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The use of knowledge in an *entrepreneurial* society

(Problems of knowledge sharing and transfer)

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Legend: public-private partnership = PPP

1. Introduction

We are living in a knowledge society. In all systems of society, activities become based on knowledge, especially science-based knowledge. It is rare that a politician decides on anything without getting advice from scientists. Any major decision in a corporation is based on scientific knowledge. Professional football players or cyclists (but also pigs, cows and fish) eat what scientists tell them to eat. The knowledge economy is based less on the traditional inputs of labor, capital and natural resources, and more on the input of information, knowledge, ideas. Decision-making and entrepreneurial action will gravitate to those who own the knowledge.

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Everybody of us knows more and more. *At the same time*, we also know less and less. We know more and more about very specific things, the objects of our professional specialization, but we know less and less about everything else. This leads to the paradox, that increasing knowledge creates more non-knowledge and uncertainty and, as the economist says, the asymmetry of information and knowledge between those who know and do not know increases dramatically. The information/knowledge society is a society with an increasing level of uncertainty, of making decisions the consequences of which are becoming more uncertain.

This has some serious consequences, theoretical and practical.

The results of information and knowledge economics show forcefully, that the hypothesis that economies, organizations and individuals with imperfect information and knowledge would be similar to economies etc. with perfect information, has no theoretical basis.¹

Most knowledge, unfortunately, remains dead knowledge. Those who produced it, will take it with them to their grave. For the system of science, it is said, that the only people who are going to read the stuff, are those who write the stuff.

➤ Overview

Our paper is about social mechanisms for putting knowledge into practical use. We assume the existence, if only embryonal, of at least three functional systems of society: economic system, political system, science system.

We ask how through interactions between agents in the economic, political and science systems, knowledge becomes created and put into value-enhancing and utility-increasing use.

Talking about knowledge requires to understand what knowledge means (section 2). How actors get access to knowledge they do not own is the topic of section 3 (the Hayek problem). Owning knowledge is not the same as using it productively (the Schumpeter problem: section 4). This is followed in section 5 by a discussion of the types and mechanisms to overcome the Hayek and Schumpeter problem. The last section (6: Learning levels) looks into possibilities open to actors in the knowledge system, to increase their abilities to acquire and create knowledge and to innovate.

2. Explicit and implicit knowledge

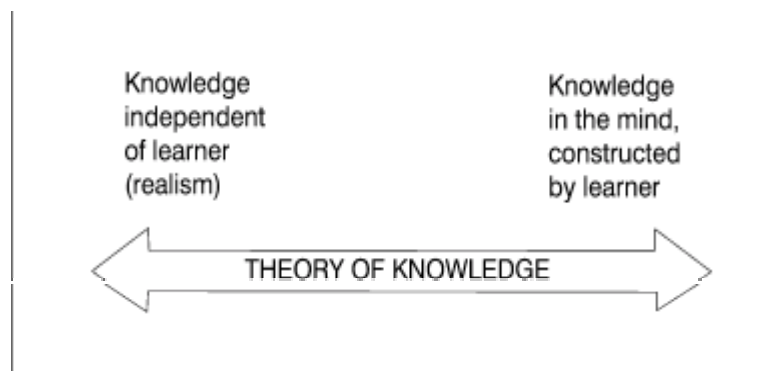
Although a lot is written about the importance of knowledge, less attention has been given to the manner in which knowledge is acquired, diffused and managed within organizations and networks. The purpose of this section is to make some basic

¹ For an extensive elaboration of this conclusion see Stiglitz (2000). Robert Stiglitz was for several years the head of research at the World Bank. He left his job when it became clear to him, that the World Bank and the International Monetary Fund were doing things, especially during the so-called Asian crisis (1997-2000), that contradicted fundamentally with his theoretical view about how economies with incomplete information function.

distinctions between various kinds of knowledge and ask what makes knowledge different from data and information.²

Our beliefs about knowledge, profoundly influence our approach to development, management and entrepreneurship. It makes a huge difference whether we believe that knowledge exists independent of the entrepreneur (manager, learner) or whether we subscribe to the view that knowledge consists only of ideas constructed in the mind (self-knowledge).

We can represent this dichotomy as a continuum, with the extreme views at each end, as illustrated below (source: Hein, 1995).



