

# Art and Technology: A Comparative Study of Policy Legitimation

NACHOEM M. WIJNBERG

*Department of Business Administration, Erasmus University, Rotterdam and Department of European Studies, University of Amsterdam, The Netherlands*

**Abstract.** The legitimation of technology policy is discussed from the point of view of the neoclassical and of the dynamic, Schumpeterian, approach. The results are presented, using the traditional categories of policy legitimation in welfare theory: public goods, externalities, and merit goods. Art policy legitimation is discussed within the same conceptual framework. The application of the dynamic approach to art policy leads to conclusions similar to the general conclusions about technology policy. A review of the postwar development of (Dutch) art policy supports the impression that art policy may be on its way to become a subspecies of technology policy.

**Key words:** technology policy, art policy, neoclassical theory, Schumpeterian approach

## 1. Introduction

At first glance, technology policy and art policy seem to have little in common. This seems to be especially the case with respect to problems of “legitimation”. It is commonly thought that money spent on art is difficult to justify on strict economic grounds. Some people conclude therefore that the arts should not be supported at all while other people simply deny that there is any need for “narrow” economic legitimation because art is a self-evident good thing which all good people should support. On the other hand, technological change has been shown to be a major explanation of productivity growth. Public policies to promote technological change are therefore generally thought to be more easily defensible on economic grounds.

Most economic analyses of technology policy or art policy are based on neoclassical economic theory. However, especially in industrial economics, neoclassical theory has come to be replaced, or at least to be supplemented by, a new theoretical approach. This new approach has been called “dynamic”, “Schumpeterian”, or “evolutionary”. Neoclassical theory and dynamic theory agree that public intervention can only be legitimate in case of market failure. A defense of governmental intervention in the arts must entail a demonstration of market failure in the arts market. However, the two approaches differ with respect to the question of what exactly constitutes a properly functioning market. According to neoclassical theory, a “perfect” market is a market which is in a state of pareto-optimal equilibrium. Necessary conditions to achieve this state include that no agent on the market has

market power (all agents must be price takers) and that all agents dispose of perfect information. The defenders of the dynamic approach consider these conditions to be so unrealistic that a model using them as assumptions is fundamentally flawed.

According to dynamic theory, a perfectly functioning market is a market in a state of continuous disequilibrium, allowing a maximum amount of innovation and change. Because the two approaches demand different things of a functioning market, they also result in different conclusions with respect to the legitimacy of specific public interventions.

The main subject of this paper is the legitimation of public support of the arts. The discussion of technology policy serves two aims. First, to compare the economic arguments that have been proposed to justify support of technological innovation on the one hand and support of the arts on the other. Secondly, to consider whether the latest developments in technology policy are, or should be, mirrored by developments in art policy.

This paper will attempt to present the arguments in favor of technology policy, first from a neoclassical point of view and then in the context of the dynamic approach. Following this, the arguments in favor of art policy will be discussed. Finally, conclusions will be reached about the relation between art policy and technology policy. I will treat both technology policy and art policy mainly in a national context. Issues having to do with international trade would complicate the discussion without changing the main argument.

## 2. Technology Policy

The importance of technology to economic success has been increasingly recognized, at the level of the economy, of the industry, and of the individual firm.

Solow's (1957) seminal article and many later contributions in the same vein have shown how only a small part of productivity growth could be attributed to increasing capital intensity. The rest, the so-called "residual", has to be attributed to other causes among which "technological change" figures predominantly. Even earlier, Schumpeter emphasized the importance of innovation in explaining the growth of firms and industries. The microeconomic and the macroeconomic roles of technology were most clearly linked in the work of those writers who explained long-term macro developments in terms of clusters of Schumpeterian innovations in time (Mensch, 1979; Freeman *et al.*, 1982; Kleinknecht, 1986) and in particular "leading" industries (Rostow, 1960, 1978; van Duijn, 1983).

The attention given to the role of technology led to two seemingly contradictory responses. On the one hand, if technological change was so important, governments should consider it their task to actively promote innovation. Recent decades have seen all developed countries, and most of the less developed countries, explicitly adopting technology policies and explosively increasing the money spent. On the other hand, if innovation was such a good idea for enterprises, would not the market

process ensure a optimal allocation of means to innovative ventures, and would not public intervention lead to inefficiency?

