both developing and developed countries. Three examples may be briefly mentioned. By gathering and disclosing information on the environmental performance of firms and by rating them, the *Proper* program introduced in Indonesia in 1995 succeeded in creating powerful incentives for pollution control ensuring a bargaining equilibrium between firms and stakeholders much more consistent with sustainability than before (see Vinod, et al., 2000). Similarly, by gathering and disclosing information on the environmental quality of beaches and rating them, the *Blue flag* campaign in Europe succeeded in soliciting the active participation of stakeholders and private sponsors in order to upgrade the environmental quality of beaches while inducing a healthy competition between local communities and authorities in order to obtain an excellent rating (ibidem). Finally, the obligation for Pension Funds, recently introduced in U.K. (since the 3d of July 2000), of disclosing systematically how social, environmental, and ethical considerations is already succeeding in pushing the investment managers and trustees of Pension Funds to address systematically environmental and social issues in their investment strategies (Nicholls, 2000, p.17).

The scope and viability of knowledge-based instruments has been recently jeopardized by a few international trade agreements that enforce the abrogation of national laws and previous international agreements that set environmental, sanitary, and humanitarian minimum standards that are interpreted as non-tariff barriers to trade. This is true in particular with some of the international agreements backed and enforced by WTO (see Wallach-Sforza, 1999), such as the SPS (Agreement on Sanitary and Phytosanitary Measures), TBT (Agreement on Technical Barriers to Trade), AGP (Agreement on Government Procurement), TRIP (Agreement on Trade Related Aspects of Intellectual Property). A case in point is the hostility of WTO against UE eco-labeling since the disclosure of information concerning the area of origin or productive modalities of products is

unduly interpreted as an unjustified discrimination between economic subjects. This approach is groundless and dangerous since it triggers a vicious circle of downwards competition that is bound to progressively deteriorate the environmental, medical, and humanitarian standards. This involutional process that would make globalization eventually unsustainable must be promptly stopped and reversed in the direction of the progressive upgrading of environmental, medical and humanitarian standards, encouraging the systematic adoption of knowledge-based instruments that greatly enhance the necessary process of upward competition. This is a crucial condition for the sustainability of globalization and development.

If the approach here advanced to environmental policy is correct, the systematic deregulation of international markets cannot be a substitute for their active regulation. In particular, in the environmental field an International Institution, that could be called International Environmental Protection Agency, should intervene in order to:

- Promote international agreements on a short list of global problems that need C&C measures, collaborating with local environmental authorities in order to enforce the prohibitions.
- Promote international agreements on the equitable exploitation of global commons (see Dasgupta, Maler, Vercelli, 1997).
- Promote international agreements between developed and underdeveloped countries, such as debt swaps, pollution offsets, transfer of technologies, and so on.
- Promote and harmonize green taxation measures whenever they are viable and productive.
- Establish and regulate international markets for environmental permits and derivatives.
- Promote the design and implementation of voluntary agreements between firms and public authorities.
- Promote environmental certification: minimal requirements of environmental safety of products and processes to be certified, and voluntary certification of environmental excellency (ISO 14000, EMAS, ecolabel, etc.)
- Promote the systematic design and implementation of ‘knowledge-based’ instruments inducing the active participation of stakeholders and local communities
- Promote environmental knowledge and education.

This proposal may appear utopian, as many countries are reluctant to take any step that would seem to involve the transfer of even a small portion of their sovereignty to a supranational agency. However, it is here stressed a logical necessity that of course must be realized avoiding any unnecessary transfer of sovereignty from local authorities to the supranational agency, and

guaranteeing at the same time transparency, accountability, and democratic participation of member states and stakeholders. In any case the main activity of an environmental agency of this kind should be focused on the gathering, elaboration, and transfer of information, knowledge, know-how, and technical expertise concerning the relationship between economic activity and sustainability in order to upgrade progressively the environmental standards of world development. In the knowledge-based economy spread around the world by the new globalization, these limitations may turn out to be less binding than it could seem at first sight.

6 A case study: the role of banks

Extensive research has ascertained that the enterprises that have survived longer and have obtained best results (including average long-run returns) are those that have been more sensitive to the interests of all the stakeholders.[27] Further research has clarified that stakeholders rank the quality of the environment among their top interests (see, e.g., Schmidheiny and Zorraquin, 1996). Therefore it is in the interest of any enterprise, including banks, to care for the environmental implications of their activity, provided that the time horizon of the strategic decisions of its managers and directors is not too short (see retro section 5 and note 26). In addition banks have good reasons to favor the client enterprises that are particularly concerned with the environment since, in a long-run perspective, lending money to them reduces risks and increases returns. A selection criterion of this kind triggers a virtuous circle that gives incentives to enterprises and banks to progressively upgrade their environmental standards. Therefore banks may play an important role for enhancing the sustainability of world development in the era of new globalization.[28] However, before considering why and how, we have to discuss a preliminary issue.

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[27] See e.g. the recent econometric study by Butz and Plattner (1999), the survey in Blumberg, Blum and Korsvold (1996) and the additional literature cited in Schmidheiny and Zorraquin (1996).

[28] This has been promptly recognized by UNEP (United Nations Environment Programme) that in 1992 launched a Financial Initiative aimed to strengthen the virtuous circle between the environmental concern of banks and enterprises. In particular banks have been invited to sign a *Statement by Banks on the Environment and Sustainable Development* (reported in the Appendix of Schmidheiny and Zorraquin, 1996) that commits them to 'regard sustainable development as a fundamental aspect of sound business management' and to improve the environmental standards of their activity. This Statement has been signed by more than 170 banks of more than 100 countries and has contributed very much to the greening of the financial sector. Most signatories improved their management rules in a more sustainable direction by including environmental risks in their risk assessment and risk management, often obtaining an environmental certification (ISO 14001) for sections or the whole of their activities, and publishing a periodical report on its environmental policy and on its implementation.

We have seen that the new economy *in principle* tends to reduce, and eventually to eliminate, the asymmetry of information potentially available to economic agents. Since, according to the prevailing view, the main reason for the existence of banks lies in the asymmetry of information characterizing financial transactions, it has been argued that the role of banks in the new economy is bound to fade away. Against this syllogism two basic objections may be raised, even if we assume that all the existing information be readily available to everyone through Internet.

