

# RISK TAKING UNDER TRANSITION: AN EMPIRICAL COMPARISON BETWEEN CHINESE, WESTERN-, AND EASTERN-GERMAN MANAGERS

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## Abstract

Even after 10 years, countries under transition are still on their way to becoming developed, internationally competitive countries. At this stage it is helpful for business cooperation to know whether managers in countries undergoing transition are behaving like socialists or Western managers, or somewhere in between. Many joint ventures and other alliances between Western companies and companies in countries in transition are seeking to establish new markets with new products or new technologies (i.e., new processes). They are risky because the returns are uncertain. Understanding the risk attitudes of managers in countries in transition can explain different investment behavior and provide vital information for installing the right incentives. This study compares the risk attitudes of Chinese, eastern, and western German managers. Chinese managers' risk attitudes seem to be more similar to the attitudes of western German managers than to those of their counterparts in eastern Germany. Some of the reasons and consequences are discussed in this article.

## Introduction

Even after 10 years of transition there seems to be many differences in management behavior between countries under transition and Western countries. This study examines the risk-taking behavior of Chinese, eastern, and western German managers.

From the management point of view, transition means making the company competitive for global or international markets. To turn companies into competitive organizations, managers in countries under transition have to invest into product or process innovations (among others). Obviously these investments are risky. Whether managers in countries under transition take the risk or not is determined by their risk behavior. The focus of this article is whether the risk behavior in China and in eastern Germany as regions under transition differ, or are different to western Germany as an example of a developed Western economy.

Knowing that differences in risk-taking behavior exist is crucial, especially for cooperation projects in countries where Eastern and Western managers with their different backgrounds are working together. It helps to evaluate and understand the decisions of the cooperation partner which may, under certain circumstances, have a totally different basis. Thus, knowing the risk attitudes of people to cooperate with is very helpful for understanding different project evaluations. For Western managers cooperating with eastern German or Chinese managers this article will serve as a basis for understanding different risk attitudes and behavior in these economic regions and therefore understanding investment decisions involving product and process innovations.

## Innovation, Risk and Return

Especially in countries under transition, product and process innovations are key factors for economic development. A frequently used definition of innovation by Knight reads: "Innovation is adoption of a change which is new to an organization and to its relevant environment" (Knight, 1967, p. 478). Innovations can be classified according to many criteria. A common classification is product, process, and social.

Product innovation refers to either a new product or the improvement of an existing one. Often companies consider a product as an innovation which they had not previously produced, even if this product had already been marketed by other companies. In our article we will use this definition. With the term process innovation we mean either a new or an improved manufacturing process in which the application of new knowledge results in increased productivity or quality in the production process.

Social innovations involve either changes in norms or changes in the forms of interaction between individuals or groups of individuals (Rogers & Shoemaker, 1971). If innovation is one side of the coin, risk is the other. There is no investment into an innovation or into change without risk. The concept of risk has been defined in different ways in literature. We will follow Knight's definition which distinguishes between risk and uncertainty (Knight, 1967). Risk is defined by a decision situation where an a priori probability or where a posteriori statistical probability exists, and uncertainty is a decision situation without any probabilities.

On the other hand innovations are accompanied by an expected return which can compensate the risk of the decision maker. So it is self-evident that investments in innovations are made because of the expected returns, but both risk and return determine the decision situation. A positive correlation between profit expectation and risk-taking attitude is assumed in the portfolio-selection theory (Markowitz, 1959) and similar in the risk-analysis model of Herz (Herz, 1969).