The answer to these questions is, again, that the government should intervene whenever the market process does not function properly, when there is market failure. Also, ideally the market should be the final arbiter of what constitutes good innovation and not the public authorities. However, as has already been noted, there is much disagreement among economists about what constitutes market failure and how common it is. Also, a not inconsiderable part of innovative activity does not come in contact with any real market. This is the case with research which cannot be directly transformed into marketable products, so-called basic science, and also with the many innovations which are performed in the "sheltered culture" (Derain, 1990), connected with public procurement for the military, space exploration, public medicine etc.

Arrow (1961) defined invention as the production of new information. The market for new information operates imperfectly because of three characteristics of the good in question: inappropriability, uncertainty, and indivisibility. The low costs of information transfer make it difficult, without public intervention, to exclude others from profiting from it. The production of new information is an intrinsically unpredictable and risky business; not only because of the nature of the product but also because of the impossibility of effectively monitoring the research effort of (potential) competitors. Moreover, information is very unevenly distributed between those who produce and those who finance. This, together with the problem of appropriability, can cause agency problems and market failure. New information, once produced, is indivisible and can be applied without extra costs to small or large production processes. Therefore, there exist evident scale advantages which can also cause market failure.

Market failure such as that described by Arrow leads to suboptimal allocation and especially underinvestment in invention and innovation. Although there is a place for the public goods argument, the externalities argument dominates his analysis. The prescribed reaction of public authorities in the case of externalities is to correct relative prices by taxes, subsidies, or other means, such as providing complementary goods at artificially low price levels.

Arrow's analysis serves to legitimate both direct subsidies for inventive or innovative behaviour and the patent system which helps to make new information appropriable, and, thereby, raises its price. Much research within the neoclassical equilibrium framework has been directed to the study of the efficacy of the current patent system and of possible alternatives (e.g. Mansfield *et al.*, 1977; Scherer, 1984; von Ungern-Sternberg, 1984).

Other writers, following the lead of von Hayek and Schumpeter, have contested the validity of some of the crucial assumptions of neoclassical modelling. They reject equilibrium analysis and propose that competition could better be described as a dynamic process in a state of continuous disequilibrium. More specifically, they attack Arrow's analysis on four interrelated points: 1) deviation from the

state of perfect competition, in which all agents are price takers, is the rule, not the exception; 2) both entrepreneurs/managers and public authorities have severely limited capacities to collect and evaluate information; they live in a state of “bounded rationality” in Simon’s sense; 3) information transfer is costly (Mowery and Rosenberg, 1990); 4) information transfer costs and the efficacy with which the patent system rewards innovators are highly variable across industries (Mansfield, 1985; Levin, 1988).

The last argument implies that even if Arrow’s analysis was correct in all other respects, public intervention to promote innovation, and especially the patent system, would have to have different characteristics in different industries to remedy market failure. This seems extremely impractical, if not impossible, even without taking into consideration the fact that the appropriability conditions of specific industries also change over time.

Attempts have been made to counter the first argument by proposing that if the ideal situation of perfect competition is not attainable, public authorities can nevertheless help bring about a second-best optimum by taking the market distortions for granted and correcting relative prices. However, to do this effectively, public authorities must know the ratios of marginal costs and marginal rates of substitution of all goods and the external effects of production and consumption of any good on any other good. One does not have to invoke the concept of bounded rationality here to conclude that this assumption seems even more unrealistic than the assumption of perfect competition.

The next step could be to invoke the possibility of the existence of a third best optimum, reached by making a “reasonable probabilistic judgment” (Ng, 1979) about the second best world. “Third best theory suggests that policy-makers examine the information and decide whether, in the light of it, there are reasonable grounds for amending the first best rule appropriately if there is fairly precise information about the way in which an external (dis)economy generated in producing good X operates via the substitutes and complements for X in creating further distortions – even though all the economy-wide ramifications are not known.” (Hall, 1986). In reality, this means nothing more than making informed guesses about external effects.

Although the critical arguments against neoclassical policy analysis seem quite convincing, and although new models of dynamic competition and the innovation process have been constructed (e.g. Nelson and Winter, 1982), these models have not yet been able to provide a completely new foundation for technology policy. Nevertheless, the “dynamic” critique has fundamentally reinterpreted the neoclassical arguments. Most importantly, market failure is considered to occur whenever there seem to be impediments to the dynamic process of Schumpeterian competition. The “perennial gale of creative destruction” as Schumpeter described it, must be allowed to run its course, unhampered by anticompetitive actions of enterprises or short-sighted public authorities.