First of all, the divide between the part of society that regularly utilizes Internet and the part that is unable to use it increases the asymmetry of information between these two categories of people. This new divide is currently widening the gap between the North and the South of the world[29] and requires prompt and vigorous policy actions to reverse this dangerous trend. However, we may at least hope that through growth of personal incomes, a better distribution of opportunities and wealth, and systematic diffusion of education, this gap between e-literates and e-illiterates may eventually be sizably narrowed.

However the second objection is more basic and reveals in which direction the banks may build their future. Even assuming that everyone is able to get all the information desired through internet, the same bits of information may have different meanings and implications according to their interpretation that depends on the complexity and sophistication of the cognitive structures and capabilities of the agents. In other words we should never confuse information and knowledge. Information becomes knowledge only when inserted in a cognitive structure within each of which it may assume different semantic and pragmatic implications (see Vercelli, 1999). If the cognitive structures are weak, the information received may be meaningless or acquire a simplistic and misleading meaning. Only a complex and deep cognitive background and sophisticated cognitive capabilities acquired through learning may translate information in useful knowledge. The distribution of knowledge, differently from that of information, cannot become homogeneous, not even in principle, because it is founded more and more in specialization. This suggests the idea that banks may survive, even prosper, within the new context shaped by the new globalization to the extent that they will prove able to transform the available information in useful knowledge able to inspire their own decisions as well as those of their clients. The business of banks will be less and less the simple intermediation between savers and investors in order to bridge the asymmetry of their information, but it will rather develop in the direction of systematic advice to the clients about their economic and financial choices by exploiting a superior specialized knowledge in many fields

[29] It has been observed that there are more Internet connexions in New York than in the entire Africa.

related to financial transactions. Playing this new role banks may give an important contribution to the sustainability of development.

In consequence of the process of new globalization the productive and distributive system is becoming more and more a knowledge-based economy in which knowledge is becoming the principal factor of production. This is a huge opportunity for sustainability because knowledge in itself does not pollute nor waste natural resources. The focus of banks on the transfer to clients of specialized knowledge naturally includes also the transfer of specialized knowledge about how to care for the environment because this is in the interest of banks and their clients. Banks may therefore prosper while contributing to enhance the sustainability of economic development.

We may consider now in more detail how banks may contribute to sustainability.

First of all, though banks do not particularly waste natural resources nor significantly pollute, they may further reduce both with sizeable benefits for their accounts. In particular, by following the best-practice rules in lighting and heating they may significantly reduce the energy consumption. In addition banks should aim to reduce the consumption of paper (by using only recycled paper; and by gradually implementing paperless offices) and to develop telework (see retro section 3). All these measures would reduce in a permanent way the general expenses improving the cost\income ratio that is very closely monitored by the analysts and is highly regarded by the market. These advances within the banks would also have an important ‘demonstration effect’ on client firms, while the know-how acquired in the eco-friendly organization of offices could be transferred to the client firms as a part of a house-bank relationship.

Of course the process of world development can be made sustainable only through huge investments a great part of which has to be financed by banks. Therefore banks have to evaluate the soundness of environmental projects and to select the best ones. More in general, whenever banks finance a firm have to evaluate the environmental risks involved in its activity and especially in the new investment to be financed. It is well known the case of Exxon-Valdez, the petrol tank that sunk near the Alaskan coast heavily polluting all the area; in consequence of this accident the Exxon, proprietor of the petrol tank, has been condemned to pay 900 billion dollars for many years as a compensation for the damages produced. More in general the global compensations already fixed by the courts of the USA for environmental responsibilities are greater than the entire turnover of the insurance sector of the USA (see Schmidheiny and Zorraquin, 1996). As a consequence, in the USA and in most other countries, insurance companies have recently withdrawn from the environmental sector making more difficult for firms to cover their environmental risks. Uninsured environmental risks may seriously jeopardize the ability of firms to repay their debt to banks, also because the collaterals are often buildings or lands whose value is extremely sensitive to

environmental factors. The environmental risks of firms are very serious also because in many countries (including those in North-America and Europe) the environmental responsibility is conceived as ‘objective’, since the polluter must pay the damages whether or not fraud or negligence has been ascertained. In addition in a few countries (including the USA) the banks that have financed polluting firms have been condemned by courts to participate in the indemnification of environmental damages on the basis of a principle of indirect responsibility. For all these reasons banks have to evaluate accurately the environmental risks of any project of investment before financing it and have to build and update a model of environmental scoring and to develop an accurate procedure of environmental risk-management. In order to do so they have to acquire within the bank specific competencies and know-how.

We may call the type of investment mentioned above as *defensive* because it is mainly meant to avoid losses for the investing firm. However the environmental concern also opens new interesting opportunities for *proactive* investment meant to start new businesses related to the environment. In particular the banks may develop an activity in *environmental finance* (trading in environmental securities and derivatives, and management of ethical or green funds). At the Board of Trade of Chicago there is a rapidly growing market of green securities (e.g. marketable permits for sulphur dioxide emissions according to the very successful programme introduced five years ago under the terms of the Clean Air act, or certifiable tradable offsets successfully launched by Costarica since 1996). An international market in tradable permits is expected to emerge soon under the recently revised terms of the 1997 Kyoto Protocol, which imposed binding targets on the GHG emissions of industrialized nations. Analogously the sector of ethical and green funds that has a much longer tradition is currently increasing very rapidly. In the USA, e.g., the number of ethical and environmental funds tripled in the last three years overcoming 1000 billion $ (more than one 10th of the total). The share of environmental and ethical funds is rapidly increasing in all the industrialized countries (U.K., France, Canada, Germany, Switzerland, etc.)

Another important role may be played by banks as third-party within schemes of voluntary agreements between environmental authorities and firms; the approval of the authority would guarantee the environmental soundness of the investment which could thus be financed at a lower rate of interest; in addition the specific competence of the bank may help to optimize the design and management of the agreement.

Finally banks that have high competencies in both ICT and environmental problems may promote the constitution of virtual communities of firms and\or people concerned with environmental problems offering a wide range of useful information, services and advice.