To understand the following discussion, I invite the reader to consider knowledge as being constructed by the entrepreneur. We argue, that both knowledge and the way it is obtained are dependent on the construction of the entrepreneur/learner. This is the position of the so-called (radical) constructivism. My knowledge is not your knowledge. It never can be. What you make out of the information you receive from me, how you make knowledge out of my information, depends totally on you. There exists only self-knowledge.

Our position that entrepreneurs/learners construct their knowledge leads us the question of what makes knowledge different from information and data.

➤ Data, information, knowledge

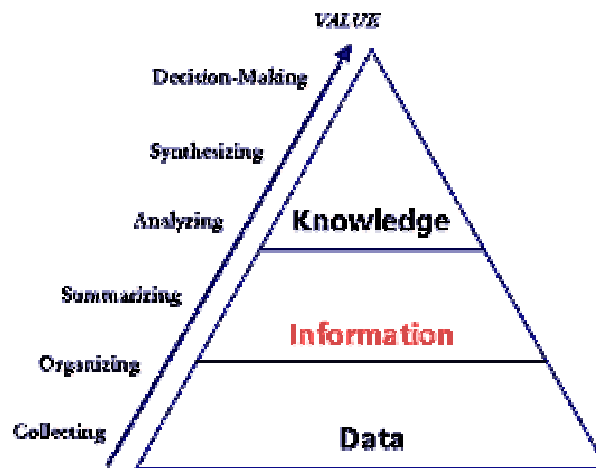
Data are the raw material of information. Data is the base of the pyramid of knowledge (see figure). Data is out of context and has no meaning. A collection of data for which there is no relation between the data is not information.

Is

36, 36, 33, 29, 28, 25, 24, 23, 23, 19

information to you?

² Information and knowledge are often used in the same manner (for illustrations see Stiglitz, 2000; or Feder (1997), summarizing a World Bank discussion; in the World Development Report of 1998/99, dedicated to the role of knowledge in economic development, knowledge and information was usually mixed up.



Whether or not it becomes information depends on the understanding of the person perceiving the data.

Data becomes **information** when we put it into a context. The person must give a meaning to the data, which makes it possible to understand why there are differences between the data (numbers).

Information is the difference that makes a difference

says the famous definition of Gregory Bateson (1979).

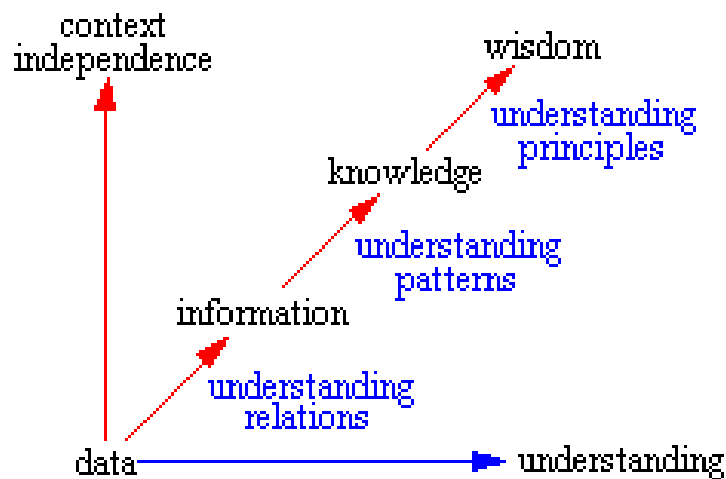
For me the data 36,36,33 ... make a lot of difference. Why? The data become information when I perceive them as the points achieved by the 10 highest ranking German football clubs in the premier league in their matches at a given point in time. It is me, who transforms data into information. The data now make a difference to me. And this difference is the information I get from the data. The information is my construction. For most of you, the information would not provide a foundation for why the data are what they are.

The information given in the ranking of the clubs is still no **knowledge** to you. Information becomes knowledge, if information becomes embedded in or is reflected by the experience of a person. I would be able to connect the names of the respective football clubs with the numbers. I would know that the second team with 36 points is Eintracht Frankfurt, which just a year ago was facing a survival crisis, a team that fired 4 coaches in one year, a team whose coach I even know, a team whose matches I was visiting with my children, etc.

In the following I cite two definitions of knowledge I consider useful within the constructivist framework of knowledge used in our paper.

Knowledge, no matter how it is defined, is in the heads of persons, and that the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience. What we make of experience constitutes the only world we consciously live in. . . . all kinds of experience are essentially subjective, and though I may find reasons to believe that my experience may

not be unlike yours, I have no way of knowing that it is the same. The experience and interpretation of language are no exception" (Ernst von Glasersfeld).