To safeguard the market process in this sense, the center of gravity of technology policy has increasingly shifted in the direction of the removal of barriers to innovation and barriers to entry. Barriers to entry are so important because it has become clear that, on the one hand, a disproportionate amount of innovative activity is performed by new firms and on the other hand, old firms are driven to innovate by the threat of (new) competition (Scherer, 1980; Wijnberg, 1990). Competition policy and innovation policy have grown closer to each other. Public authorities do not attempt to bring the situation closer to an equilibrium optimum but to create conditions which allow as much room as possible for the process of innovative competition to bring forth new solutions.

The recommendations resulting from the dynamic approach can still be described using the normal terminology of welfare theory.

The public authorities should consider basic science, the results of which cannot be an object of patent protection, to be a public good. Education and "pure" research are considered in most countries to be a responsibility of the government. Fundamental research by private firms should also be supported on basis of the public good argument, especially if the research is directed to an area where the nation hopes to create a competitive advantage in the future.

Innovative activities, other than basic science, can constitute a source of positive externalities. A part of these externalities can be internalized with the help of the patent system. However, patents generally allow only limited appropriation of public benefits, especially in industries where technological change is exceptionally rapid. However, strengthening patent protection effectively in those industries, for instance by broadening the scope of a patent, could easily result in slowing down the pace of innovation in the long run.

Therefore, governments may consider it necessary to subsidize innovation in particular industries. However, the process of dynamic competition should not be hampered by public intervention. Support for innovation, on the basis of the externalities argument, can only be justified in the context of an analysis of the effects on barriers to entry.

The merit good argument should be used sparingly and not so much to justify subsidizing innovation as to justify subsidizing the dissemination of information about innovation, innovations, and science, especially to smaller firms. This, again, would have the effect of lowering barriers to entry (and innovation).

Thus, technology policy should consist of public support for basic science and the scientific infrastructure; support for innovative activities with evidently high positive externalities, but only in so far as raising this support is not likely to endanger the process of dynamic competition by having a negative effect on the barriers to entry and, finally, other types of public intervention explicitly aimed at lowering barriers to entry, especially through disseminating information.

### 3. Art Policy

Few economists have yet seriously attempted to explain part of the “residual”, the productivity growth left unexplained by changes in capital intensity, as the effect of the arts or of artistic change.

Nevertheless, art in the workplace is credited with raising creativity and productivity (Martorella, 1990). Certainly, the correlation between national artistic and economic success is far from perfect. However, this may be caused by the fact that the *national* appropriability of art is even smaller than the *national* appropriability of pure science.

Before discussing why governments should or should not support the arts, it would be nice to answer the question of what art is. Unfortunately, there is no generally accepted definition of art.

For the purpose of an economic analysis of art policy, it seems best simply to call art everything which is recognizable as art to at least one of the parties in a transaction, something which fulfills at least some of the functions at least one of the parties thinks art is for.

Again, if there were perfectly functioning markets for all species of art, governmental intervention would be unnecessary. Therefore, writers arguing in favor of public intervention in the art market have to show that market failure occurs. Grampp (1989) attempted to present a survey of all arguments in favor of public intervention. Some of these arguments are variants of others or have only a few supporters and are merely presented to be instantly demolished by Grampp’s neo-classical rigor. The remaining arguments have to do with the well-known trio of public goods, externalities, and merit goods. Most other writers on the subject (e.g. Abbing, 1989; Fullerton, 1991) also present their arguments in the framework of these three categories.

The public good argument has many variants. One simply says that art, old art which has to be safeguarded and new art which is being produced, is something which enhances the quality of life for all humankind. Art may also be a reason for national or even species pride. Art may also be a way of ordering our experience (Gombrich, 1982) and thereby increasing our knowledge and understanding. In this way, art might be described as the most basic of the sciences and the same (public good) arguments for support of basic science might be invoked in support of art policy, both with respect to education and to “research”.

Grampp criticizes the public good argument on the grounds that even accepting that art has the properties of a public good, one cannot say how much support art deserves in comparison with the many other public goods, such as medical services for the poor and elderly, clean forests and beaches, or national security. He seems to argue that public policies are only justified if the taxpayers are convinced that they get exact worth for their money in such a way that all marginal rates of transformation and substitution are equal. He seems to forget that because problems of choice concerning public goods cannot be effectively solved in the marketplace,

and because it is clearly impossible to organize a referendum about every case of support for a putative public good, people have governments to which they have delegated the task of making decisions about the claims of different public goods on the public purse. As Abbing (1989) also argues, if one disagrees with the choices the government makes, one can emigrate, or vote against the government, or influence the political process by any other means. Precisely because public goods are public goods they must be dealt with by the political process, not the market process.