7 Concluding remarks

In this paper we have considered a few dangers and opportunities for sustainability associated to the process of new globalization that began to spread in the last years of the past millenium. The first source of dangers that has been emphasized arises from the structural weaknesses of global markets that determine a gap between their actual characteristics (radical uncertainty, strong incompleteness, sizeable transaction costs, extensive externalities, intrinsic instability, and so on) and the desirable characteristics of the textbook model of perfect-competition market. This gap may be reduced by the systematic application of ICT, but it cannot be fully eliminated by unregulated or fully deregulated markets. In addition the process of new globalization strengthened a pre-existing source of serious risks for the sustainability of world development as it encouraged further the short-termism of economic agents that goes hand in hand with the alleged weakening of the business ethics of economic operators and of the ethical awareness of the users of goods and services.

These problems are currently aggravated not only by the excesses of unjustified regulation of local markets but also by a deficit of direct regulation of global markets in their real, financial and virtual aspects, as well as by the process of their deregulation as designed and enforced by WTO in the recent years, to the extent that it weakens the ethical and environmental constraints and standards of international trade. Global markets require a more incisive and efficient regulation aimed to progressively upgrade the ethical and environmental standards in order to assure the environmental sustainability of economic development at the world level. The analysis developed in this paper suggests that the way out may be found in two directions that are mutually consistent. First, while unjustified regulation of local markets should continue to be relaxed, the deficit of regulation of global markets should be countered with much more energy through multilateral agreements and independent supranational agencies characterized by transparency, accountability, and active democratic participation of member countries and stakeholders. These agencies should be designed in such a way to minimize at the same time market and regulation failures limiting the interventions to the enforcement of a minimal set of rules capable of assuring acceptable worldwide standards; in the knowledge-based economy spread by the process of new globalization an important contribution in the direction of this very difficult task may come from the systematic gathering, elaboration, and diffusion of relevant knowledge.

This policy perspective has been somewhat clarified in this paper only in reference to environmental sustainability. A supranational agency for the protection of the environment could do

a lot for assuring sustainability within a common, and level, playing field (promoting and managing international agreements on a short list of global problems that require C&C instrument, on the equitable exploitation of global commons, on North-South swaps, on the harmonization of green taxation, setting up and regulating the new markets for environmental permits and derivatives and so on), for gathering and elaborating a wider and deeper knowledge on the health of the biosphere, and transferring the relevant information through market mechanisms (environmental certification, eco-labels, environmental reporting, etc.), through transfer of technology and know-how within the frame of voluntary agreements engaging the relevant economic subjects, through education of producers and final users of goods and services.

In any case the regulation *of markets* through public institutions, including the independent supranational agencies mentioned above, though necessary for assuring the smooth functioning of competitive markets and for drawing the best from them, is insufficient and should be complemented by regulation *through the markets* themselves. The more the markets approach the textbook model of perfect competition the more comes true that the ultimate power in directing the economic decisions depends on the preferences and values of the final users of goods and services (consumers, savers, investors). If they were unconcerned with the medium and long period, and in particular with the freedom and wealth of future generations, and they were unconcerned with the ethical consequences of their choices, any democratic form of regulation of markets would be insufficient to assure the sustainability of economic development. However in this paper we have argued that there are reasons to believe that this pessimistic analysis is incorrect. Though the concern for ethical values and long-term goals is still insufficient now as it was in the past, there are no solid reasons to believe that it has faded away nor weakened in the last years. What has been actually observed in the last decades is a radical change of the prevailing attitude on the most efficient means for pursuing ethical values and long-term goals.

Disillusionment with parties, trade unions and public institutions has led to a breakdown of confidence in them, while at the same time there was a formidable growth of voluntary service, humanitarian foundations and associations, NGOs, no-profit companies, etc. Even in the private sector we have detected in this paper a series of trends that tend to strengthen an active concern for ethical values and long-term goals. On the contrary, the persisting concern of people for ethical values and long-term goals opens the door for a systematic development of regulation of the markets *through the markets*. The concerned final users of goods and services should be encouraged to exert their sovereignty in the right direction by choosing eco-friendly goods and services, by putting them in the position of knowing the ethical and environmental implications of goods, services, and productive processes (through reporting, certification, eco-labeling, etc). This is likely

to produce a virtuous circle between the active concern of the producer for improving the environmental quality of their products, services, and processes thoroughly publicized through certification, disclosure and ecolabeling in order to capture the growing demand of concerned customers and the active concern of customers stimulated by the publicized concern of the producer. This promising perspective may be successfully pursued only if the international agreements and institutions aiming at deregulating international trade understand that the environmental standards, like other ethical standards, are not to be interpreted as unjustified non-tariff barriers to trade but as necessary conditions for the sustainability of globalization. This calls for an urgent revision of these agreements and a radical reform of institutions such as WTO that risk to direct the deregulation of international market in an unsustainable perspective.

Finally, there are promising trends in the evolution of corporate governance rules that may give more weight to a longer-term horizon. Relevant authorities (e.g., SEC in the USA, CONSOB, in Italy, etc.), environmental institutions (such as UNEP, EPA in the U.S.A, ANPA in Italy, etc.), NGOs (such as Greenpeace, WWF, etc.), scholars, specialized magazines, and pressure groups are urging with some success all the existing corporations to adopt:

- Codes of behavior that assure a longer term time horizon and ethically sound behavior.
- More transparency and accountability on balance sheets, budgets, quality of processes and products including environmental quality.
- More concern for all the stakeholders (not only the stockholders) that are in principle very concerned with the quality of products and processes and the long-term sustainability of the firm and of the local areas where it operates.
- More reliance in corporate boards on independent directors who are in the position of being less influenced by short-term partial interests.

These trends have to be thoroughly strengthened in order to implement more sustained and sustainable development at the local and global levels.

In the financial field these virtuous circles are particularly important in order to defuse the mechanism that is currently greatly reinforcing short-termism. The more the investment of the stock of saving intermediated by financial institutions is constrained by savers, through explicit or implicit contracts, in directions consistent with sustainability, the less space will be left for short-termism and destabilizing speculation. The green funds, and more in general ethical funds, are a good example of this approach. Their success in the last years suggests that in this field a virtuous circle may be triggered and sustained between the active concern of savers and the active concern of

financial institutions. We must try hard to reinforce this and similar virtuous circles in order to contribute to sustainability. Banks in particular may give an important contribution to sustainable development within the framework established by the new globalization. In consequence of the process of new globalization the productive and distributive system is becoming more and more a knowledge-based economy in which knowledge is becoming the principal factor of production. This is a huge opportunity for sustainability because knowledge in itself does not pollute nor waste natural resources. The progressive shift of the focus of banks on the transfer to clients of specialized knowledge involves also the transfer of specialized knowledge about how to care for the environment because this is in the interest of both banks and their clients. Banks may therefore prosper while contributing to enhance the sustainability of economic development.

