



IN-EAST
SCHOOL OF
ADVANCED
STUDIES

FEBRUARY 6-7, 2017

**CITY HALL DUISBURG
CAMPUS DUISBURG, ZBT/NETZ**

FINAL CONFERENCE

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FINAL CONFERENCE

INNOVATION IN EAST ASIA

ELECTROMOBILITY AND URBAN SYSTEMS

Monday, February 6, 2017

City Hall Duisburg, Burgplatz 19, 47049 Duisburg

Tuesday, February 7, 2017

ZBT and NETZ Building, Carl-Benz-Str. 201/199, 47057 Duisburg
University of Duisburg-Essen

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EDITORIAL

Dear reader,

We warmly welcome you to the Final Conference “Innovation in East Asia – Electromobility and Urban Systems” of the IN-EAST School of Advanced Studies (IN-EAST School). Let us jointly discuss pressing issues of innovation in our society and consider how the future of urban spaces and mobility can be designed.

The IN-EAST School was officially founded and began its work on April 1, 2013. The declared aim of the IN-EAST School was and is to make contributions in the following four areas:



Knowledge-oriented research:

To illuminate the theme of “innovation” from a disciplinary-based and area-specific perspective, with an emphasis on the fields of “urban systems” and “alternative drive systems (electric mobility)” in the East Asian region (China, Japan, South Korea). In order to meet the aspiration of area studies to reflect real world phenomena in their full complexity (or at least to approximate the latter), the IN-EAST School pursues an interdisciplinary approach. Interdisciplinarity is understood in such a way that disciplinary and subject-related findings on ‘innovation’ are also examined from the perspective of other disciplines and evaluated for their suitability for explaining real-world phenomena. The aim is to specify questions from the interplay of a multi and interdisciplinary approach and thus to gain “holistic” insights into the explanation of real phenomena that go beyond partial analytical results.

Discipline-based area studies:

To strengthen the link between area studies and systematic disciplines and to identify new ways for a mutually beneficial cross-fertilization. The IN-EAST School pursues the guiding principle that area-specific research must be anchored in systematic disciplines. On the other hand, the empirical application of theoretical concepts in the area can provide feedback on relevance and theoretical development. In order to strengthen this nexus, the IN-EAST School has placed a focus on “process tracing” in its political science work, and on the topos of “emergence” in the socio-oriented research fields. In its economic research agendas it is focussing on experimental approaches.

Innovative qualification models:

To explore new models of training new generations of area specialists. Good area studies research requires excellent area-specific skills (including language competence), excellent theoretical-methodical training in a systematic discipline, and the ability to reflect partial-analytical findings in an interdisciplinary manner. These competencies can only be acquired in a longer process, in which iteratively system-disciplinary and area-specific content are

focused on and combined. Through the establishment of research groups in which doctoral students, post-docs and professors work together on joint research interests, the IN-EAST School aims to provide an impulse for the formation of new qualification models suitable for the area studies.

Application orientation and broadening the basis of area studies:

To make the research findings obtained available to stakeholders in society, politics and business. With their focus on real phenomena, the regional studies have the opportunity to gain insights that in addition to the scientific examination and expansion of theoretical concepts have an immediate value for practical day-to-day issues. In order to unlock this potential the IN-EAST School has developed various formats with which it makes findings about "innovation" available to a non-academic audience (outreach) and acts as a contact partner and catalyst for researchers of all fields at the University of Duisburg-Essen. The IN-EAST School has also been committed to bringing the topic "East Asia" into the faculties of the University of Duisburg-Essen (inreach), thus bringing a corresponding rectorate declaration of November 2011 to life.

With its concluding conference "Innovation in East Asia – Electromobility and Urban Systems" the IN-EAST School intends to present a part of its results to a broader audience and bring to a close the first phase of its activities. We are very pleased and see it as proof of the excellent work of all the scientists and staff working at the IN-EAST School that the BMBF will continue to promote the IN-EAST School in a second phase. This gives us the opportunity to delve deeper into the issue of innovation and to generate new results for all participants in science, business, politics and society. This "concluding conference" is thus also a beginning, a beginning to the second phase of work of the IN-EAST School. To this end, we look forward to your suggestions and ideas to make the IN-EAST School even more successful.

We wish to thank everyone at the university, the cities of Duisburg and Essen as well as our partners in academia, business, politics and society who have supported us during the first four years so actively and have made it possible to provide this fruitful working environment in which the IN-EAST School has been able to thrive and develop.

With sincere regards,

A handwritten signature in black ink, appearing to read 'Markus Taube', is positioned above the printed name.

Markus Taube

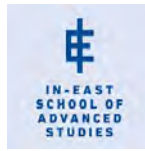
Director

IN-EAST School of Advanced Studies



CONFERENCE PROGRAM
Monday, February 6, 2017
City Hall, Burgplatz 19, 47049 Duisburg

15.30	Registration / Coffee / Tea
16.00	Introduction Markus Taube, <i>Director, IN-EAST School of Advanced Studies</i>
16.15	Keynote Speech Jörg Schönharting, <i>University of Duisburg-Essen</i> Challenges of Sustainable Mobility in Germany and China – Can We Learn from Each Other?
17.00	Welcome Sören Link, <i>Lord Mayor, City of Duisburg</i> Thomas Spitzley, <i>Vice-President, University of Duisburg-Essen</i>
17.15	Keynote Speech Takahiro Fujimoto, <i>University of Tokyo</i> An Architectural Analysis of Green Vehicles – Variety of Vehicle Types and Locations?
18.00–20.00	Reception