Source: Bellinger

Another excellent definition of knowledge is provided by Davenport and Prusak (1998):

Knowledge is a fluid mix of framed experience, contextual information, and expert insights that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In the organization, it often becomes embodied not only in documents or repositories but also in organizational routines, processes, practices, and norms" (Davenport and Prusak, 1997, p. 5).

To give another illustration for elaborating on the difference between data, information and knowledge.

In the World Development Report „Knowledge for development“ (World Bank, 1999, p. 17) we read:

„Knowledge is critical for development, because everything we do depends on knowledge.“

This sentence is first nothing more than **data**, consisting of letters. If you are ignorant of English, it will probably remain data.

For some of us, the statement may contain **information**. Try to get information out of it by looking for the something which makes a difference. I guess, for most of us, the information we get is meagre indeed. Information is difference. What is the difference in the statement. We could substitute capital, or water, or love or anything for knowledge, it would make no difference. The statement contains no information (for me; you may see it *differently*, get a difference which I am not able to construct). If the world bank would have written: „Drinking beer, or playing football, or meditation is critical...“, some of us may have got some information. Why? Because our mind would not consider these factors as really „critical for development“. They would thus make a difference in our mind.

Also **knowledge**-wise, the statement does not give us very much. But it always depends. Let us say, you would have been a co-author of the report. Reading this sentence, you may remember the hours of arguing over this sentence. You even remember that one co-author had a phone call from the US president concerning this sentence, because the president's adviser to the World Bank preferred a different formulation, etc. That means, because of your different experience etc., the statement is knowledge for you, knowledge about knowledge.

A few pages later on (p. 25, emphasis added) we read in the same report:

„Successful development thus entails more than investing in physical capital, or closing the gap in capital. It also entails acquiring and using knowledge – closing the gaps in knowledge.“

If we read this statement together with the first, the **information** content increases dramatically, at least for me. Now I am able to make differences: knowledge is the thing that makes successful development as something more than the accumulation of capital. Beyond capital, also the application of new knowledge is required. There are differences, that really, in *my* mind, make a difference.

In addition to information, I learn something new. As a neoclassical economist, I have been theoretically socialized to believe, that factor accumulation is all that really matters for development to occur. From my experience as a teacher and observer of the the world around me, I am now able to integrate experiences concerning the development of firms and nations into a new framework. I got new **knowledge**. Thank you, World Bank!

Characteristics of knowledge

- Knowledge and information are not the same.
- A collection of data is not information.
- A collection of information is not knowledge.
- A collection of knowledge is not wisdom.
- You can't redistribute knowledge
- Even if you succeed to share your knowledge with someone else, you still keep it.
- You can't leave knowledge to other people if you die.
- You can't take knowledge away.

- You can't prevent knowledge walking out the door.
- You can't give knowledge by decree.
- You can't transfer knowledge.
- You can't teach knowledge.

Implicit knowledge and practical intelligence

The way we define knowledge has already made clear the limits of transfer of knowledge. If knowledge is self-knowledge, the transfer of knowledge is constrained.

We need to go on step further, by making a distinction between tacit knowledge and explicit knowledge. Our contribution is focused on this distinction.

Karl Polanyi (1966) differentiates knowledge that is explicit to us from tacit knowledge. Explicit (self-) knowledge is, according to Polanyi, codifiable and transmissible in a formal and systematic language. We may think of technical expertise or rules, laws and regulations as two examples. Acquiring this kind of explicit knowledge is rather easy.

Tacit knowledge is difficult to convey and does not easily express itself in the formality of knowledge.

There are two aspects of tacit knowledge (Baumard, 1999, S. 59):

- A cognitive dimension: mental models, paradigms;
- A technical dimension: know-how, expertise applied to a specific context.

Tacit knowledge belongs strictly only to a specific person and is practically not available to others. It is difficult or impossible to communicate to others (the Hayek problem), and it is difficult or impossible to be applied by others (the Schumpeter problem).

„The nature of technology itself makes knowledge difficult to acquire. Because the properties of a technology cannot necessarily be fully documented, process optimization and product specification remain an art. The managerial skills that comprise such an art are themselves tacit rather than explicit“ (Amsden, 2001, S. 5).