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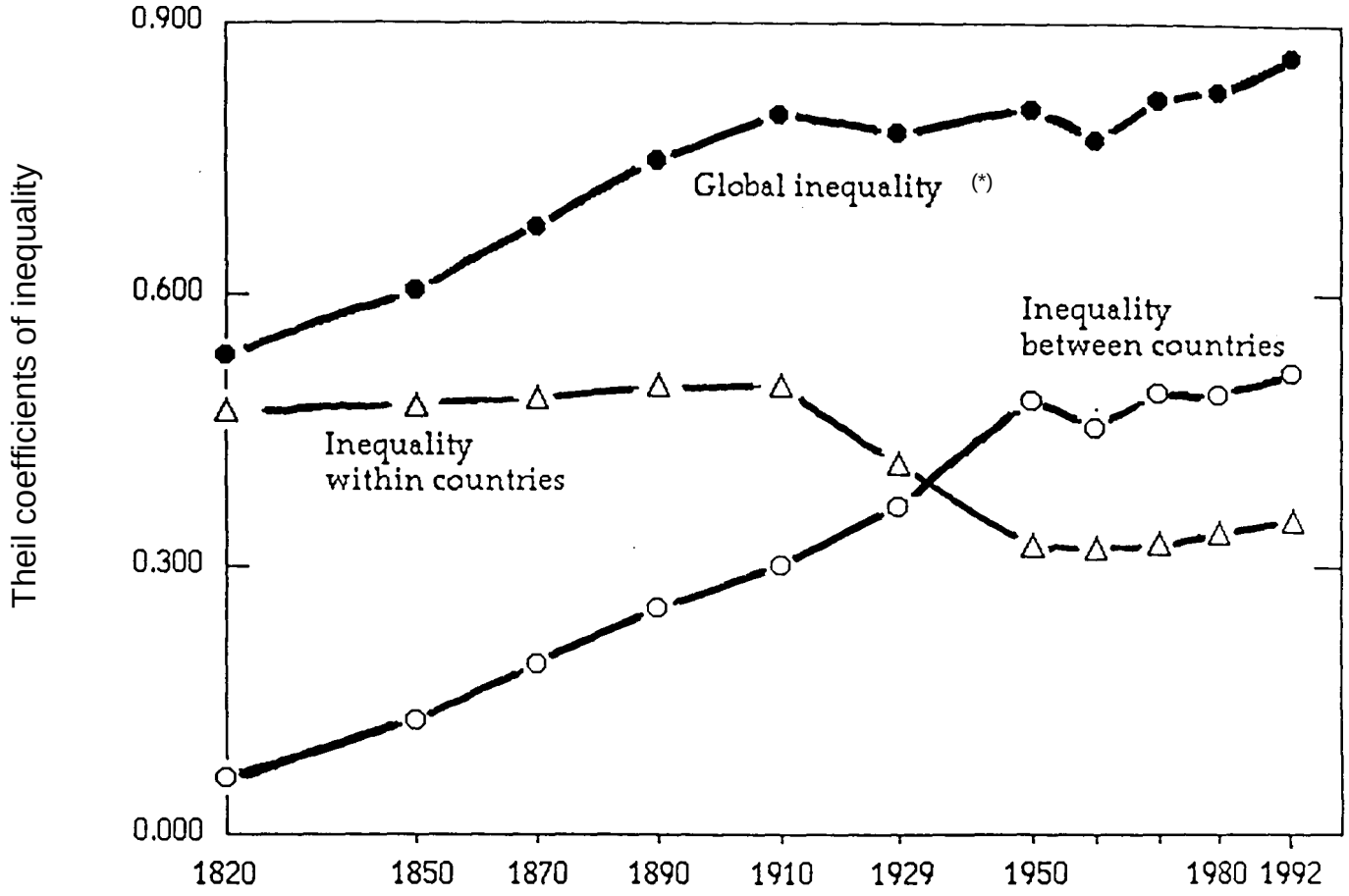
Fig. 1 - Global Inequality of Individual Incomes 1820 - 1992



(*) Gobal inequality is the sum of the other two curves. Gini 1992 index = 0.667

Source: Bourguignon and Morrisson(1999). The "countries" here consist of 15 single countries with abundant data and large populations plus 18 other country groups. The 18 groups were aggregates of geographical neighbours having similar levels of GDP per capita, as estimated by Maddison (1995).

Fig. 2 - Trade-Policy Orientation and Growth Rates in the Third World,1963-1992

	Average annual rates growth of GDP per capita		
Trade policy orientation	1963-1973	1973-1985	1980-1992
Strongly open to trade	6.9%	5.9%	6.4%
Moderately open	4.9%	1.6%	2.3%
Moderately anti-trade	4.0%	1.7%	- 0.2%
Strongly anti-trade	1.6%	- 0.1%	- 0.4%

Sources and notes: World Bank (1987, pp. 78-94), with further growth data from World Bank 1994. In all periods the three strongly open economies were Hong Kong, South Korea, and Singapore. The identities of the strongly antitrade countries changed over time. In 1963-1973, it consisted of Argentina, Bangladesh, Burundi, Chile, Dominican Republic, Ethiopia, Ghana, India, Pakistan, Peru, Sri Lanka, Sudan, Tanzania, Turkey, Uruguay, and Zambia. For the two overlapping later periods the strongly anti-trade group consisted of the previous sixteen plus Bolivia, Madagascar, and Nigeria, but minus Chile, Pakistan, Sri Lanka, Turkey, and Uruguay. For the identities of the moderate-policy groups, see the World Bank (1987, pp. 78-94).