CONFERENCE PROGRAM

Tuesday, February 7, 2017

Venue: ZBT Building, Carl-Benz-Str. 201, 47057 Duisburg

- 9.00– 9.15 **Introduction**
 Markus Taube, *Director, IN-EAST School of Advanced Studies*
- 9.15– 9.35 **Reflections on Innovation**
 Marcus Conlé
- 9.35–10.20 **Behavioral Economics and East Asia**
 Timo Heinrich, Alexander Haering, Guanzhong Yang
- 10.20–11.05 **E-Mobility in Asia and Europe**
 Nicole Schleiffer, Mira Schüller
- 11.05–11.30 Coffee Break
- 11.30–12.15 **Urban Systems in East Asia**
 Beate Löffler, Katharina Borgmann, Deirdre Sneep
- 12.15–13.00 **Institutional Innovations in East Asian Energy and Low-Carbon Markets**
 Paul Scalise, Julia Aristova, Xiaoli Lin
- 13.00–14.00 Lunch
- 14.00–14.45 **Political Innovations in East Asian Cities**
 Momoyo Hüstebeck, Youngah Guahk, Weijing Le
- 14.45–15.30 **Innovation and the Chinese Economy**
 Shuanping Dai, Aleksandra Davydova, Yang Liu
- 15.30–16.00 Coffee Break
- 16.00–16.30 **Institutional Diversity, Organizational Development, and Innovation in China – The Example of Biopharmaceutical Industry**
 Marcus Conlé
- 16.30–17.00 **Concluding Session**

Venue: NETZ Building, Carl-Benz-Str. 199, 47057 Duisburg

- 17.15–18.30 **Metropolis: Visions of the City of the Future in Film and Media**
 Rolf Giesen, *Film Scholar and Journalist*
- 19.00 Conference Dinner

Please note that Wireless LAN is not available.

KEYNOTE SPEAKERS

Jörg Schönharting

Prof. em. Dr. techn. Jörg Schönharting (born 1941) studied civil engineering at the Technical Universities of Stuttgart and Aachen, graduate 1966, doctorate from the Technical University of Vienna (1970), 21 years consultant engineer, first in Vienna, then as a partner and managing director of Steierwald Schönharting und Partner GmbH (today SSP Consult Beratende Ingenieure GmbH), 1996 appointment as university professor at the University of Essen, head of the Institute of Transport and Traffic Engineering. In 2006 Prof. Schönharting retired and founded together with Dipl.-Ing. Stefan Wolter the TRC Transportation Research and Consulting GmbH, Stuttgart.



Prof. Schönharting is expert for traffic planning and traffic engineering. Special fields of interest are ecological aspects of infrastructure planning and operation (pollution, energy consumption, noise), traffic management by information and measures of sustainable mobility.

Prof. Schönharting is a member of the Chamber for Engineers in Baden-Württemberg (Ingenieurkammer), member of the Research Company for Roads and Transport (FGSV), and member of the German Transport Scientific Society (DVWG) and of the Centre for Logistics and Traffic at the University of Duisburg-Essen.

Takahiro Fujimoto

Takahiro (Taka) Fujimoto is Professor of Economics at the University of Tokyo and Executive Director of the Manufacturing Management Research Center (MMRC). Presently he is Research Fellow at the Lyon Collegium, Institute for Advanced Studies (November 1, 2016 – March 31, 2017), on a sabbatical leave from the University of Tokyo. He is also Faculty Fellow of Research Institute of Economy, Trade and Industry, and Senior Research Associate at Harvard Business School. He specializes in technology and operations management.



Takahiro Fujimoto graduated from Tokyo University and joined Mitsubishi Research Institute in 1979. He received his doctoral degree from Harvard Business School in 1989. Takahiro Fujimoto's main publications in English include: *Competing to Be Really, REALLY Good* (2007), *The Evolution of a Manufacturing System at Toyota* (1999), and *Product Development Performance: Strategy, Organization, and Management in the World Auto Industry* (1991) with Kim B. Clark.

METROPOLIS

Rolf Giesen

Born on July 4, 1953. Rolf Giesen received his Doctor of Philosophy in 1979 from the Freie Universität Berlin. He was in charge of the “Ray Harryhausen” collection as well as the “Special Effects/Animation” collection at Deutsche Kinemathek for 20 years. His work includes film exhibitions, journalistic work and approximately 50 books on a variety of film-related topics: visual effects (VFX), animation, fantasy and science fiction film, National Socialist films. Rolf Giesen has been an advisor and SFX-supervisor, dramaturg and co-author, involved in movies and film series. He was honorary professor at the German Film School for digital production.



Rolf Giesen is an expert on China. In 2007 and 2009, he was guest professor at the Animation School (CUC Anima) of the Communication University of China in Beijing. Until 2012 he was president of the Jilin International Animation and Comics Museum at the Jilin Animation Institute in Changchun.

Geboren am 4. Juli 1953 in Moers. Studium an der Freien Universität Berlin, 1979 Dr. phil. Betreute innerhalb der Deutschen Kinemathek fast 20 Jahre lang die Sammlungen „Ray Harryhausen“ und „Special Effects/Animation“. Filmausstellungen, journalistische Arbeit und annähernd 50 Bücher zu allen Themen des Films: VFX, Animation, Phantastischer und SF-Film, NS-Film. Als Berater, VFX-Supervisor, Dramaturg, Co-Autor an Kinofilmen und Serien beteiligt. Honorarprofessor an der German Film School for digital production.

Rolf Giesen ist China-Kenner. 2007 und 2009 Gastprofessor an der Animation School (CUC Anima) der Communication University of China in Beijing sowie bis 2012 Präsident des Jilin International Animation and Comics Museum am Jilin Animation Institute in Changchun, dem Zentrum der alten Mandschurei.



