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**The Economics of Friendship
among Scientists***
(La Economía de la Amistad entre los Científicos)

*Prof. Dr. Dr. h.c. mult. Horst Albach***

Universidad de Alcalá de Henares



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The Economics of Friendship among Scientists *

(La Economía de la Amistad entre los Científicos)

*Prof. Dr. Dr. h.c. mult. Horst Albach ***

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Abstract:

Albach takes as his point of departure the three myths around which today's research policy revolves: competition among scientists, the ambit of incentives and even the impact of an incentive to link teaching to research. He indicates that if the expectations of scientific production are taken into account, this orientation within research is completely mistaken. This is due to the fact that there has been a shift in the behaviour patterns of scientists from a satisfactory one to a pattern of behaviour which is purely opportunistic; something that is severely aggravated in the Bologna approach where competition between individuals is to be found within the same university. In classical Scientific Life, scientists did not compete; it was left to the universities to compete, resulting in universities enjoying a greater or a lesser degree of prestige. In order to be able to achieve the proposed scientific development, friendship is one of the most important factors in scientific production. Albach also examines the dynamic functions of scientific production and also, and especially, the function of a scientist's usefulness with regard to Nicomedes' Aristotelian ethics. This is a brilliant initial contribution in the revision of the present approaches to scientific development and the behaviour of scientists towards one another.

Arranca Albach de los tres mitos en los que se está centrando la actual política investigadora que corresponden a la competencia entre los científicos, al ámbito de los incentivos e incluso al impacto de un incentivo para vincular enseñanza e investigación. Señala que esta orientación de la investigación es totalmente errónea si se consideran las expectativas de producción científica. Ello es debido a que se pasa de un comportamiento en las relaciones entre científicos satisfactorio a un comportamiento de puro oportunismo, lo cual se agrava enormemente con el planteamiento de Bolonia cuando esta competencia entre personas se hace dentro de la misma universidad. En la vida clásica de la Ciencia los científicos no entraban en competencia, sino las universidades, señalando universidades de alto nivel y de menos nivel. La amistad constituye uno de los factores de producción más importantes al objeto de poder lograr el desarrollo científico planteado. Plantea las funciones dinámicas de producción y también, especialmente, la función de utilidad de un científico en torno a la ética aristotélica de Nicomedes. Es una brillante contribución inicial para una revisión de los planteamientos actuales del desarrollo científico y del comportamiento de los científicos entre sí.

Keywords / Palabras Clave: Science, Scientific Competition, Incentives, Friendship, Function of Scientific Production, Function of Scientific Usefulness / Ciencia, Competencia Científica, Función de Producción Científica, Función de Utilidad Científica.

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THE ECONOMICS OF FRIENDSHIP AMONG SCIENTISTS

1. Introductory Remarks

1.1. Competition among Scientists

Quite recently, Santiago García Echevarría has made a wonderful contribution to a volume edited by the German Academic Exchange Service on the topic: "How do foreigners experience Germany?" Santiago made friendship with Germans the subject of his contribution. This contribution may have been inspired by the slogan of the World Championship in Soccer "*Zu Gast bei Freunden*", but it has really been an expression of love with his German friends and the German people. This paper has been the inspiration for my contribution to this seminar.

One of the myths in the economics of education is that competition among scientists improves scientific output. Another myth, closely related to the first one, is that monetary incentives are strong drivers of scientific output. A third myth is that high monetary incentives like severance payments are needed to induce a scientist to exit the market for teaching and research.

Some people might object to calling the positive relationship between scientific output and competition a "myth". They consider every scientist to be in the race for the Nobel prize and try to find appropriate incentives for scientists playing in the minor league to reach the major league and then, eventually, the race for the Nobel Prize.

Others might say that it is cooperation in large research institutes that brings about products that are competitive in the race for the Nobel Prize.

We obviously have to define carefully what kind of competition we mean when we test for the hypothesis that competition has a

positive effect on scientific output. Traditionally, there was no competition for research funding between colleagues in a university. But there was certainly competition for reputation between different universities. Heidelberg and Göttingen are classical examples.

Today, the Bologna process has introduced competition among colleagues of one and the same university as an allegedly effective driver of scientific output. We have already become witness to changes in the behaviour of colleagues: from peaceful behaviour to opportunistic behaviour with adverse effects on scientific output.

1.2. Cooperation among Scientists

German scientists experienced the effects of antagonism between colleagues in the students' riots of the late sixties. Some professors sided with the students, others defended the freedom to teach. During those times, nobody could be sure that his colleague would not turn out his enemy. This resulted in a very unproductive faculty environment. Only those faculties with professors who said "Right or wrong: my colleague and friend" remained productive.