Knowledge is mixture of codified and tacit components. Codified knowledge needs to be systematic enough to be written down and stored. As such, anyone can make use of it when he knows where to look it up. Tacit knowledge may be regarded as "residing in the heads of those working on a particular (problem) or to be embodied in a particular organizational context" (Gibbons et al., 1994, p.24). Most of what we know is hidden below the surface of explicit knowledge. Most knowledge resides within individuals. Tacit knowledge, in its purest form, cannot be articulated. Codified or explicit knowledge can more easily migrate, is more mobile and can move rapidly across organizational boundaries. Tacit or implicit knowledge is embedded into social relations or networks, its exploitation requires active participation in its generation.

Concerning the use of knowledge, we are confronted thus with three difficulties:

1. Available knowledge (explicit and/or implicit) may remain unused (the Schumpeter problem);
2. Tacit knowledge can *only* be used by its generator;
3. Codified and tacit knowledge may be complementary (so that both types of knowledge are required to make commercial use of it).

Practical intelligence

It has been known for a long time. People get high grades in school and university, and still not do not succeed at work. Many people, who are successful in their place of work, do badly in IQ tests. Entrepreneurs and managers, who have built large businesses from scratch are frequently discovered to be drop-outs from high-school or college.

There was one answer to this. Besides intellectual/academic intelligence, people need emotional intelligence (David Goleman, 1998). People need both emotional as well as intellectual skills. Emotional intelligence includes the abilities to motivate yourself and persist in the face of frustration; to control impulses, to delay gratifications, to regulate moods and keep distress from swamping the ability to think; and to understand and empathise with others.

It seems obvious, that people low on emotional intelligence will face difficulties in making productive use of information and knowledge.

Psychologists are quarelling with each other, whether academic and emotional intelligence are good predictors of success in real life.

Robert Sternberg (2000) believes, a crucial component of intelligence still to be missing: most of the really useful knowledge successful people have acquired is gained during everyday activities – but normally without conscious awareness. Although this knowledge is reflected in successful people's behavior, the people are often *unable to articulate* what they know. This is the kind of knowledge we call tacit. Professional „intuition“ and professional „instinct“ imply that the knowledge associated with successful performance may be tacit. This knowledge cannot be taught formally. You have to learn it by yourself and you have to apply it by yourself. Tacit knowledge or „practical intelligence“ (Sternberg), cannot be transferred to other people.

3. The Hayek problem

Knowledge is dispersed among the actors of an economy. A knows something B does not. How can B make use of the information/knowledge A has. Hayek does not distinguish between information and knowledge. His main focus is on implicit knowledge and the practical intelligence of the entrepreneur.

(1) Direct communication: A can tell B. He learns to share his knowledge. This only works with explicit knowledge, not with tacit knowledge (in the sense of Karl Polanyi).

If B knows what A knows, how about C,D, E, and so on. There are thousands, millions of people who may be interested in what A knows. A direct dissemination of knowledge faces the difficulties of limited resources of time and (transaction) cost. Hayek and Mises concluded from this analysis, that central planning, a kind of direct hierarchical communication, does not work.

(2) Hayek offers another solution, indirect communication: *competition as a discovery procedure*.

Building on the idea of the „invisible hand“ of Adam Smith, the great liberal economists of the 20th century – Ludwig von Mises, F.A. Hayek, Milton Friedman and others – have shown: The market involves a constant discovery process. It does not have rigid input-output relationships, it is a „non-trivial system“, as Heinz von Foerster says. The discovery process is driven by the entrepreneurial spirit, based on knowledge that is not centralized, but widely dispersed. Most of the knowledge is not even articulated. It is tacit knowledge, local knowledge, practical intelligence that is the essence of the economy.

Given adequate incentives and property rights, the discovery process mobilizes dispersed knowledge. Knowledge is built into prices. Prices become carriers of information. For instance, the price of gold reflects nearly everything that influences the supply and demand for gold. The death of South African miners, killed off by AIDS, and their (non-)knowledge about causes and protection, is contained in the gold price (for this reason I sold off my Rolex gold watch worth \$ 150,000 a long time ago and put the proceeds into a Swiss bank account).

(3) Beyond Hayek: The use of knowledge in a *functionally differentiated society*.

Knowledge is not only dispersed among actors of an economic system. Society consists of several functional systems (political system, juridical/law system, science, education, religion, etc). Each system produces knowledge. Each system has to handle the Hayekian challenge for itself.