RESEARCH POSTERS

The scholars of the IN-EAST School of Advanced Studies are going to present their research results on large research posters on Tuesday, February 7, 2017 at ZBT Building.

The posters and the presentations are intellectual property of the scholars of the IN-EAST School of Advanced Studies; copyright by the authors.

CHINA'S NATIONAL SYSTEMS OF INNOVATION POLICIES: BEYOND THE 2006 AGENDA

Introduction

Thanks to the expansion of communication scale and the increasing interdependences of the global markets, the construction and functioning of innovation policies should reflect the differences of the existing systems historically and/or geographically. This paper reviews 48 China's innovation policies published at the national level (i.e. State Council) since the transformation in 2006, and takes a close look at how the innovation policies evolve systematically, and how the central government gradually establishes and improves China's national innovation system.

A Framework of National Systems of Innovation Policies

We suggest a framework for innovation policies that comprises the following groups of policies:

- Policy I that focuses on specific areas of science and technology,
- Policy II that provides conditions for the innovation activities, and
- Policy III that helps actors, in particular innovators, to have common cognition of Policies I and II, and coordinates actor's understanding on Policies I and II.

China's Innovation Policies since 2006

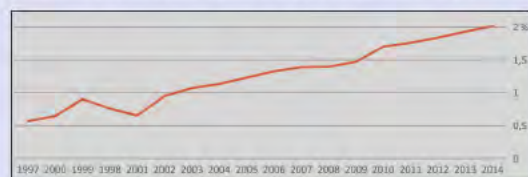
- Policy I is widely presented on the Chinese government agenda in the period from 2005 to 2015.
- Chinese government is putting effort into creating favorable institutional settings for innovation and to ensure the success of Policy I measures by boosting the competitive environment, providing adequate human capital, and promoting high-tech industrialization and entrepreneurship.
- The State Council has established a system of joint inter-ministerial meetings to coordinate the information exchanged among regions, departments and firms; and implemented fundamental policies to create an innovation-friendly environment.



Industry Robot



Five-hundred-meter Aperture Spherical Telescope (FAST)



The Share of R&D in GDP in China

Towards Systemic Innovation

- China's National Innovation System has been enforced significantly through series of policies.
- Open and shared innovation has been a major concern for China over the past ten years.
- The concept of "mass entrepreneurship and innovation" (MEI) will lead China to be an innovative economy.
- Chinese government may reform its governance approaches and correspondingly improve administration skills for innovation.



CROSS-BORDER M&A AND INNOVATION: EXPLORING THE KNOWLEDGE PERSPECTIVE MANAGING POST-DEAL INTEGRATION FOR SUCCESS. INSIGHTS FROM CHINESE ACQUIRERS

Research Focus

- Knowledge transfer and combination after cross-border M&A by Chinese companies as a way to improve innovation capabilities of the acquirers.

Terminological Foundations

- Innovation – the implementation of a new significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (Schumpeter 1934);
- The creation of knowledge is a source for continuous innovation (Nonaka and Takeuchi 1995);
- New internal and external knowledge and its combination with the existing stock has the potential to upgrade innovation capabilities of a firm (Teece 2014).

Theoretical Motivation

- Limited amount of studies on the connection between M&A and innovation; mixed results of tests of which theoretical hypotheses fit the data; partial and difficult to generalize results of empirical studies;
- M&A are particularly interesting for knowledge transfer research because they imply both inter- and intra-firm aspects of knowledge transfer.

Empirical Motivation

- Puzzle: M&A have a unique potential to renew and upgrade a company's knowledge base. In practice, knowledge acquisition is one of the key driving forces for companies behind M&A. Nevertheless, knowledge renewal and upgrade by means of M&A often falls short of expectations;
- Unique context of Chinese outward cross-border M&A.



Case Study:
Lenovo Acquisition of Motorola

References:

- Nonaka, I. & Takeuchi, H. (1995): *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York, NY: Oxford University Press
- Schumpeter, J. A. (1934): *The Theory of Economic Development*. Cambridge, MA: Harvard University Press
- Teece, D. J. (2014): *The Foundations of Enterprise Performance: Dynamic and Ordinary Capabilities in an (Economic) Theory of Firms*. In: *The Academy of Management Perspectives*, 28(4), 328–352

Research Description

Research Question

How should companies manage their post-deal integration in order to enable knowledge transfer and recombination in the case of cross-border M&A?

Research Foundations

Knowledge-Based View
Network Approach

Research Method

Case study analysis based on secondary data and expert interviews

Research Conclusions

- From the knowledge perspective, cross-border M&A is one of the possible strategic tools to develop innovation capabilities of the companies. They allow for a quick access to socially and institutionally embedded knowledge assets and offer ownership and control advantages.
- Knowledge should be mutually transferred and recombined to allow for new knowledge creation and innovation capabilities' development after cross-border M&A.
- The process of knowledge transfer is affected by the conditioning factors. The more companies monitor the factors and adjust their integration accordingly, the higher is the probability that knowledge transfer and combination take place.
- Small-world network cooperation patterns of the post-deal entity facilitate knowledge transfer and combination. The more the new entity's cooperation patterns reflect small-world networks, the higher is the probability that knowledge transfer and combination take place.