Today, we celebrate Professor Santiago García Echevarría on the occasion of his retiring from active university service. My friendship with Santiago dates back to his time of studies at Cologne University when Professor Gutenberg inspired both of us to build on the foundations he had laid. We wanted to develop a dynamic theory of the firm with investment in the firm's assets as one pillar (Horst Albach) and human resources as the other (Santiago García Echevarría). We benefited very much from each other's work. Our studies in the transformation processes of Spanish firms after Spain had become a member of the European Community proved to be helpful in the analysis of transformation processes of firms in the former German Democratic Republic two decades later. Our comparative research in social responsibility and corporate governance has certainly improved our understanding of the role of firms in society and of the

relationship between the respective systems of corporate governance and international competitiveness of firms.

In this paper, therefore, I want to make the point that friendship is an incentive much stronger than competition in the production of scientific output. In the first part, I will look at friendship as a factor in the dynamic production function of scientific output. In the second part, I will incorporate friendship in the utility function of the agent that produces scientific output.

2. Friendship in the Production Function of the Agent

In this first part, I will start with human capital theory. Then I will take a look at complementarities through friendship, and finally, a dynamic production function with friendship as a factor of production will be introduced.

2.1. Human Capital Theory

In classical economics, the production function of the firm is described as a functional relationship between the factor output and two factor inputs: labor and capital. For a long time, discussions of the validity of such an approach centered on the issue whether land could be assumed to have the same quality everywhere or whether it was mandatory to distinguish different types of land as input factors.

It was not until Gary Becker asked the analogous question with respect to the input of labor that it became customary to distinguish between unskilled and skilled labor. It takes investment in apprenticeship to produce skilled labor. In order to prevent skilled labor to move from firms with vocational training to firms without vocational training but a higher market rate of wages, Becker insisted that vocational training was "product-specific" and not general, so that there were no external effects of vocational training. Since firms do not invest in firm-specific training alone but also in other skills like team work and organizational design, it has seemed appropriate to add to Becker's labor factors a separate production factor called

"human capital". It was shown empirically that investment in human capital as a production factor has a positive impact on output.

However, this development of production theory took place within the framework of static analysis. Since friendship is an element which may vary considerably in its intensity over time, static production functions do not seem appropriate to incorporate friendship as a production factor.

2.2. Complementarity Theory

Paul Milgrom has revitalized the notion of complementarity in and among firms. He defines complementarity as follows: "Several activities are mutually complementary if doing more of any one activity increases (or at least does not decrease) the marginal profitability of each other activity in the group"¹. Milgrom assumes complementarity to be linear.

Complementarity takes many forms in the firm. For instance, one research project may positively influence another research project to the extent that raising research expenses on one project may positively influence the marginal profitability of the other research project. Or, raising the expenses for continued vocational training may raise the marginal profitability of expenses on personnel marketing.

Analogously, friendship among scientists might be understood as complementarity between the research activities of two (or more) scientists. The research results of one scientist motivate the other scientist to intensify his own research. This sounds like competition rather than cooperation. But it would be competition in the Japanese sense, not in the Western sense. It would be competition in perfect harmony, competition with the effect of strengthening each other. But complementarity in its strict sense means an increase in the value of the other's output and not

¹ Milgrom, Paul; Roberts, John: Economics, Organization, and Management, Englewood Cliffs, New Jersey 1992, p. 108.

necessarily an increase in his output.

Of course, this complementarity cannot be assumed to be linear. The more research output one agent produces, the less time remains for other scientists to read the research results of the other researcher. Therefore, the value of his research may gradually decline although the marginal value is still positive. The marginal value of friendship would decline with output. This does not seem to be an appropriate formulation of the productive effects of friendship.

Therefore, in the next section I will try to show that friendship is a factor of production in a dynamic formulation of the production function.

2.3. Dynamic Production Theory

Erich Gutenberg wanted to explain the coordination of factor inputs in what he called the „combination process“. In the combination process management combines the elementary factors of production, fixed assets, working capital, and labor with the objective to produce a marketable product. This, basically, is a static concept also. Erich Gutenberg could not at the time formulate a dynamic production function which explains an efficient trajectory over time when the volume of demand changes. Larry Epstein and Michael Denny developed such a production function in 1980². They considered raw material input as perfectly elastic and the inputs of capital and labor as quasi-fix production factors. It takes time to adjust a quasi-fix factor to a new optimal level. The lower the costs of adjustment, the faster the new optimal level of the quasi-fix factors is reached. In our extensions of the dynamic production function, we kept raw materials as a variable factor³ and added human capital and

² Epstein, Larry G.; Denny, Michael G.S.: Endogenous capital utilization in a short-run production model, theory and an empirical application, in: Journal of Econometrics 12 (1980), pp. 189 - 207.