And this produces another difficulty: The application of knowledge available in one functional system in another one. How can knowledge travel from one system (for example education) into another system (for example business)? How can an entrepreneur make use of knowledge produced in the science system? How can a professional coach in swimming (sport system) get knowledge about new training methods developed in science? In other words, we are confronted with the challenge of the diffusion of knowledge produced in different functional systems of society. There is no obvious solution within the Hayekian framework. The problems we are confronted with here go to the heart of the modern knowledge society. Knowledge needs to cross the boundaries of the functional systems of society to become socially useful. If knowledge created in the science system circulates only among scholars, we all would need first to become scientists to get access to knowledge, and then migrate to another functional system (economic, political etc) in order to apply it.

These difficulties are the theoretical entry point of interfunctional PPPs to be discussed in section 5. As we argue below, there have evolved several answers to these questions. They go right at the heart of the knowledge problem. One of the solutions is a public-private partnership (PPP).

(4) Just to say: let us transfer the knowledge from science to business does not work. *Who* is doing the transfer? Has the actor any *incentive* to do so? How about the *transaction costs* in transferring knowledge? How about sharing knowledge that is *implicit*? How to overcome the difficulty of „translating“ information in *self-knowledge*.

Knowledge transfer does not work.

4. The Schumpeter problem

Our discussion so far has remained inadequate in a critical sense. Even if knowledge is diffused within a functional system (say the economy), that is, the Hayekian problem is somehow solved, knowledge may still remain unused. To know something and to make productive use of it, are different things. This holds for both explicit and implicit knowledge. To make use of knowledge, we need people willing and able to use it and endowed with the right to use: Motivation, competence, property rights. We call these kind of agents entrepreneurs.

The World Bank on the Yogi trip

When the World Bank writes on closing knowledge gaps between rich and poor countries as critical for development (World Bank, 1999, see citation above), that is OK as far as it goes. There is a serious omission. The Bank leaves out entrepreneurship. Even bridging the knowledge gap does not result in development and poverty reduction, if people are unwilling or unable to make productive and ethical use of the knowledge (We give illustrations below).

„He knows everything and can do nothing.“ With these words the Russian wisdom teacher Gurdjieff characterizes the „way of the yogi“ (cited in Ouspensky, 1999, p. 66).

To know that smoking kills your health, that every cigarette reduces your life expectancy by ten minutes, does not result in stopping smoking.



The knowledge remains dead for you, because you do not apply it in your own context. There is a gap between what you know, your knowledge, your insight into something, and what you actually do with what you know and what you can. You must energetize your knowledge and competences.

To give another example from a field, in which many public-private partnerships (PPPs) are actively engaged. 90 percent of people know what causes AIDS and know that and how they can protect themselves. Despite this knowledge, the epidemic has continued to escalate. Millions of people have *known* they are at risk of infection, have *known* how to protect themselves, but have not done so. The virus spreads because people, for a variety of reasons, can't or don't take action to protect themselves.

A further illustration: It has long been known, that most of what is learned at a university becomes never applied by the students in their professional lives. For Germany, it has been estimated, that 60%-70% of the knowledge students acquire, will be lost, i.e. is not applied in practice. There are many reasons for this sorry state of affairs. But they all seem to boil down to the same overriding factor: entrepreneurship. Entrepreneurs are those who apply knowledge for solving problems in their businesses or their professional work, they create new value added, new wealth, additional employment, more taxes and so on by creating and implementing opportunities with new knowledge.

Knowledge alone is not enough.

We may own and transfer as many knowledge as we want – without people making use of it, without application, the knowledge remains, economically speaking,

dead knowledge

Let us imagine, entrepreneurs enter in sorting out the difficulties of dead university knowledge. Let us say, a public-private partnership is established, to look into this problem, propose solutions, and has been endowed with rights for implementation.

We immediately see four fields in which entrepreneurial action can take place:

- ♦ *Students* need to acquire competences for active learning, communication and other skills for disseminating the knowledge in their work places and so on.
- ♦ *Teachers/professors* must learn new teaching methods, move to „constructivistic“ pedagogics, teach more „relevant topics“, apply what they preach in the classroom, etc.
- ♦ *University administrators* will have to change the incentive system for teaching and research, provide more freedom for experimentation, allow more involvement of teachers in practical work outside the university and so on.