Contribution

- Contribution to the research on connection between cross-border M&A, knowledge transfer and integration strategy by in-depth study of particular Chinese cases
- Contribution to the theory by establishing the link between network approach and strategy and management studies of post-M&A integration for knowledge transfer



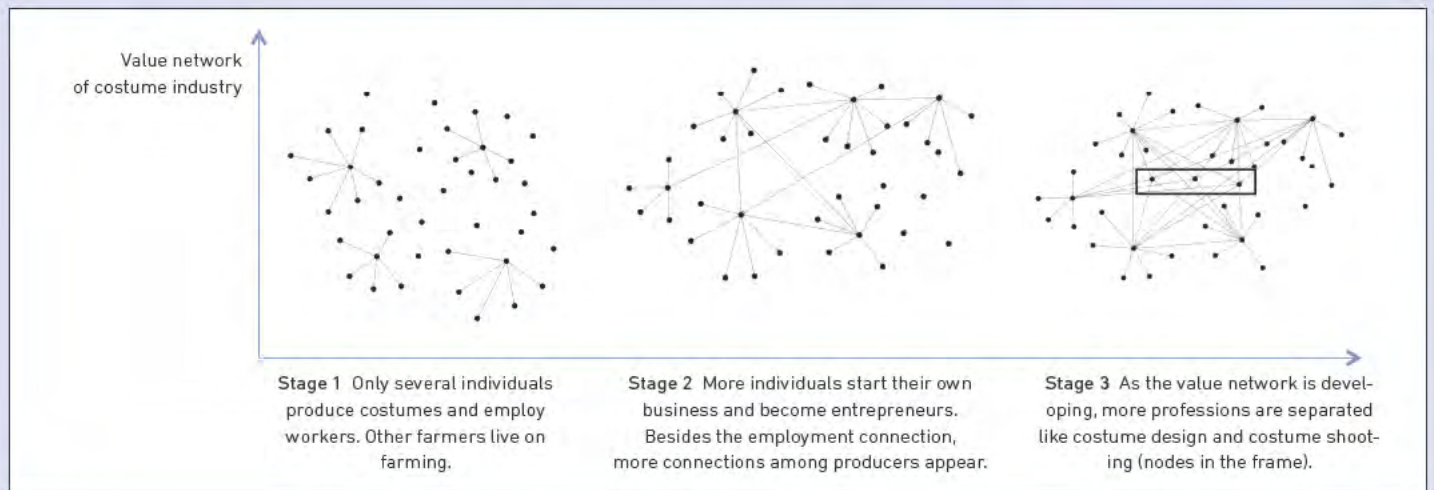
ENTREPRENEURSHIP AND POVERTY ALLEVIATION IN CHINA: A NETWORK PERSPECTIVE

Introduction

This project tries to answer how entrepreneurship helps to alleviate poverty. Entrepreneurs undertake new ideas and new combinations in value creation and distribution which affects individuals' income and welfare status through changing the way of value exchange and realization among them. To show the process of value creation and distribution, we combine the method of network analysis, and the idea of value network with a case in Cao County in Shandong Province, China.

The Growth of One Value Network of Costume Production and Trade in Cao County

This project has done one case study in a town in Cao County. The town was poor before 2009 and most farmers earned their living on farming. Several farmers started to open online shops selling and making costumes since 2009. These entrepreneurs organized the first small value network of costume production and trade. As this costume industry value network was developing, more and more farmers were learning by doing in the value network and became entrepreneurs, and the local values were densely interconnected. Along with this process, the structure of the value network has changed and the mechanism of its change shows the key to how entrepreneurship helps alleviate poverty and improve participants' living standard. The following figure shows this process in general.



Conclusion

The poor in the town escaped from poverty by creating a new value network through exploiting opportunity on the Internet and joining the value network.

The value network becomes more dense and complex as more individuals join and start their own business through learning.

The value network becomes stable and shows more heterogeneous nodes when the level of division of labor becomes high.

Contribution

This project is a recall of scholar's call for analysis of the process of poverty alleviation through entrepreneurship from a more theoretical perspective.

This project tries a new methodological perspective, i.e. value network, to explain the process of entrepreneurship's effects on poverty alleviation.



INNOVATION IN DEMOCRATIC PRACTICE – A JAPANESE AND GERMAN COMPARISON

Empirical Background

Democracy is fluid. Social, political and economic changes have transformed the content of democracy over time. Even for consolidated democracies such as Germany and Japan the pursuance of democratic quality (political equality, transparency, accountability) is a continual challenge. Classic political participation such as going to the polls or a party membership has been declined in representative democracies. Hence, polity must respond to the new needs with innovative measures beyond the usual path.

Current Research

Declining voter turnouts have intensified discussions in academia and polity of reforming the democratic practice. Inventions beyond the ballots shall counteract the lack of legitimacy and offer a political asset to solve the democratic malaise which representative democracies have suffered since the last decade. Democratic innovations are conceived to strengthen citizen participation and deliberation. Common samples are participatory budgeting, citizen assemblies or e-democracy.

Method and Research Question

Democratic innovations are explored in this project with a Japanese-German comparative approach. Germany and Japan are alike in their tight restriction on direct democracy. Due to parallel historical experiences of extremist regimes direct democracy in both countries is limited to the sub-national entities. However, the demand for a direct say has increased since severe protests in the 1960s and deliberative collaborations between citizens and local governments since the 1990s.