The externalities argument also has many variants. The weakest is to point to the huge spin-offs in spending by art customers (Myerscough, 1988; Radich, 1987), the additional consumption and resulting employment generated as side-effects of art consumption; e.g. consumption and employment at hotels and restaurants in the neighbourhood of a museum or a theater. In the best case, these are only pecuniary externalities, shifting the distribution of wealth from one city or region to another, and not increasing the total. Real positive externalities may arise from the fact that consumption of an artwork by an individual decreases the price of consumption by others or decreases the production costs of other goods. The most extreme case of positive externalities would occur if consumption of one person gave another person a chance to consume for free. It is sometimes difficult to consume a work of art without letting at least some others benefit by imitating, reproducing, or just walking along and gazing from a distance. Just as a perfect patent system would serve to help internalize the positive externalities of innovation, so would an ideal copyright law serve to internalize this kind of externality. However, real copyright law has many shortcomings, especially with respect to new forms of art (Kabel, 1991). Nevertheless, this in itself is not a convincing argument for direct subsidies because of presumed externalities. If important externalities of this type exist, it always seems to be possible to internalize them, for instance, by building a wall around the work of art and selling tickets. If the externalities are not important enough to make people pay, if given the choice, the government has no reason to do it in their place, except if the externalities are sufficiently general to bring the public goods argument into play.

Lastly, Fullerton (1991) has presented the argument that there are people who derive a beneficial effect from having other people consuming art (having your cake and seeing others eat it) and that taxing these people to raise the money to support the arts would be proper use of the externalities argument. But how to identify these people? And if one assumes that the argument holds for the whole community, one has again returned to the public good argument.

The merit good argument essentially says that most people do not realize the full extent of the benefits art consumption confers on them. The argument is often linked with the proposition that art consumption has the characteristics of an addiction; one needs to acquire a "taste" for it, and the more one has consumed, the more one wants to consume (Scitovsky, 1972). The government, therefore, considers it as its task to promote this type of beneficial addiction. Most people do not accept that

public authorities should interfere in personal things such as their “taste” in so far as it does not harm other individuals or society. Especially with respect to such a presumably highly personal area as one’s taste in art, writers are scornful towards paternalistic merit goods arguments (Fullerton, 1991; Peacock, 1991).

If the assumptions of traditional neoclassical analysis were true for the art markets, only the public goods argument would have any chance of serving as legitimation for support of the arts.

However, the main points of the dynamic critique of neoclassical analysis are also valid with regard to the art market.

The characteristics of art markets are not in accordance with the assumptions necessary to achieve the neoclassical ideal of pareto-optimal static equilibrium. “Production technology” as well as consumer preferences, are in constant flux. Innovation can be a crucial success factor, at least in the contemporary arts. Market power is unevenly distributed among buyers and sellers, and among players on each side of the market. Furthermore, artists, art consumers and public authorities are not the supremely rational decision makers of neoclassical fiction. Their ability to collect and evaluate information is limited. Public authorities cannot really find out how much its constituencies are willing to pay for art and most individuals have a very limited knowledge about the art products that are on offer. Also, information transfer about the arts is costly and, as argued already, the appropriation of positive external effects via intellectual property law is limited. For of these reasons it seems appropriate to apply the dynamic approach to the art market and to policy legitimation.

Market failure occurs if the process of dynamic competition is hampered, if there are obstacles in the way of the gale of creative destruction caused by the continual occurrence of cycles of innovation and imitation. If there exist sufficient opportunities to innovate and if innovators have no disproportionate problems in entering the market, the market will function optimally.

The public good argument remains essentially unchanged in the dynamic approach. In so far as conservation of art works or general education about art can be considered public goods, the government has a case to legitimize support for these activities. This is also the case with respect to the “art as basic science” argument. However, just as the legitimation of support of basic science decreases the closer the scientists approach the end of the innovative process, so should support for art as a public good concentrate on those activities for which (as yet) no viable market exists.