³ Albach, Horst: Die Beschäftigungsentscheidung der Unternehmungen. Arbeitslosigkeit aus betriebswirtschaftlicher Sicht, in: Gahlen, Bernhard;

corporate governance as two additional quasi-fix factors of production in the dynamic production function⁴.

We now add a fifth quasi-fix production factor: friendship. We measure output of research results as a function of the quasi-fix factors **capital** (room size and library size and access), **labor** (number of research assistants), **corporate governance** (degree of independence from bureaucratic regulations; amount of freely disposable travel money), **human capital** (number of PhDs, MBAs and mathematicians in the research group), and **friendship** (intensity of communication; ordinal value of importance attached to close personal relationships). In order to measure friendship as an input factor, we first start with an aggregate measure of friendship. I suggest to use the number of individuals that have contributed to books honoring a scientist on various occasions as a measure for the input factor "friendship capital".

Secondly, the input measure of friendship is the individual relationship of the scientist with a particular individual, termed "friend". The empirical test of total annual output of publications by Horst Albach would certainly show that his friendship with Santiago Garcia is statistically significant and that its parameter is high. One conclusion from this result is that the honorary doctor's degree Horst Albach has been awarded by the Universidad de Alcalá is to a measurable degree due to his friendship with Santiago Garcia.

We would not test a production function with all the friends of a scientist entering as individual inputs separately because of the

Hesse, Helmut; Ramser, Hans Jürgen (Hrsg.): Arbeitslosigkeit und Möglichkeiten ihrer Überwindung, Tübingen 1996, pp. 83 - 129.

⁴ Kayser, Stefan: Die Dynamik der Unternehmenstransformation in Osteuropa. Eine theoretische und empirische Untersuchung des betrieblichen Transformationsprozesses, Wiesbaden 1999; Albach, Horst: Kreatives Organisationslernen, in: Albach, Horst; Dierkes, Meinolf; Antal, Ariane Berthoin, Vaillant, Kristina (Hrsg.): Organisationslernen – institutionelle und kulturelle Dimensionen, WZB-Jahrbuch 1998, Berlin 1998, pp. 55 - 77, esp. Section 3.2.

problem of multi-collinearity.

We sum up a first result of our analysis. The production-theoretic approach has proven that friendship is an important factor of scientific production. Friendship improves scientific productivity.

If we stopped at this point, the true value of friendship would not be captured. Friendship would be a factor of scientific production of an individual with the (sole) objective of climbing the ladder of performance ratings in the scientific community faster. Investing in friendship would be nothing but an expression of selfish interests⁵.

3. Friendship in the Utility Function of the Agent

3.1. Nikomachian Ethics and the Market

In modern micro-economic theory the assumption is made that economic agents maximize their personal utility and firms maximize their profits regardless of the consequences for other agents in society. Such behaviour is called "opportunistic". Asymmetries in the knowledge base of the agents can be exploited to one agent's benefit and to the damage of the other agent. The other agent tries to avoid the detrimental effects on him of such asymmetries by concluding contracts with the other agent that motivate him to disclose all appropriate information and knowledge. Thus, in a society of lone and selfish wolves contracts are essential for survival of the species. But since all contracts are incomplete, there always remains some risk.

The roots of this type of economic theory remain unclear. Here, I suggest that the theory of opportunistic behaviour goes back to a misunderstanding of the teachings of Adam Smith. He has been read to say that profit maximization by the firm is the proper

⁵ In a rather subtle paper George Akerlof argues that altruistic behaviour may result from the incentive to preserve power of the ruling class. See Akerlof, George A.: Loyalty Filters, in: The American Economic Review LXXIII (1983), pp. 34 - 63.

objective function. Selfish behaviour is economically rational and socially and morally justified. In my view this is an incorrect interpretation of Adam Smith. Being a moral philosopher he knew quite well the writings by Aristotle, in particular his *Nikomachian Ethics*. In proving that the invisible hand of the market takes care of the interests of the customers, he relieved the agents operating on those markets of the responsibility to care about the interests of the other agents specifically. Therefore, his objective function could contain one element only: his own profits. Since the firm knows that profit maximizing on a market with workable competition results in higher social welfare, the firm does not have to take the interests of other stakeholders into its objective function explicitly.

3.2. Ethics and Friendship

Friendship is a 2-Person relationship. Therefore, the Smith-assumption of workable competition does not apply. Therefore, we have to go back to the original Aristotle utility function of man.