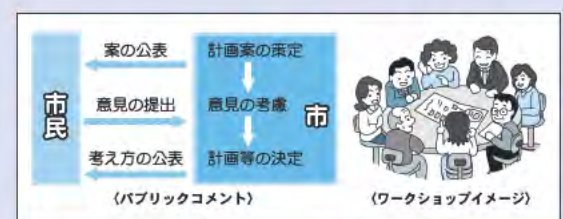
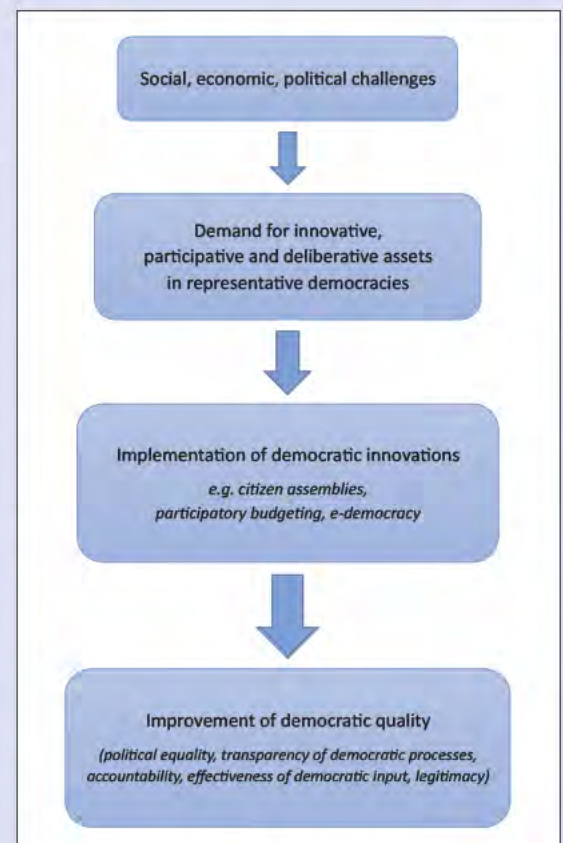
The particular interest of the project lies in the impact of democratic innovations on the political culture and the power-balance between state and citizens in both countries. It is empirically scrutinized, whether innovative participatory procedures have the potential to diffuse widely and pervade politics. Based on the empirical study it is examined to what extent democratic innovations have strengthened entirely both democracies.

Hypothesis

Democratic innovations

- Offer opportunities for citizens to influence institutional decision-making (democratic-input)
- Encourage individual issue knowledge, civic skills and public activities (civic education)
- Lead to rational decisions based on public deliberation (transparency/accountability)
- Increase the legitimacy of political decisions

However, democratic innovations have a minor impact on the quality of the whole democracy as long as the positive effects are limited to the small number of participants.



<https://www.city.komae.tokyo.jp/images/content/57584/20130809-170051.jpg>



THE POLITICS AND PROCESSES OF CREATING ECO-CITIES IN SOUTH KOREA

Background

Nowadays, more than half of the total population in the world is living in the cities and these numbers will continue to increase rapidly in the future. For that reason, innovative cities are seen to be essential in order to address challenges such as urbanisation, explorative migration and sustainable growth. A more specific dimension of the trend to link urbanization problems, sustainable development and innovation in East Asia has been the creation of 'eco-cities'. Traditionally, South Korea has been char-

acterised by a high degree of centralised government and the key policy decisions are generally taken by central government and imposed top-down on the local level. However, to some extent, the creation of eco-cities in South Korea can be seen as a sign of political innovation, putting greater emphasis on bottom-up processes of citizen involvement and local self-government. For this reason, this research project studies the political process of the creation of eco-cities as an example of political innovation in East Asia.

Research Question

What are the essential aspects of the political process that leads to political innovation through the creation of eco-cities?

Theoretical Framework & Methodological Approaches

The thesis applies the Historical Institutionalism, conceptualising the creation of eco-cities in South Korea as a critical juncture in urban governance that constitutes an example of political innovation. Research is operationalized through a comparative case study, tracing the process of eco-city development in two local government districts – the self-governing province of Jeju and the city of Suwon – involving document research, in-depth interviews and participant observation.

Case Studies

Jeju Self-Governing Province

- Upper-tiered local government
- Popular tourist destination
- Environmental Hub project in 2010



Suwon City

- Lower-tiered local government
- Industrial city
- Environmental capital project in 2011

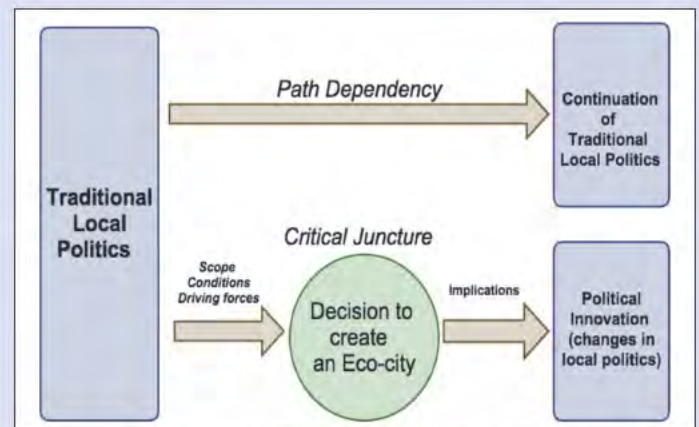


Diagram: Conceptualising the Process of Creating an Eco-city

Findings

1. The eco-city transformation process began when environmental problems raised societal awareness about these issues at the local level.
2. Environmental NGOs politicized local environmental issues (including at local elections) and mobilized local society to become involved in decision-making about these problems.
3. Local leaders encouraged greater societal involvement and facilitated changing local government attitudes towards environmental sustainability.
4. Local governments make use of the opportunities provided by central government which still provides the overall legal framework and financial support for the transformation of the eco city on the local level.
5. The success of an eco-city transformation depends on opportunities provided by central government, initiatives taken by local leaders and changing societal attitudes to environmental sustainability.



THE PURSUIT OF CREATIVE INTELLIGENCE – POLICY INNOVATION FOR CHINA'S HIGHER EDUCATION TEST AND ADMISSION SYSTEM

Research Background and Research Questions

The research project deals with the policy innovation in the Chinese higher education test and admission system, which aims to establish a more effective and efficient selection system to recruit qualified university students to fulfill the labor demand for further economic development goals. The study answers two questions:

- How is the policy innovation driven and made in the Chinese authoritarian political system?
- What factors impact the bureaucratic actions in the implementation of the policy innovation in the higher education system?