Fig.3 - Potential Impact of E-materialization (by 2008)

	Energy Saved	GHG Saved (metric tons)
Paper	0.16 Quads	20 million
Construction	0.3 Quads	40 million
Total	0.46 Quads	60 million

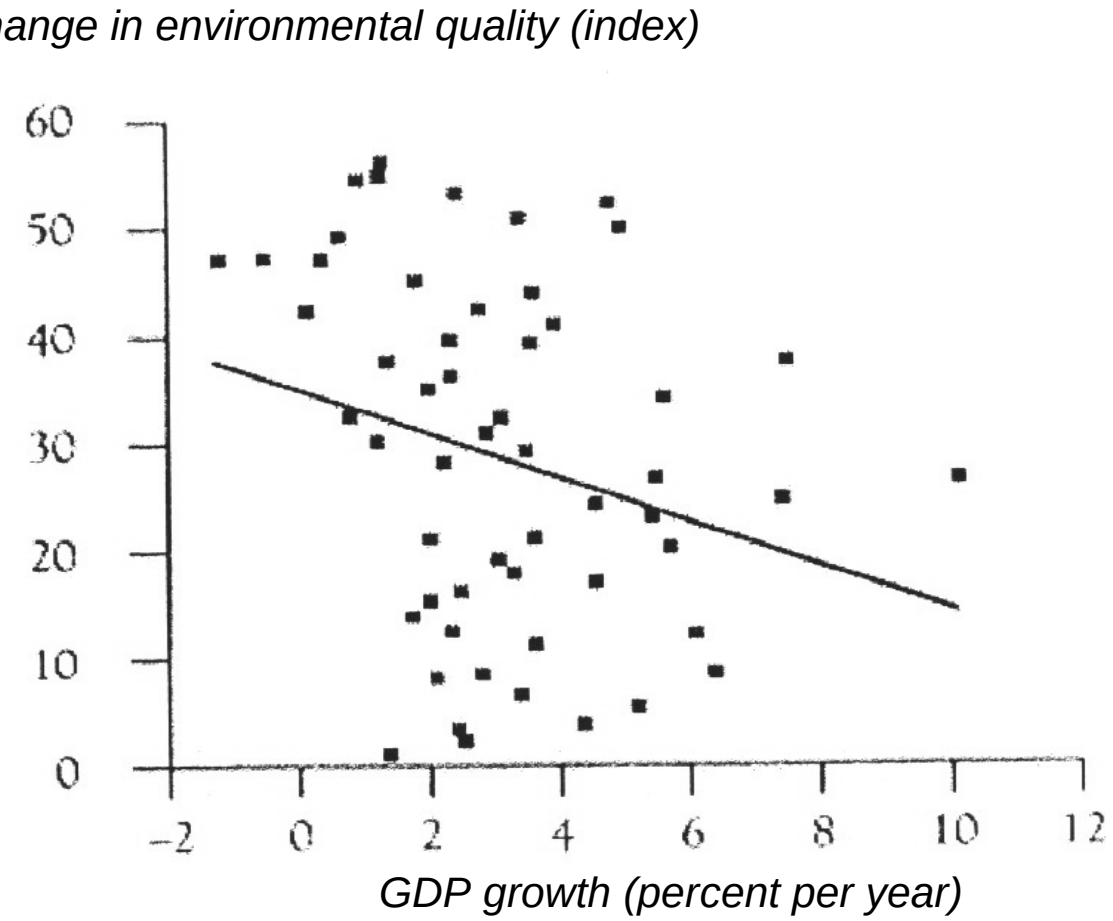
Source: ROMM, J., et al., 1999

Fig.4 - Potential Impact of Internet on Buildings (1997 to 2007+)

Building type	Sq.Ft. Saved	Electricity Saved (kWh)	Natural gas Saved (MBTU)	GHG Saved (metric tons)
Retail	1.5 Billion	18 Billion	67 Million	14 Million
Office	2 Billion+	35 Billion	-	21 Million
Warehouse	Up to 1 Billion	-	-	-
TOTAL	3 Billion+	53 Billion	67 Million	35 Million

Source: ROMM, J., et al., 1999

Fig.5 - Environmental Changes Versus Growth of Income. 1981-98



Note: r = -0.27, p < 0.05, n = 56. The data are for 56 developments countries. Controlling for per capita income in 1981 gives a similar pattern and the same value for the correlation coefficient (-0.27).

Source: World Bank (2000).