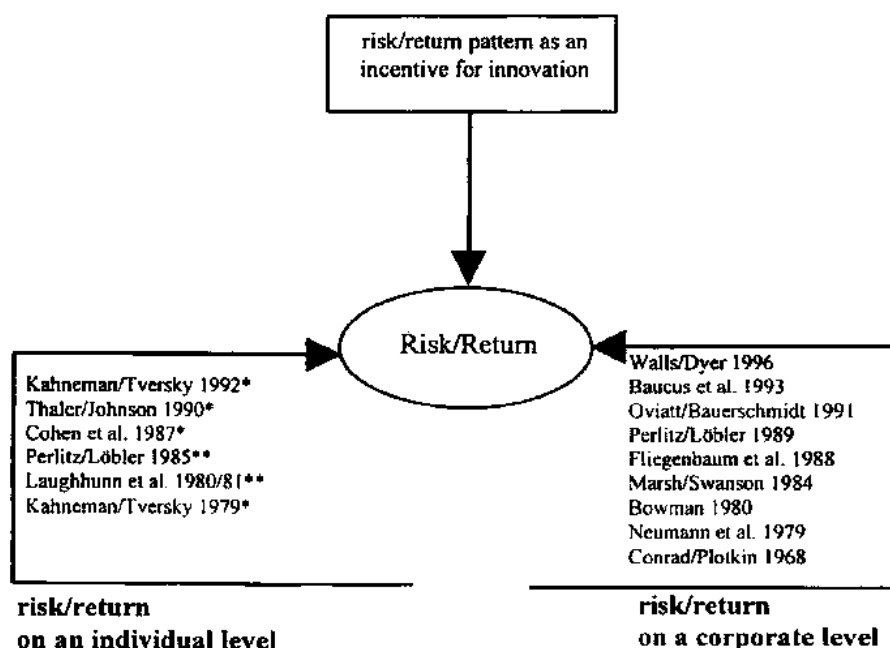
However, the hypothesis of a positive correlation between profit expectation and risk-taking behavior in investment or innovation decisions (i.e. a positive correlation between risk and return) is not undisputed. Bowman, for example, found that highly profitable American

companies showed a lower willingness to take risk than less-profitable ones (Bowman, 1982, p. 33). Bowman's findings for US managers were confirmed for (west) German managers by Perlitz and Löbner (1995). In the early 1980s it seemed paradox that risk and return were not positively correlated as it was written in all textbooks. So Bowman called it a risk/return paradox. Further investigations of this phenomenon showed that decision theory had to be rewritten with respect to this. A new approach in decision theory called prospect theory now explains this paradox as follows: If a return is negative from the decision maker's point of view, he or she behaves like a risk seeker. If the return is positive from his or her point of view, he or she avoids risk. The positive correlation holds only in the positive return case. But the prospect theory is only based on empirical results of Western managers in market economies. Socialist managers had not yet been included. We do not know whether managers from former socialist countries have the same risk attitudes as their Western counterparts, even after 10 years of transition. This article provides a step toward closing this gap.

Many empirical studies have analyzed risk/return patterns. Figure 1 distinguishes those studies which focus on analyzing the risk/return pattern on the corporate level from those which focus mainly on an individual level. The consequences of the results of these studies are discussed broadly in Perlitz & Löbner (1995). What are the risks (chances) involved in innovations?

To get information about chances of success of product and process innovations, it is helpful to look at the results of empirical surveys. An empirical study of innovations with 700 producers of consumer and capital goods conducted by Booz, Allen, and Hamilton (1982) has shown that only 25 percent of the product innovations succeeded on the market. In contrast process innovations seem to be more successful. Cooper and Kleinschmidt (1993) investigated 103 innovations in the chemical industry in North America and Europe: 69.2 percent of the 52 process innovations turned out to be successful. An investigation of innovations in mechanical engineering industry conducted by Schewe supports the results for process innovations. Only 28 percent of the 39 process innovations failed (Schewe, 1992, pp. 967).

Roughly speaking, the probability of success of a product innovation is 25 percent, and of a process innovation it is 75 percent. In addition we know that the distinction between positive and negative returns is important for judging the risk attitude. We used these probabilities to design the following decision alternatives.



**Figure 1.** Synopsis of Former Studies: \*, Research was based on student's decision making, \*\*, Research was based on manager's decision making.

## Decisions Alternatives

We offered four decisions with two alternatives each to managers of the previously mentioned countries who were responsible for investment decisions in their companies. In the first situation the company is in a profit situation. We call this situation the opportunity case. In the second situation the company is in a loss situation. We call this situation the crisis case.

These two situations (opportunity and crisis) and the two types of innovation (product and process) result in four decisions for the managers to make. Each decision has two alternatives: a risky and a nonrisky one (see Table 1 and Table 2).

In the opportunity case, the secure alternative is reflected by a return on investment (ROI) of 10 percent with a probability of  $P = 1$ . Sometimes a continue-as-now decision seems to be a riskless alternative in a profitable situation; therefore, we call this alternative a continue-as-now decision or a secure investment. For the uncertain alternative of decision 1 (process innovation), we assume a 75 percent probability of a 15 percent ROI with a remaining 25 percent probability of a 0 percent ROI. The expected return is therefore 11.25 percent. In decision 2, the product innovation is reflected by a 25 percent probability of a 45 percent ROI with a remaining 75 percent probability of a 0 percent ROI, which also results in an expected return of 11.25 percent. As already mentioned, process innovations are typically characterized by potential for improved returns and limited risk. Thus, the uncertain alternative in decision 1 corresponds to a process innovation, whereas the uncertain alternative in decision 2 corresponds to a product innovation.