Process-tracing Method and Observation Unit

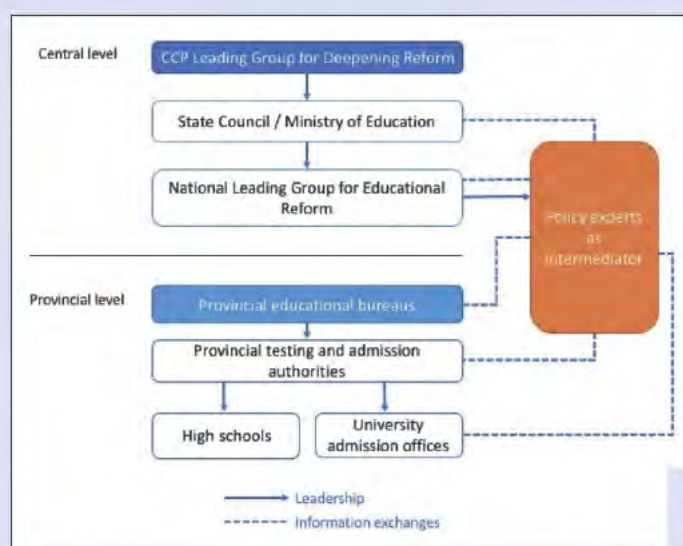
As implied in the research questions, I label the observation unit of the study as the process "from intention to actions" (see details in the graph below). Thus, the dissertation applies the methods of process tracing, which views the investigated process as an integrated unit without dividing it into sequential policy stages. The causal links between intention to actions are analyzed based on the in-depth interviews with educational bureaucrats, university admission offices, high school students and teachers. Government policies and statistics were collected during the fieldwork to assist the explanation.



Empirical Results

The graph below illustrates the central-provincial interactions of the educational bureaucracy in the process of policy innovation. The empirical data reveal that the policy innovation was initiated by the central government which perceived the labor shortage as a potential crisis for the economic growth. Policy experts functioned as the intermediary between the central and local level in the formulation of policy intention. Communication channels were established through frequent engagement of the experts so that both administrative levels received multidimensional information for decision making.

The interview data also indicate that the implementing actions of the educational officials are influenced by the institutionalized power relationships in the educational bureaucratic system. The value perception of higher education and admission is another factor that impacts the decision making of the bureaucrats. The interplay of the two factors determines the actual implementing strategies taken by the provincial educational bureaus.

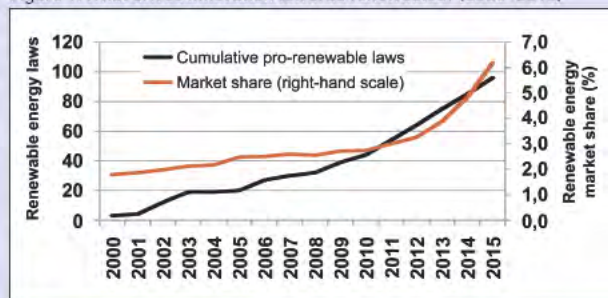


TECHNOLOGICAL AND POLITICAL INNOVATIONS IN JAPAN'S RENEWABLE ENERGY MARKET: EXPLORING THE DRIVERS OF INSTITUTIONAL CHANGE

Research Background

Despite protests from defenders of the status quo, pro-renewable energy legislation passed in Japan's Parliament since 2000. Accompanying these changes, an accelerated number of new entrants in the liberalized electricity market have successfully captured market share with renewable energy sources since the Fukushima nuclear crisis and have brought technological innovation to Japan's energy market (Figure 1).

Figure 1: What drives innovation towards renewables? (2000–2015)



Puzzle

How did a poorly organized and poorly funded "green" movement with limited support and few political links to government achieve such favorable legislation in the face of vocal opposition from the defenders of the pre-Fukushima nuclear disaster's status quo?

Null Hypothesis

Self-interest matters. The conventional wisdom of regulatory activity is the so-called 'economic theory', which posits:

- Economic actors are rational and material maximizers;
- Politicians and regulators are career conscious and susceptible to highly organized, asset-rich vested interests of the status quo looking for protection from competition and profit deterioration.

Rival Hypothesis

Image matters. Provided that the original understanding and framing of a policy is slowly undermined by a different understanding and framework in various policy venues (e.g., mass media, legislature, and advisory committees), an exogenous shock to the system can lead to a policy monopoly collapse.

Findings

Extensive analysis of resource endowments (e.g., cash contributions to political parties, business assets, membership) and their corresponding case studies in the Japanese energy sector have shown little correlation with policy outcomes, despite clear preferences by actors (Table 1). Rather than money "buying" policy, other factors may be more fundamental to the process of institutional change.

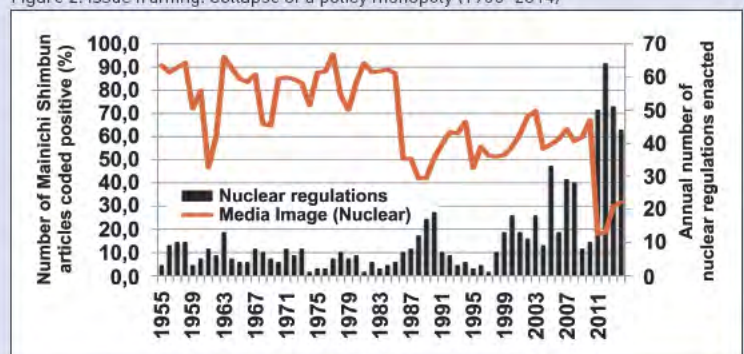
Table 1: The richer do not always prevail

Type of Resource	Percentage of issues where the side with greater control of this resource gained its preferred outcome	Number of issues
High-level government allies	75	23
Business assets	25	27
Revenues	25	27
Operating profit	25	26
Membership	5	25
Lobbying expenditures	10	29
Campaign contributions	12	29

Analysis of multiple cases in the energy sector showed that:

1. Political attention is constrained by a finite number of policies at any given time because of limited time, energy, and resources.
2. There is a correlation, albeit loose, between changes in a policy's image and increased regulatory activity (Figure 2).
3. Legislative hearings and ministerial advisory council proceedings increase with a deterioration in a policy's image in the energy sector.