Aristotle proposed that the mission of man in life is to achieve *eudaimonia*, a life of fulfillment. Life is fulfilled when man's activities have benefited himself and contributed to the "fellow-wellness" (Adam Smith) of others. In particular, the others are close friends.

Therefore, *eudaimonia* is reached when the personal benefits and the well-being of friends is maximized. Thus, the Aristotle utility function of a scientist contains two elements: Research results of the scientist's own endeavours and research success of his friend(s). In my model of the economics of friendship these two elements have weights adding up to 1. Self-interest in its strict sense may have the same weight as a friend's happiness, but in general it may lie between one half and less than one. Whatever the weights: this utility function excludes opportunistic behaviour. In fact: solving the model with an Aristotle utility function may result in lower benefits from one's own research and higher benefits from the satisfaction of having contributed to the

success of the friend's research success. In any case, total personal utility is higher than profits. .

4. Concluding Remarks

Friendship as a relationship between two persons cannot be interpreted as a relational contract. It is a pre-contractual relationship. Seeking friendship increases personal utility. I would not want to call it "friendship-rent-seeking" when a person tries to contribute to a friend's happiness. It is moral behaviour on the basis of Aristotle's *Nikomachian ethics*, or, if you want: *Christian ethics*.

I would like to express my gratitude to my friend Santiago Garcia on this occasion for many years of close friendship. I know that he is a man with an Aristotle utility function. My attempt to develop an economic theory of the firm with an Aristotle utility function has been motivated by our friendship. I am sure this theory can be extended to more general non-market relationships. It may be used as a theoretical basis for discussions on "Ethics in Business".

5. International Seminar on "Economy, Entrepreneurship, Science and Society in the 21st Century": Program

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A Tribute to Santiago García Echevarría

International Seminar

**Economy, Entrepreneurship,
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XXI Century**

Alcalá de Henares, 3rd November 2006

- 09.00 Accreditation
- 09.15 Opening of the scientific symposium
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Mr. Detlef Weigel, Minister Counsellor of the German Embassy in Madrid
Prof. Dr. Gregorio Rodríguez Cabrero, Dean of the Business and Economic Faculty of the University of Alcalá
Prof. Dr. Miguel Santesmases, University of Alcalá
Mr. Juan José Rodrigo Tobajas, President of Asociación de Amigos de la Universidad de Alcalá
- 10.00 **The Economics of Friendship among Scientists**
Prof. Dr. Horst Albach, University of Berlin
- 10.45 **Law and Ethics**
Prof. Dr. Rafael Alvira, University of Navarra
- 11.15 **A Case against Foreign Exchange Market Intervention of the ECB**
Prof. Dr. Wim Kösters, University of Bochum
- 11.45 *Coffee break*
- 12.15 **Developing a Leadership Company: Leadership as core competency of the firm**
Prof. Dr. Hans Hinterhuber, University of Innsbruck
- 12.45 **Retention Management for High Potentials**
Prof. Dr. Norbert Thom, University of Bern

- 13.15 **Advertising and the spirit of the age**
 Prof. Dr. Hermann Sabel, University of Bonn
- 13.45 Open discussion
- 14.45 Lunch
- 16.00 *Round table:*
"Economy, Entrepreneurship, Science and Society in the XXI century"
- Robert Fieten, Director of Management-Forschungs-Team, Cologne
 - Mr. Javier Ramiro, CEO Philips Ibérica, S.A.
 - Mr. Jordi Molina, Network Area.Coordination Aguas de Barcelona
 - Mr. Martin Corral, Regional Director Siemens, S.A
 - Mr. Antonio Castillo Holgado, Corporate Deputy General Manager Telefónica
 - Mr. Enrique Martínez Piqueras, President of UNICEM
- Chairmann: Dr. Robert Fieten Director of Management-Forschungs-Team, Cologne*
- 18.45 Closing of the Seminar
- Prof. Dr. Ubaldo Nieto, President of the Spanish Court of Audit
 - Prof. Dr. Santiago García Echevarría, University of Alcalá
- 19.15 Vino español

There will be simultaneous translation to Spanish and English

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301 / BROCKOFF, K. (2005): "*Techonological Change and Corporate Governance*", Alcalá de Henares, 30 págs.

302 / GARCÍA ECHEVARRÍA, S. (2006): "*Ajuste del Sistema de Educación Superior Español a las exigencias comunitarias*", Alcalá de Henares, 33 págs.

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304 / GARCÍA ECHEVARRÍA, S. (2006). "Ética y Globalización: Su integración e institucionalización (Problemas éticos en torno a la globalización)", Alcalá de Henares, 44 págs.

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