**Table 1. Different Alternatives**

		No Risk	Risk
Opportunity	Decision 1	Continue as now/secure investment	Process innovation
	Decision 2	Continue as now/secure investment	Product innovation
Crisis	Decision 3	Continue as now	Process innovation
	Decision 4	Continue as now	Product innovation

**Table 2. Decision Alternatives**

		No Risk <sup>a</sup>		Risk	
Opportunity	Decision 1	ROI 10%	$P = 1$	ROI 15%	$P = 0.75$
				ROI 0%	$P = 0.25$
	Decision 2	ROI 10%	$P = 1$	ROI 45%	$P = 0.25$
				ROI 0%	$P = 0.75$
Crisis	Decision 3	ROI -10%	$P = 1$	ROI 0%	$P = 0.75$
				ROI -45%	$P = 0.25$
	Decision 4	ROI -10%	$P = 1$	ROI 0%	$P = 0.25$
				ROI -15%	$P = 0.75$

<sup>a</sup> $P$  = probability.

In the crisis situation, we assume a certain loss of 10 percent which could in real life result from a continue-as-now decision which seems riskless but not very helpful for the company. The first uncertain alternative set against the certain loss (decision 3) is characterized by a high probability ( $P = 0.75$ ) that the company can achieve breakeven (i.e. ROI = 0 percent) which would lead out of the loss situation. However, there is a 25 percent probability that the company

will come out with a ROI of -45 percent. This decision corresponds to a process innovation which can lead to rationalization within the company. But if the rationalization within the company is not successful, the company will lose its competitiveness and this will lead to the high losses assumed here. The expected return of this innovation alternative is -11.25 percent. The second uncertain decision in a crisis situation (decision 4) is characterized by a 75 percent probability of suffering a negative ROI of 15 percent with a remaining 25 percent probability that the company will reach the break-even point (ROI = 0). Given the 25 percent probability that the company will come out of the crisis, this uncertain alternative corresponds to a product innovation, and its expected return is also - 11.25 percent.

## The Sample

These four decisions with two alternatives each were presented to 230 managers from western Germany, 187 managers from eastern Germany, and 51 managers from China. All worked in large companies (>200 employees) and all were responsible for investment decisions. Table 3 shows the age distribution of the three groups of managers in percent.

**Table 3. Age Distribution of Managers in Sample**

Managers	≤30	31–35	36–40	41–45	46–50	51–55	≥55
Western German	2.2	10.8	26.6	28.8	16.5	12.9	2.2
Eastern German	2.7	11.2	30.5	25.1	16.6	11.2	2.7
Chinese	2.5	10.7	25.4	26.9	18.3	14.1	2.1

## The Results

Table 4 shows the results for the process innovations. While 60.9 percent of the western German managers in the opportunity situation prefer the certain alternative (continue-as-now or secure investment), 51 percent of the Chinese managers and 57.8 percent of the eastern German managers prefer the process innovation in this situation. Thus, western German managers tend to be risk averse in the opportunity situation. In contrast the majority of eastern German managers and Chinese managers choose the risk in the opportunity situation. This means that they are less risk averse compared to their counterparts of western Germany.

The crisis case has shown that 85.1 percent of the Western managers opted for the more risky process innovation over the continue-as-now alternative, even though the expected return (-11.25 percent) of a process innovation is lower than the continue-as-now alternative (-10 percent). That is also the case for Chinese managers, where 70.8 percent preferred the process innovation; and for the eastern German managers, where 58.3 percent decided in favor of the process innovation. That means that in a crisis situation, a process innovation is chosen considerably more often than in an opportunity situation. Western German managers who are risk averse in an opportunity situation become risk takers in a crisis situation. While nearly half of the Chinese managers are risk averse in an opportunity situation, most of them also become risk takers in a crisis situation. In contrast, eastern German managers are less risk averse in an opportunity and less risk seeking in a crisis situation.

Table 5 compares the certain alternative of an investment or the continue-as-now scenario with a product innovation. It shows that in an opportunity situation the certain investment or continue-as-now scenario is preferred to the uncertain product innovation by 80.7 percent of

the western German managers, 74.8 percent of the eastern German managers, and 58.8 percent of the Chinese managers. The managers chose the certain alternative (10 percent), although the expected value of return is lower than that of the uncertain alternative (11.25 percent).