- ♦ The *partnership* must somehow learn to apply the knowledge (including tacit knowledge) owned by itself and that of the aforementioned actors to the problems at hand.

All four will have to perceive and reflect, that there is a problem at all: problem consciousness. If they believe everything is OK, there will see no need for change. In addition, the entrepreneurial actors must have competence consciousness. If they believe, with *me* everything is Ok, my learning methods do not need changing, my teaching is good, my examination routines (ask the students what I like to hear) don't need change, and so on, i.e. my competence does not need to improve, there will be no change.

These are formidable conditions. Their lack explains to a large extent, why schools/university-reform usually fails and why innovative teaching and training becomes established not in incumbent systems, but in new players in the education system. We see know the core of the Schumpeter problem. The transfer of knowledge from one system (firm/organization, science, university, the R&D department) to another (economy, politics, production/marketing) does only work with codifiable (explicit) knowledge (after it has been transformed into self-knowledge) – **given entrepreneurial incentives and rights to action**. In this case, knowledge can be treated as an "input" or as a "resource" (but still requires entrepreneurs to put it to use).

In an entrepreneurial knowledge society characterized by implicit knowledge, the challenge is far bigger: Either the knowledge produced becomes used by those who generate and have acquired it by their own endeavour and learning, or it remains literally dead. Those who own the knowledge must use it. They cannot give it to others. Practical intelligence is totally personalized.

Entrepreneurship has to be built into the public-private partnership, organization, science/university, etc., since the "output" of the the system cannot become transferred to become an "input" into another system. Knowledge must migrate together with its generators. Or as Valéry (1999, p. 21) says: "Real innovations do not move from laboratory to shopfloor as patents, research reports or even working prototypes. To stand any chance of success, they have to be transferred as concepts *embedded in people's heads*" (emphasis added). In other words, "technology transfer" works only if together with the knowledge the people themselves are transferred.

Alice Amsden has come to an interesting conclusion concerning the importance of foreign ownership of manufacturing assets in developing countries:

„The later a country industrializes in chronological history, the greater the probability that its major manufacturing firms will be foreign-owned“ (Amsden, 2001, S. 286).

If our analysis is right, we come to a very similar conclusion for *all* kinds of interactions between actors of post-industrial societies and developing countries. The lower a country is situated on the development ladder, the higher will be the degree of participation of foreign actors in the development process. This is not for

imperialistic reasons, not in order to exploit, not to achieve super-normal profits, not for reasons of greed, etc. The reasons are simpler:

1. If new knowledge has to be applied to develop a region, those who own propriety (explicit) knowledge must enter the process. It will be they who take the crucial „development decisions“ (A. O. Hirschman) at the level at which they operate.
2. If tacit knowledge/practical intelligence is needed to establish and manage value-creating processes, the conclusion is the same: the owners of tacit knowledge *must* participate.

We have now three conditions for the productive use of knowledge:

1. Explicit knowledge needs to be applied (with or without the original producer or owner of the knowledge).
2. Implicit knowledge must migrate or transfer together with the people who own it.
3. Knowledge owners must become entrepreneurs.

4. Entrepreneurship in public-private partnerships

In this section we discuss solutions found in practice to overcome the Schumpeter problem: the non-use of explicit and implicit knowledge. We focus on entrepreneurship beyond the standard case of private and corporate entrepreneurship.

1. State entrepreneurialism

Officials within the state bureaucracy establish their own businesses while remaining employed by the state:

- a. legally
- b. under cover

There are many variants. From an entrepreneurial point of view, we have business run by the officials themselves or bureaucrat-owned, but privately managed firms (Ali-Baba). The latter is widespread in Southeast Asia and historically in China before the Communist Revolution.

The first variant is a kind of entrepreneurialism now common in China (Duckett, 2001). In some areas of China as many as 70% of state and party departments have set up their own businesses. „Many officials in China are now no longer just plan implementers, but also entrepreneurs“ (Duckett, p. 31). In China, as a state official succeeding in business, you become a hero. In Western countries, you go to prison. Again in China, it is common, that universities and research organisations venture into business.

Seen from a Schumpeterian point of view, the double challenge of implementing knowledge and getting access to financial capital is met. First, from the point of view of solving the knowledge problem, state entrepreneurialism offers an effective solution. Explicit and implicit knowledge became applied with low transactions costs. There is no transfer problem. The very people who own the knowledge have the right³ and are willing to make use of it. Second, financing for the venture is done by the state itself, a kind of self-financing, overcoming the difficulties of informations-asymmetries in capital markets.