Fig. 6 - Rate of growth and environmental deterioration

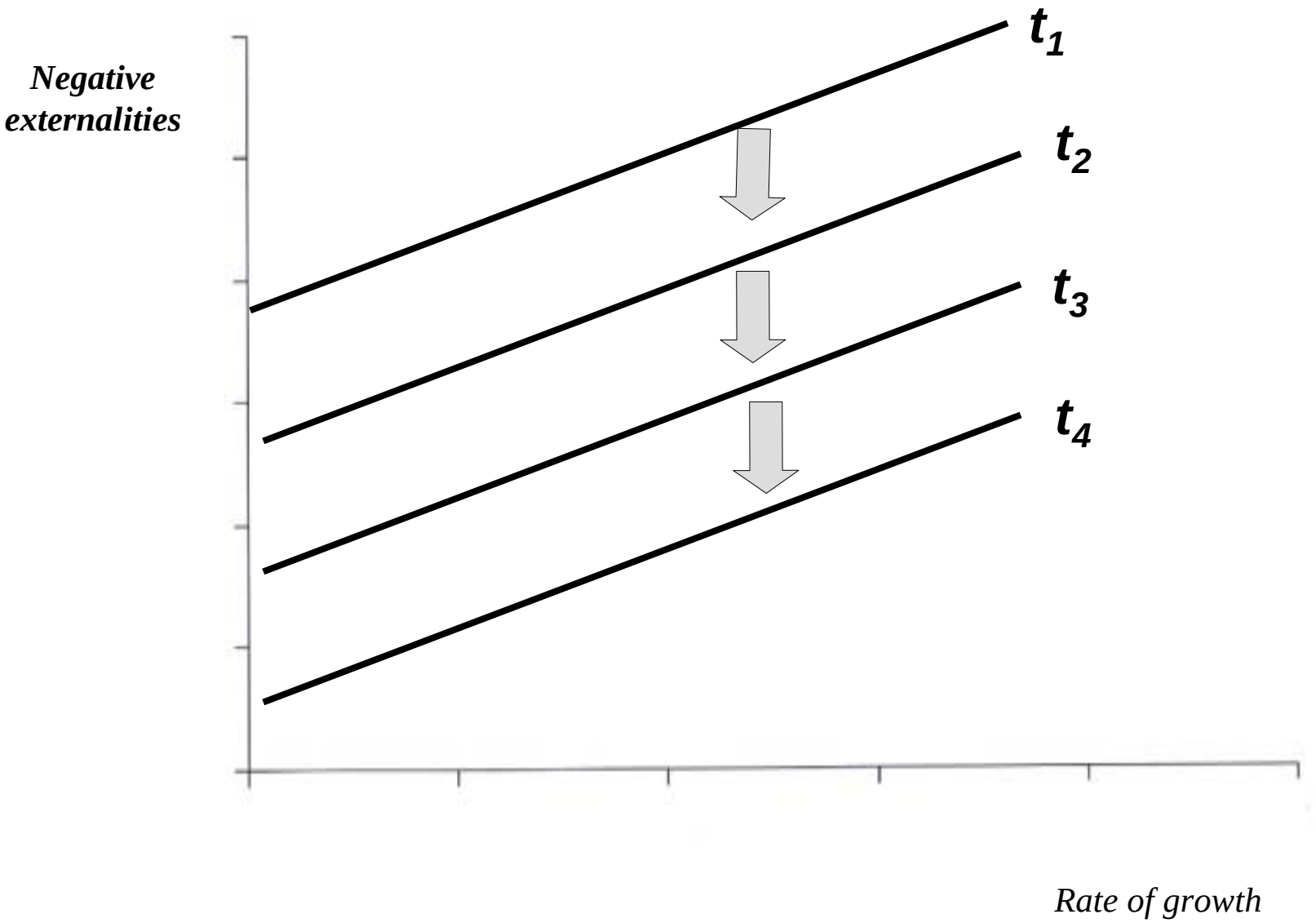


Fig. 7 - Stage of growth and environmental deterioration