Most of the versions of the externalities argument that were already dismissed in the context of neoclassical analysis fare no better when approached from a dynamic angle. The argument for direct subsidies because of the imperfections of copyright law was dismissed with regard to art in general. However, the most “innovative” works of art may generate much more benefit in the long term than can be internalized by copyright. This may partly be the case because these most innovative works of art are not immediately marketable, or are not marketable



at their “true” worth. The market may need more time to collect and evaluate information about them. Especially the most innovative works of art may inspire others to produce other works of art or other goods (Abbing, 1989) long after the copyright has lapsed. This brings the externalities argument again very close to the public good argument that art is a type of basic science. Peacock (1991) urges caution with respect to direct subsidies because the subsidies usually are awarded by people who have applied for them earlier or who will apply later, or by officials who “for understandable reasons wish to develop congenial relations with a few established clients.” In both cases the risk exists that public support only reaches a select group of “incumbent” artists or art institutions. He argues that “... the consumer interest may be better served in the long run by reducing the costs of new and innovative concerns in the art business.” (p. 13). Combining this with the points made above, one is led to the conclusion that if there is any substance to support for the arts because of the externalities argument, this should be reserved to truly innovative artists and institutions.

One could possibly present an extended version of the merit good argument with respect to innovative art. The government should not attempt to prescribe to consumers what they should like, but consumers can only choose between products when they have some knowledge about them. Therefore they may underrate the value consumption of new art could have for them because of an absolute lack of information. They may not even know how to inform themselves. Advertising, the obvious way to inform consumers of new “normal” products, is not a really viable solution for individual innovative artists. Therefore, the government can consider it its task to reduce the cost of acquiring this information by subsidizing education about the latest developments or shows of new artists, or at least subsidizing informing the public on how to acquire information. Of course, this version of the argument is only valid with respect to art that is so new or so exceptionally innovative that the usual channels of information (reviews in papers etc.) do not function properly.

#### **4. Another Road to the Same Conclusion: Technology Policy for the Arts?**

There seems to be no reason to exclude the art industries from the reach of the industrial, competition and technology policies directed at “normal” industries. The economic importance of the art industries, *not counting external effects*, is much greater than most people think. The estimated value of the yearly production of paintings in Holland in the 17th century was more than 2/3 the value of the cheese production (van der Woude, 1991). The economic importance of the contemporary art industries has been demonstrated in reports such as Hietbrink *et al.* (1985) and Myerscough (1988). If technology policy towards “normal” industries is legitimized, why not towards the art industries? The dynamic approach has served as a legitimation for the following types of innovation policy: public support for basic science and the scientific infrastructure, support for innovative

activities with evidently high positive externalities if this does not lead to higher barriers to entry, and other measures to lower barriers to entry. As noted before, art is unlike technology with regard to the particular nature of the putative external effects. However, there seems to be no reason to change the general argument.

Applied to the art industries, this would mean: support for art education and conservation, support for highly innovative art which may not yet be fully marketable and from which high positive externalities are expected to derive, and general measures to lower barriers to entry to the art industries, especially by facilitating information diffusion.

These recommendations are equivalent to the conclusions reached at the end of the last section. Thus, it seems that a specific art policy is unnecessary. Technology policy, intelligently applied to the art industries would suffice.

Moreover, this would fit in well with the development art policy has gone through in the last several decades. Oosterbaan Martinius (1990) has described the changes in Dutch art policy since 1945. He distinguishes three phases. In the first phase the government (sparingly) supported art because its beauty would “elevate the minds of the people.” The conservation of art and traditional “high” art received most of the support. In the second phase, support for the arts grew explosively and the principal aim of art policy shifted from educating people and elevating their minds towards providing for their well-being and, also, that of the artists. As many people as possible should participate actively and passively in art production. All professional artists should have a secure income. The third phase brought a reappraisal of the value of the market process. The government should not force art upon unwilling citizens, nor should it be forced to support all artists. The catchword of the third phase became “quality”. Support for education and conservation remained fundamentally unchanged. But only art of exceptional quality, highly innovative art, was deemed worthy of full public support. Other art should earn its place in society by demonstrating that it had a viable market. Only then would the government consider partial subsidization.

The development Oosterbaan Martinius describes is clearly in the direction of the transformation of art policy into a subspecies of technology policy, to be legitimized on exactly the same grounds.