Figure 2: Issue framing: Collapse of a policy monopoly (1955–2014)



EMERGING TECHNOLOGIES: DRIVERS FOR GEOTHERMAL HEAT PUMPS (GHP) USE IN CHINA

Introduction: What are GHPs?

Inspired by China's 11th Five-Year Plan (2006–2011), which calls for energy efficiency, reduction of carbon emissions and development of renewable energy sources, Chinese local governments hit the road towards a low-carbon future. In 2007, Shenyang city invested 20 billion Yuan (1.9 billion Euro) in 188 GHP projects, by far surpassing the former leader in GHP application: Beijing.

GHP is a highly efficient technology for space heating (Figure 1). It relies on various ground sources for heat extraction, including well, ground water and surface water. GHP operates by electricity and produces zero carbon emissions.

Puzzle

Why did geothermal heat pump implementation show exponential growth in Shenyang in the late 2000s relative to the modest growth trend in Beijing (Figure 2) despite similar GDP per capita levels (standards of living) in both regions, similar air pollution and carbon dioxide emission issues, similar cold weather patterns in winter, and initially expressed interest in GHP technology by both local governments?

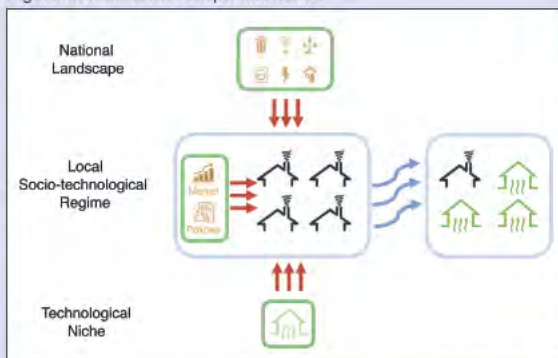
Null Hypothesis

Intensive implementation of GHP in Shenyang was driven by better natural conditions and economic benefit than in Beijing.

Hypothesis

The Shenyang municipal government encouraged implementation of GHPs through supportive policies and subsidies more than in Beijing due to differences in policy priorities, local political culture, governors' city development vision.

Figure 3: Multi-level Perspective (MLP)



Source: Frank W. Geels (2002): Technological Transitions as Evolutionary Reconfiguration Processes

Figure 1: Operation of Geothermal Heat Pump System

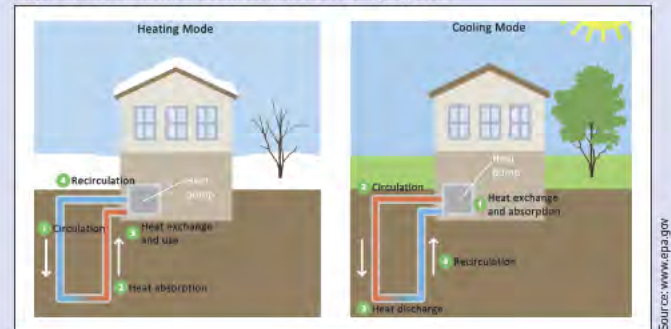
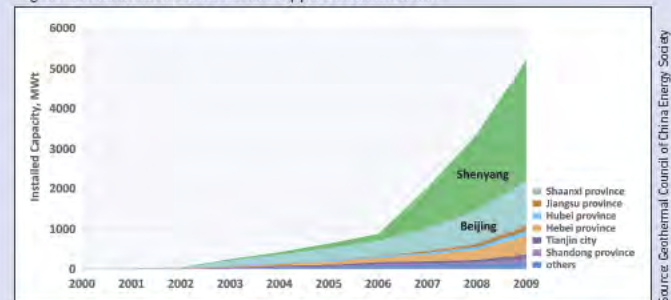


Figure 2: Annual Growth of GHP Application in China



Findings

Multi-level perspective (MLP) provides a framework to analyze factors driving rollout of technological innovation in society (Figure 3). MLP describes application of a new technology as a socio-technical transition driven by a set of technological, political and social factors, including technology advancement, sectoral policies, market, industrial networks, user practices, symbolic meaning, etc.

Analysis of government documents and reports and interviews conducted with government representatives, academics, businessmen and experts in the field showed that

1. Judging by natural conditions, Beijing is more suitable for wide-spread and efficient GHP implementation.
2. Costs for heating provided by GHP are equal in Beijing and Shenyang.
3. Due to the city's historical background and political status, the Shenyang local government is more prone to risk-taking, i.e. ready to potential failure in the process of innovation. By comparison, Beijing with its high profile prefers more conventional solutions such as gas heating and air source heat pumps.
4. Due to educational and professional background, Shenyang's governors had strong personal belief in GHP potential and benefit.