In a crisis situation, however, the continue-as-now scenario is chosen by 28.7 percent of the western German, 67.9 percent of the eastern German, and 43.8 percent of the Chinese managers, whereas the alternative of product innovation is selected by 71.3 percent of the western German, 32.1 percent of the eastern German, and 56.3 percent of the Chinese managers. In the opportunity situation, the majority of all managers prefer the certain alternative. In the crisis situation only the eastern German managers prefer the certain alternative.

**Table 4. Attitude toward Risky Process Innovations**

Situation	No Risk Continue-as-Now			Risk Process Innovation		
	Western G.	Eastern G.	China	Western G.	Eastern G.	China
Opportunity	60.9%	42.2%	49%	39.1%	57.8%	51%
Crisis	14.9%	41.7%	29.2%	85.1%	58.3%	70.8%

Note:  $N = 187$  (Eastern Germany),  $N = 87$  (Western Germany),  $N = 51$  (China).  
 Significance levels for different results between two countries: \*) not significant;  
 \*\*) significance  $< 0.05$ ; \*\*\*) significance  $< 0.01$ :  
 Opportunity situation Crisis situation  
 \*\*\*) Western G.–Eastern-G. \*\*\*) Western G.–Eastern G.  
 \*\*) Western G.–China \*\*) Western G.–China  
 \*) Eastern G.–China \*) Eastern G.–China

**Table 5. Attitude toward Risky Product Innovations**

Situation	No Risk Continue-as-Now			Risk Product Innovation		
	Western G.	Eastern G.	China	Western G.	Eastern G.	China
Opportunity	80.7%	74.8%	58.8%	19.3%	25.2%	41.2%
Crisis	28.7%	67.9%	43.8%	71.3%	32.1%	56.3%

Note:  $N = 187$  (Eastern Germany),  $N = 87$  (Western Germany),  $N = 51$  (China).  
 Significance levels for different results between two countries: \*) not significant;  
 \*\*) significance  $< 0.05$ ; \*\*\*) significance  $< 0.01$ :  
 Opportunity situation Crisis situation  
 \*) Western G.–Eastern-G. \*\*\*) Western G.–Eastern G.  
 \*\*\*) Western G.–China \*\*) Western G.–China  
 \*\*\*) Eastern G.–China \*\*\*) Eastern G.–China

Table 6 gives an overview of the preferences for the western, eastern German, and Chinese managers in terms of secure investment, process, and product innovation. As Table 6 shows, the risk preferences are the same for eastern German and Chinese managers in the opportunity situation. In the crisis situation, however, the preferences of the Chinese managers are similar to the risk preferences of the western German managers. What can be said about the risk attitude of the managers in general? Of course the no risk alternative is less risky than the risky alternatives (product and process Innovation). The risk of the risky alternatives, which have all the same expected return, can be assessed according to the criterion of Rothschild and Stiglitz (Sarin & Weber, 1993, p. 140). Following this criterion, a lottery (random variable)  $Y$  is more risky than  $X$ , if their cumulative distribution function  $G$  and  $F$  fulfill the following inequality:



$$T(x) = \int_{-\infty}^x [G(t) - F(t)] dt \geq 0 \text{ for all } x$$

Using this criterion and the managers decision results, one can determine the risk attitudes shown in Table 7. As Table 7 shows, managers from western Germany and eastern Germany, although living in the same economic system since 1990, have significant differences in their risk taking behavior in both situations. Managers from China and West Germany, however, behave quite similar in the crisis case, despite their cultural distance. Surprisingly, most of the Chinese managers, like their western German counterparts, show risk-seeking behavior in the crisis situation. In this situation, Chinese managers are more similar in their risk-taking behavior to the western German than to the eastern German managers. In an opportunity situation the Chinese managers, like the eastern German managers, are taking more risks than the western German managers. In total, eastern German managers are least risk sensitive while western German managers are the most risk sensitive decision makers.

**Table 6. Preferences**

Situation	Western Germany	Eastern Germany	China
Opportunity	No risk	Process innovation	Process innovation
	>Process innovation	>No risk	>No risk
	>Product innovation	>Product innovation	>Product innovation
Crisis	Process innovation	Process innovation	Process innovation
	>Product information	>No risk	>Product innovation
	>No risk	>Product innovation	>No risk

Note: > means is preferred to.