## References

- Abbing, H.R. (1980) ‘On the Rationale of Public Support to the Arts: Externalities in the Arts Revisited’, in W.S. Hendon (ed.) *Economic Policy for the Arts*. Cambridge Mass., pp. 34–42.
- Abbing H.R. (1989) *Een Economie van de Kunsten*. Groningen: Historische Uitgeverij Groningen.
- Arrow, K. (1961) ‘Economic Welfare and the Allocation of Resources to Innovation’, in R.R. Nelson (ed.) *The Rate and Direction of Inventive Activity*. Princeton: Princeton University Press, pp. 619–622.
- Derain, J.C. (1990) *America’s Struggle for Leadership in Technology*. Paris: Albin Michel.
- Duijn, J.J. van (1983) *The Long Wave in Economic Life*. London: George Allen & Unwin.
- Freeman, C., J. Clark, and L. Soete (1982) *Unemployment and Technical Innovation*. London: Francis Pinter.

- Fullerton, D. (1991) 'On Justification for Public Support of the Arts', *Journal of Cultural Economics* **15**, 67–82.
- Gombrich, E.H. (1982) *The Story of Art*. Oxford: Phaidon Press.
- Grapp, W.D. (1989) *Pricing the Priceless*. New York: Basic Books.
- Hall, P.H. (1986) 'The Theory and Practice of Innovation Policy: An Overview', in P.H. Hall (ed.) *Technology, Innovation and Public Policy*. Oxford: Phillip Allan, pp. 1–34.
- Hietbrink, S., F. van Puffelen, and J.A.M. Wesseling (1985) *De Economische Betekenis van de Professionele Kunsten in Amsterdam*. Amsterdam: Stichting voor Economisch Onderzoek.
- Kabel, J.J.C. (1991) 'Beeldende Kunst en Auteursrecht', in *Kunst en Beleid in Nederland*, vol. 5. Amsterdam: Boekmanstichting/Van Genneep, pp. 67–124.
- Kleinknecht, A. (1986) *Innovation Patterns in Crisis and Prosperity*. London: MacMillan.
- Levin, R.C. (1988) 'Appropriability, R&D spending and technological performance', *American Economic Review* **78**, 424–428.
- Mansfield, E. (1985) 'How Rapidly does New Industrial Technology Leak Out?', *Journal of Industrial Economics* **34**, 217–223.
- Mansfield, E., J. Rapoport, A. Romeo, E. Villani, S. Wagner, and F. Husic (1977) *The Production and Application of New Industrial Technology*. New York: Norton.
- Martorella, R. (1990) *Corporate Art*. New Brunswick: Rutgers University Press.
- Mowery D.C. and N. Rosenberg (1990) *Technology and the Pursuit of Economic Growth*. Cambridge: Cambridge University Press.
- Myerscough, J. (1988) *The Economic Importance of the Arts in Britain*. London: Policy Studies Institute.
- Nelson, R.R. and S.G. Winter (1982) *An Evolutionary Theory of Economic Change*. Cambridge Mass.: Harvard University Press.
- Ng, Y.-K. (1979) *Welfare Economics*. London: MacMillan.
- Oosterbaan Martinius, W. (1990) *Schoonheid, Welzijn, Kwaliteit: Kunstbeleid en Verantwoording na 1945*. Den Haag: Gary Schwartz/SDU.
- Peacock, A. (1991) 'Economics, Cultural Values and Cultural Policies', *Journal of Cultural Economics* **15**, 1–18.
- Radich, A.J. (ed.) (1987) *The Economic Impact of the Arts*. Washington D.C.: National Conference of State Legislatures.
- Rostow, W.W. (1960) *The Stages of Economic Growth*. New York.
- Rostow, W.W. (1978) *The World Economy*. Methuen: London.
- Scherer, F.M. (1980) *Industrial Market Structure and Economic Performance*. Chicago: Rand McNally.
- Scherer, F.M. (1984) *Innovation and Growth*. Cambridge Mass.: MIT Press.
- Scitovsky, T. (1972) 'What's Wrong with the Arts is What's Wrong with Society', *American Economic Review* **62**, 67–82.
- Solow, R.M. (1957) 'Technical Change and the Aggregate Production Function', *Review of Economics and Statistics* **39**, 312–320.
- Ungern-Sternberg, Th. von (1984) 'Innovator Protection and the Rate of Technical Progress', *Journal of Economic Behaviour and Organization* **5**, 115–129.
- Wijnberg, N.M. (1990) *Innovation, Competition and Small Enterprises*. Alblasterdam: Haveka.
- Woude, A.M. van der (1991) 'De Schilderijproductie in Holland tijdens de Republiek', in J.C. Dagevos, P.H. van Druenen, P.Th. van der Laar and P.R.A. Oeij (eds.) *Kunstzaken*. Kampen: Kok Agora, pp. 18–51.