The Young hypothesis or: Poor China

Allyn Young was one of the first who questioned the „Asian miracle“. He suggested, that the growth of most of the East Asian economies can be „fully accounted“ for by the increases in their inputs, there is nothing miraculous – a view now questioned by the World Bank (see our discussion above; see also World Bank, 1999, p. 21 for a summary of the argument; for a fuller account of the discussion, Röpke, 1997).

Recently, Young has done it again (Young, 2000). He argues that the new market economy of China is far less efficient than its old planned economy. Trade barriers between provinces prevent an optimal allocation of resources and specialization according to comparative advantage. There is no free trade inside China. „There is every indication that the economy of China, while opening up internationally, has become fragmented internally“ (p.1128). Local protectionism abounds. The market is fragmented. Fiefdoms controlled by local officials with economic and political ties protect local firms. The Chinese population pays the cost for all this with reduced welfare.

How do Young's arguments fit in our discussion? [All five types of PPPs are relevant to Young's argument.] Accepting the empirical foundation of Young's research, the first question: What would have happened to local entrepreneurship, many of it PPPs in nature, if internal free trade had been the rule? There can be no question, that new – if protected – firms entered the market, and that these firms created additional value and jobs. Young perceives this fact negatively when he states, that „the development of competitive local industrial policies [a type of PPP, see below] ... at the different provinces duplicated each other's industries“ (pp. 1093-4). (The Chinese economy is since more than a decade the fastest growing economy in Asia). That is, new knowledge entered the economy. While allocation was distorted, the new knowledge, technology and products introduced (i.e. innovations according to Schumpeter) may far have

³ In nearly all Western societies, this kind of right is nearly absent. If a public service employee is engaged in business activity, not even for his private account, he runs into serious difficulties. The resistance to state entrepreneurialism is beginning to weaken for the simple reason, that state departments are running out of money and urgently need no sources of income. A case in point are agencies in public research facilities and universities, marketing knowledge of their researchers via licenses and patents. This is described in more detail in Röpke (1997).

outweighed the loss of welfare reported by Young. Young's arguments seem a replay of the centuries' old discussion about the merits of free trade vs. protection. Schumpeter (1931, our emphasis) has put forward the central argument already 70 years ago in a lecture in Japan: „(...) the infant industry argument [protection of the home market] has *some* validity. And it is only a **special case of a much larger truth**: That protection and other interference with international trade may help **to create new things** and make it **easier** for progress in methods of production and industrial organisation to come about.“

What Young is doing is OK within his theoretical framework of general equilibrium analysis. If this theoretical structure is used to explain a developing, non-stationary economy, we end up in nirvana thinking: Comparing an allocationally imperfect situation with optimal allocation in a nirvana state.

2. *Development state*

The government undertakes developmentally-oriented activities through encouraging and supporting particular industrial sectors (industrial policy), allocating credit into targeted sectors and firms, promoting exports, fostering technological innovation, etc. This is what Robert Wade (1990) describes as „governing the market“. The development state model is clearly different from state entrepreneurship. The government could leave all production in the hands of private entrepreneurs and still „govern“ the private sectors activities. Obviously, development state and state entrepreneurialism can be combined also, which may lead to conflicts of interest within the bureaucracy.

We have an ongoing discussion on the merits of the development state. The economic rise of East Asia is constructed by neoliberal authors as the result of market forces, by their critics as an illustration of successful government intervention. Both camps make ample use of the knowledge argument to defend their positions.

Liberals: The state bureaucracy and credit targeting banks have no privileged access to knowledge. „Picking the winners“ is an exercise in futility. The Asian financial crisis of 1997-2000 and the decade long stagnation of the Japanese economy since 1990 have played into their theoretical hands.

Interventionists: Most industries in latecomer nations (from the U \$A in the 19th century until China in the 21st, started as import substitutes and the home basis facilitated knowledge creation and learning. „National leaders“, says Amsden (2001, S. 193) „all shared one characteristic: they tended to be a product of government promotion (,targeting‘).“

3. *Private production of collective goods*

Examples: Private firms build and manage roads; public health initiatives are carried out by or in cooperation with private firms; land management⁴, delivering water and sanitation services, etc.

These cases include so-called PPPs defined as collaborative programmes between the public sector and (a) the for-profit section, (b) the non-profit section (f.e. cooperatives) or NGOs of the private sectors.