**Table 7. Risk Attitudes**

Situation	Western Germany	Eastern Germany	China
Opportunity	High risk aversion	Low risk aversion	Low risk aversion
Crisis	High risk seeking	Low risk seeking	High risk seeking

## Conclusion

The common economic and political background of the eastern German managers and their Chinese counterparts could serve as an explanation for their similar risk-taking behavior in the opportunity situation. Even today, the decision-makers in eastern Germany and China have spent a considerable part of their training and working life in a socialist economy and in a totalitarian political system.

Under the past system, central planning was the basic mechanism of coordinating the economic actors. Plan fulfillment was the measure of a manager's success. The planning prescribed the quantitative, nonfinancial targets, like output of a steel mill measured in tons. Managers had little or no influence on the goal-setting process.

This central planning inhibited the innovative behavior because the plans were based on items which did exist, not on items which still needed to be created. Even the R&D budget was planned for the whole economy by a central department. The managers could neither apply for

an R&D budget nor did they necessarily get one. Therefore, the managers had no opportunity to make risky decisions on the organizational level.

In addition to creating these limitations in the organizational context, the high degree of socialist political order in these regions also reduced the need for risky decisions in every day life. Life tended to be predetermined, with limited individual freedom in making decisions on, for example, the field of training or study, employment, residence, goods consumed, savings, and social security. Neither at work nor in their private lives were managers able to develop a sensitivity to risk.

One might argue that today the differences in the economic and political systems between East and West are virtually nonexistent in the case of Germany and shrinking rapidly with respect to China. Nevertheless, the finite speed of learning justifies the assumption that today's managers are still formed by what they experienced in the past, and in this case the sensitivity to risk is still not fully developed.

While the Chinese managers behave more similarly to the eastern German managers in the opportunity situation, they behave more similarly to the western German managers in the crisis situation. Therefore, the risk sensitivity of Chinese managers lies between the risk sensitivity of eastern and western Germans. A simple, yet evident, explanation for this finding could be that the Chinese managers have had more opportunities than the eastern Germans to learn decision making in crisis situations.

Evident differences between the transition policies of eastern Germany and China are the speed with which market principles have been implemented, and the ownership of policies relating to the transition process. China has followed an approach of slow transformation and incremental changes over a longer period of time. Chinese administration and management consciously determined the speed and direction of the national transition process, with the role of foreigners being of limited importance. The transformation has been regarded as an opportunity by a large percentage of the population and particularly by managers who have seen their decision-making power and income perspectives grow. Managers see themselves as constructing a modern economy, and this positive thinking might increase their propensity to take risks in business.

Instead of initiating and maintaining change on its own, much of the eastern German population felt itself subject to a radical transformation which was brought about by an administration and management dominated by western Germans. Changes came quickly and from the outside. Privatization in most cases either meant a financial take-over by a western German company or liquidation after the evaluation of the firm's financial health by western German experts. Layoffs were common, and unemployment rose to unexpected levels. This sense of a lack of decision-making power may have had a paralyzing effect and thus have reduced the sensitivity to take risks.

While the Chinese may have developed a sensitivity for the opportunities of crisis situations through the autonomy of directing their own development, the eastern Germans have had no opportunity to do this. This could offer an explanation for the Chinese managers behaving more similarly to the western Germans in the crisis situation.

The history of the economic and political systems and the different transition paths seem to affect the risk sensitivity of managers in eastern Germany and China. Taking into account the finite speed of individual learning, risk-taking behavior may indeed lag behind the structural changes. Although we have not directly investigated how much each of these factors influences risk sensitivity, we believe that they could provide a good framework for explaining the outcome of our study. Nevertheless, there arises a demand for future research on this subject. Studies of other countries in transition, like Estonia and Poland, that have changed independently like China, but quickly like eastern Germany, would certainly offer an interesting enhancement to our findings as well.



In conclusion, the chosen line of reasoning in our study suggests that a few items could promote risk sensitivity as an important element of innovation for systems under transition.

Decentralization of decision power to the manager will enhance the self-responsibility and involvement in the innovation process. Incentives should accompany the decentralization and expose the managers to the risk of decision-making that is connected with innovation.

With respect to the more flexible and overt nature of young people, human resource strategies in companies should be rethought. For example, young managers should be promoted based on competence instead of seniority as they have spent less of their life in a pretransitional society. These aspects could help a company or cooperation project to manage a quick transformation into a capitalistoriented organization.

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