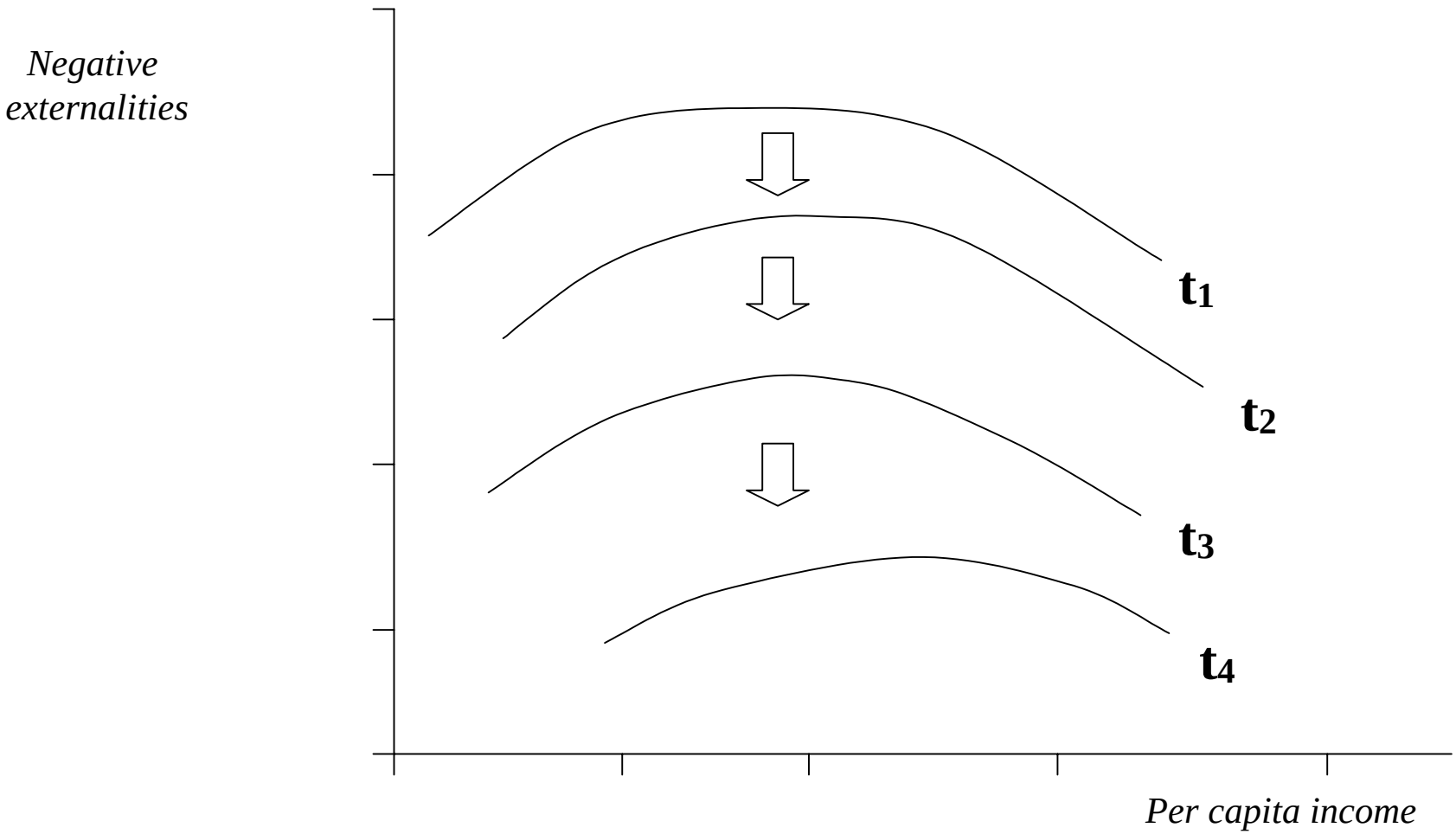


Fig. 8 - Growth and sustainability

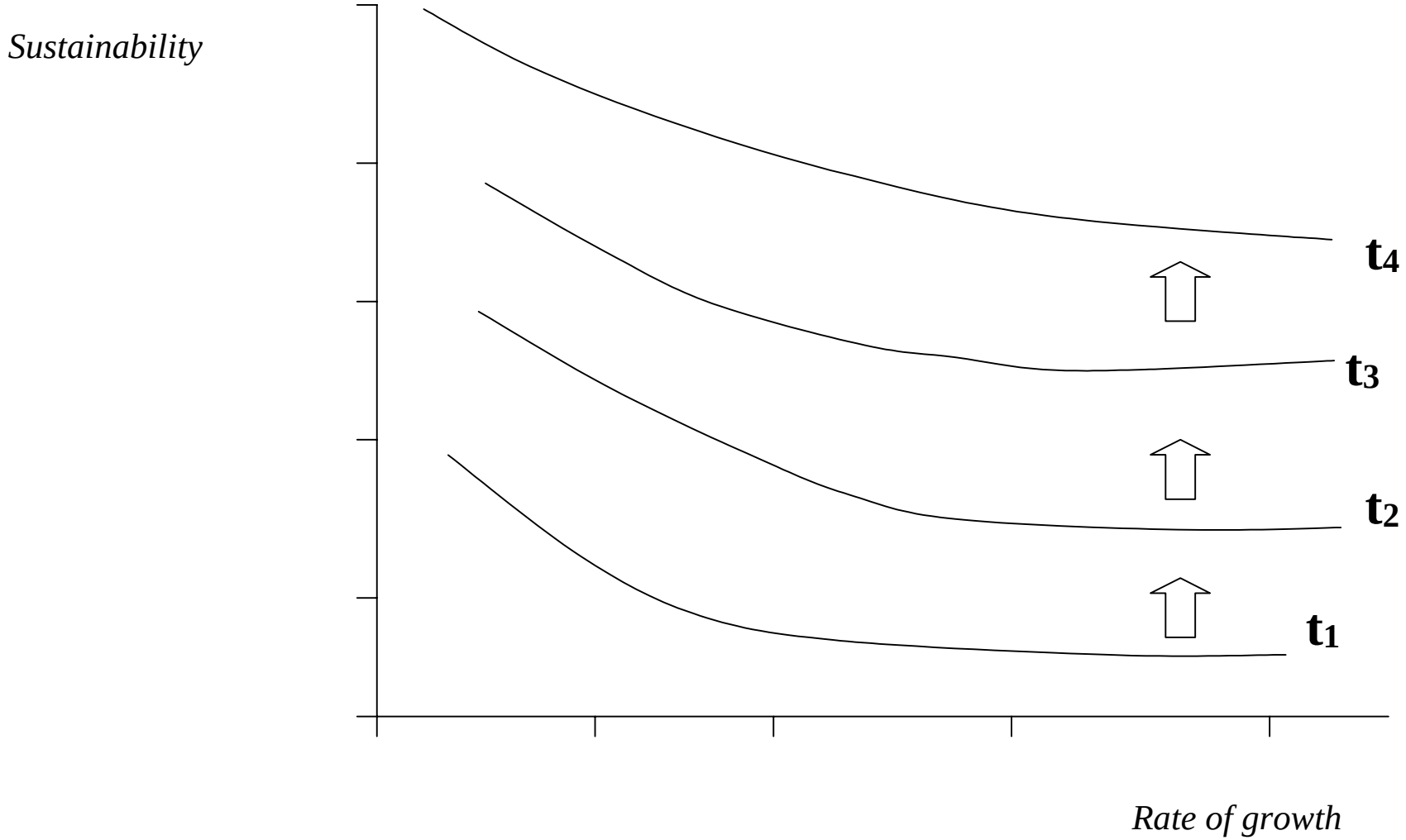
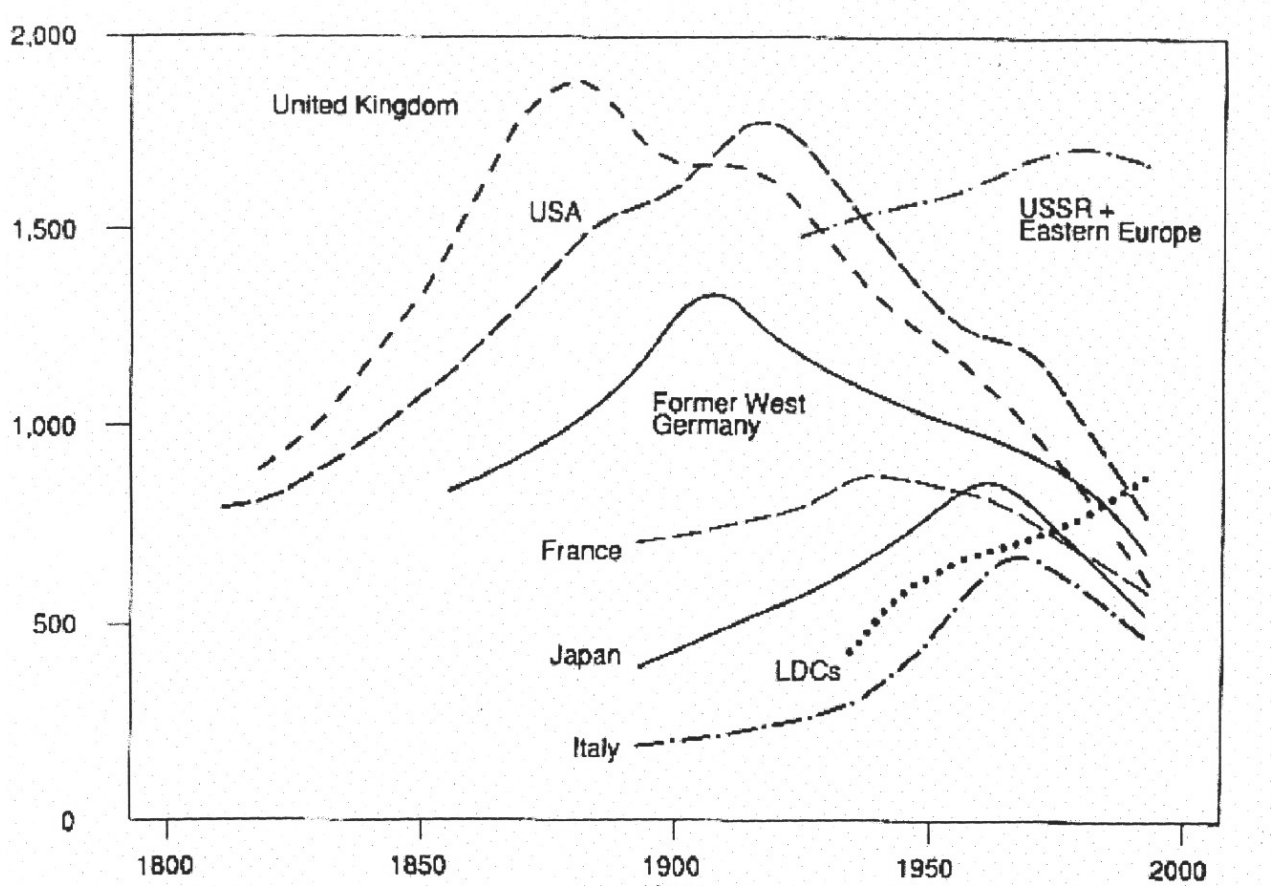