4. Networks of private and government actors

This is a further type of PPP. What follows are illustrations:

(1) Overseas Chinese networks

Southeast Asian economies are dominated by Chinese entrepreneurship. They operate in networks among themselves and with the respective governments and often military units.

In the Overseas Chinese bamboo networks, contracts can be sealed by a handshake, without a lawyer, accountant or consultant in sight. Superior technological competence of western firms is overcompensated by lower transactions costs. The networks are low-cost arrangements for the acquisition and use of information and knowledge. The additional link up of the entrepreneurs with the government makes them formidable competitors for local entrepreneurs and foreign firms.

(2) Financial networks

Overcoming market failure in the financial market was an important cause of the Asian miracle. Close relations between government and industry, cooperative interactions, networking arrangements and lending by government controlled banks mastered the problems of asymmetrical information responsible for hidden action, adverse selection and moral hazard in financial markets to a substantial degree (Wade, 1990; Stiglitz, 2000). This made possible the "high debt model" that fuelled the miracle.

Paradoxically, these very same PPPs, left uncontrolled, and degenerating in part into collusion and cronyism, sowed the seeds for the undoing of the miracle. Trust, harmony, and cosy relationships built into the interactions between lenders and borrowers as they emerged during industrial policy targeting fuelled an unsustainable boom, the final stage of the miracle rocket - *even if we leave out any corruption and nepotism* -.



(3) Industrial policy and the creation of technological competences

⁴ Many of the National Park Service units created over the past years in the US are called „partnership parks“ because the federal government, who does the management, owned little if any of the land within their boundaries.

Industrial/technology policy is the quintessential type of a PPP.

a) A private technology leader nourished by industrial policy and government patronage tended either to be an affiliate of a diversified business group (conglomerate, zaibatsu, keiretsu), a type of entrepreneurship discussed below; or a state spin-off (joint venture between the government and a foreign technology leader; a „model factory“ with a mixture of state, foreign and private national ownership; a defence contractor). In all these variants, knowledge transfer was crucial: how to get access to (foreign) knowledge and how to learn to apply the knowledge.

The built up of practical intelligence, the creation of implicit knowledge has been the critical factor in making these ventures successful. Since the government or a cash-rich foreign entity became involved, financing was not as critical as it would have been, had knowledge creation and application to be financed in highly imperfect capital markets.

b) While in late-industrializing economies most of these ventures were not at the frontier of knowledge, practically the same process was/is used in the creation of high-tech industries in post-industrialized societies (Amsden, 2001, S. 194; Norton, 2001). Firm-level targeting was transacted through public research institutes or science parks. „Picking winners“ is built-in naturally in this process.

In late-industrializing countries of the West and Japan, PPPs have become a key component of technology policy and a tool for improving national competitiveness (Cervantes, 1999). Japan has been a leader in this field. Japanese high-tech can be considered a result of government-sponsored industrial technology programmes. The skeptical USA was won over by the early 1980s, when the alleged success of Japanese collaborative R&D and growing global competition lead to paradigm shift in the United States.

5. Corruption and profiteering

Bureaucratic corruption, profiteering and speculation are widespread in many countries (the whole of Africa, China, India, Indonesia). Small corruption and profiteering is a normal way to provide incentives to employees in the public sector of any country.

In China, many state businesses were set up in the late 1980s for simply profiteering on the basis of the dual track (state and market) pricing system.

Public firms/authorities cooperate or transact with private units (firms, consumers) to achieve private benefits by granting specific advantages (corruption) or making use of public facilities for private advantage or making private use of preferential access to information and regulative procedures.

Looking for the causes of Asian financial crisis, Pye asked: “How could the same cultural patterns that once produced ‘miracles’ now produce disasters?... how much the same behavior patterns could both lift economies and then hurl them into deep trouble”? (Pye, 1998, p. 139). We can ask the very same question concerning the mutation of one PPP into another variant: the shift from networking into nepotism, from collaboration to corruption.

6. Learning and the levels of knowledge creation

Width and depth in learning: operational modes of entrepreneurial systems

Level of learning	Knowledge	Operation	Competence	Energy
Learning 0	Given	Routine	Given	Unconscious
Learning 1	New	Innovation	Given	Unconscious
Learning 2	New	Competence	Variable	Unconscious
Learning 3	New	Reflection	Variable	Conscious

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