Fig. 9 - Historical trends in energy intensity (E/GNP ratio) in some countries and group of countries (kg Oe/$1,000 in 1975)

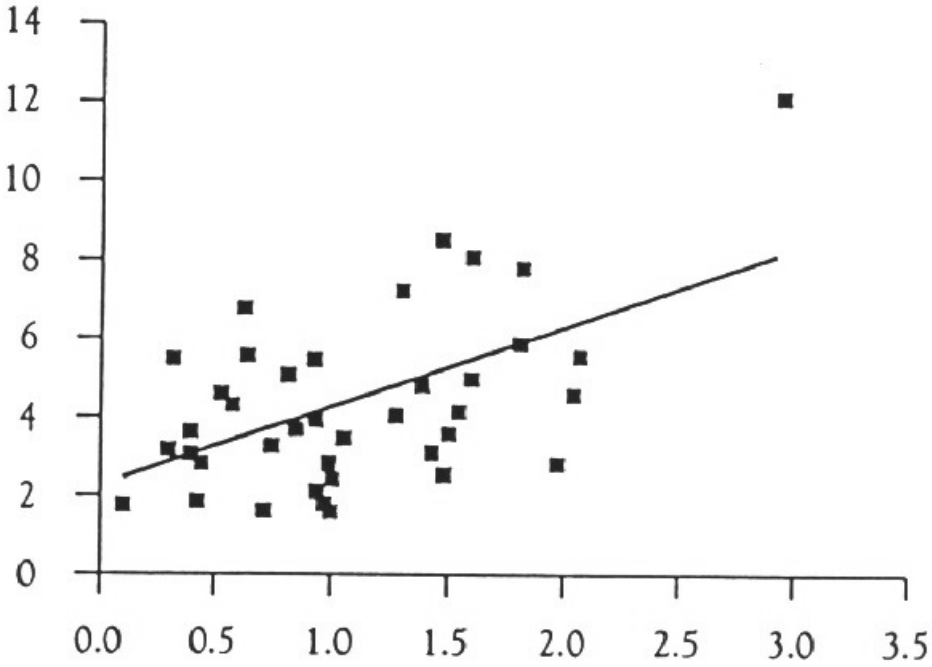
Energy intensity (E/GNP ratio)
(Kg. 0e/$1,000 in 1975)



Source: Colombo V., 1992

Fig 10 - Relationship between Economic Growth Variability and Volatility in Private Foreign Capital Flows, 1975-96

Volatility in annual GDP growth rates

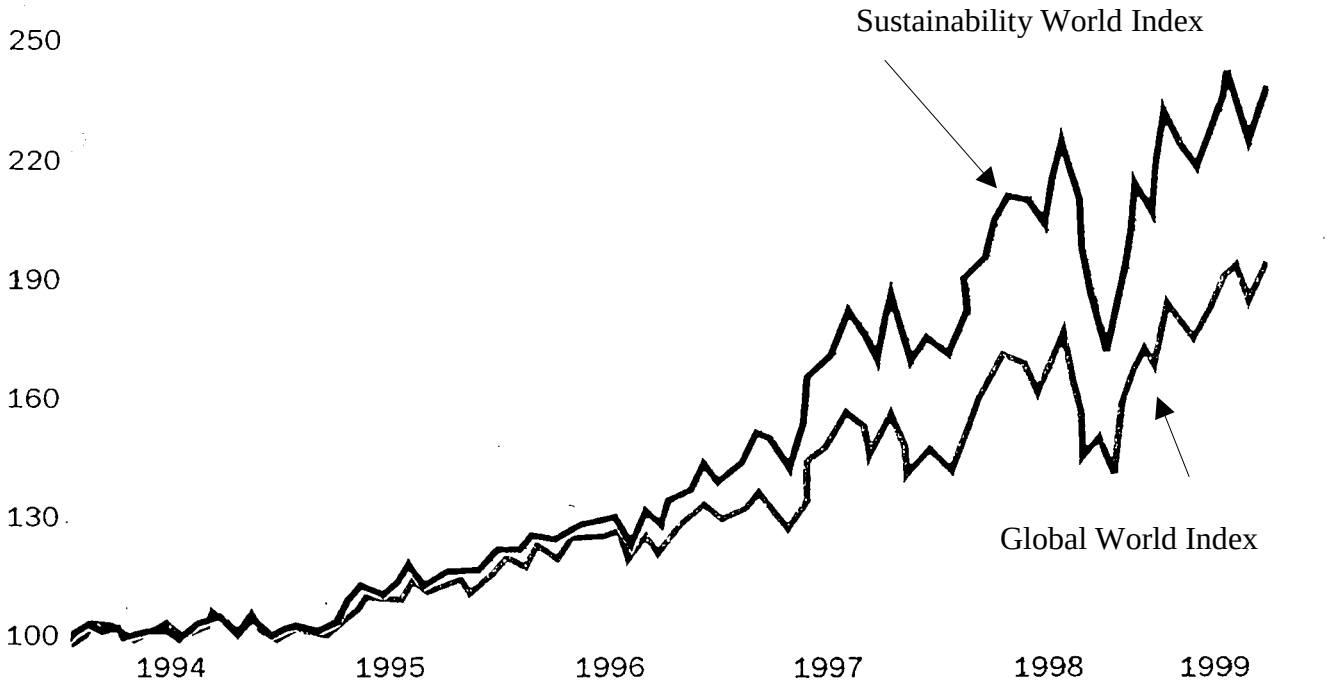


Volatility in annual capital flows

Note: y=2.02x + 2.15, r = 0.57
Source: Vinod, T., et al., 2000.

Fig. 11 – Backcasting of Historical Performances

Price-Indexes, USD Components as of April 1, 1999, backcasted.
Dow Jones Indexes - Period: 1.1.94 - 30.6.99



Source: Dow Jones, Report, 3/99, p. 2