CHINESE CITIES' BUILT-UP ENVIRONMENT'S IMPACTS ON THE ACCESSIBILITY LEVEL OF MOBILITY ALTERNATIVES – INNOVATION IN 'NEIGHBORHOOD TYPOLOGY' APPROACHES

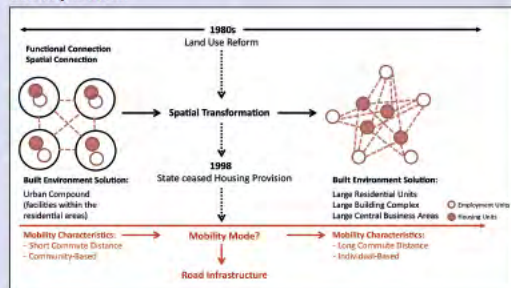
Research Background

Chinese cities are undergoing rapid urbanization and motorization process, one of the challenges for the municipalities is to manage the rapid growth of motorization. The Chinese cities' urban built-up environment is transforming into an *Automobile-Dependent Spatial Structure* (ADSS) after the State has introduced the *land use reform policy* in the 1980s. This is one of the key elements in stimulating the rapid motorization development in Chinese cities.

In order to understand how ADSS influenced different mobility alternatives in the Chinese context, this research applies spatial pattern analysis tools to measure the characteristics of the Chinese cities' urban built-up environment – *neighborhood typology*. One of the key measurements is to compare the accessibility level between Public Transport Alternatives (includes Metro, Bus, Public Bikes) and automobiles. Therefore, the empirical data are focusing on collecting real walking distances from home units to Public Transport Alternatives (PTA) and to Private Vehicles (PV). In the case study city Shenzhen, data have shown that the average accessing distance of PTA is longer than PV. These are the consequences of different urban planning systems which include land use planning system, municipal road infrastructure system and architecture system (real estate housing sector).

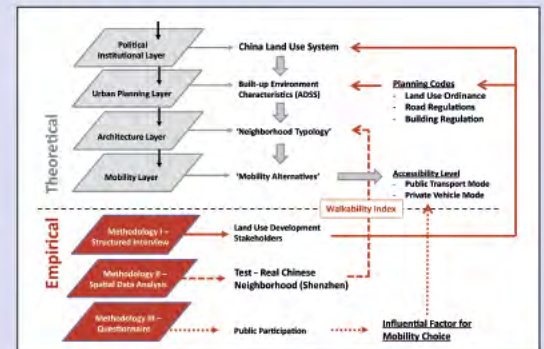
The ADSS development trend in the Chinese cities has enhanced the mobility pattern of private vehicles mode rather than public transport modes, this trend has lead to the high carbon future in the transport sector for Chinese cities. In order to shift the ADSS trend into a Transit-Oriented Spatial Structure (TOSS) that could guide the city development into

Chinese Cities' Spatial Transformation Process and Impacts on the Mobility Pattern



a low carbon future, there are needs for innovations which should focus on reviewing the key urban planning systems in the Chinese cities' urban planning structures as well as their spatial interactions. Especially those key urban planning systems have shifted the *neighborhood typology* into an ADSS development.

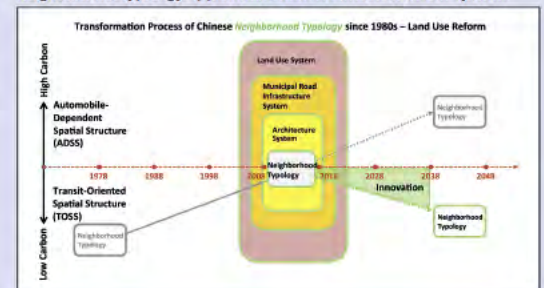
Research Framework



Research Questions

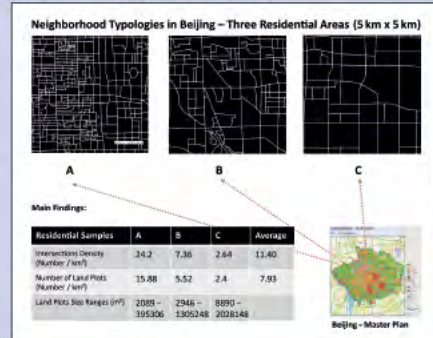
1. How Chinese Urban Land Policy Reform (1980s) has changed Chinese cities' urban built-up environment towards an *Automobile-Dependent Spatial Structure* (ADSS)
2. How did an ADSS influence residence's accessibility level to different mobility modes in the Chinese contexts?

Innovation for Low-Carbon Transport Mode Development – Neighborhood Typology approaches and the involved urban system

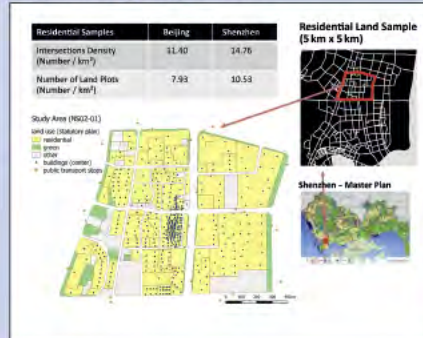


Research Results (Intermediate)

Neighborhood Typologies in Beijing



Neighborhood Typology in Shenzhen



Samples – Accessing Distance to Bus Stops



EXOTICISM CONSTRUCTED

THE WRITINGS ON JAPANESE ARCHITECTURE AS A CULTURAL NEGOTIATION OF KNOWLEDGE



Background

The narratives of modern societies understand innovation as a necessary means to purposefully advance human existence. Innovation projects are hence shaped by the general understanding of progress within the respective society. They are shaped as well by the culture's (popular) knowledge systems that provide factual knowledge and references for relevance, parameters and aims of innovative intervention for the involved decision makers. In consequence, the successful development and implementation of innovations in our societies depends not only on the society's creativity and volition but on the validity of the information classified in knowledge systems.

Research Project

There is evidence that today's popular and academic knowledge systems may unintentionally perpetuate colonial worldviews due to historical path dependencies and thus hinder the successful evaluation and implementation of innovative action. In order to verify this, my current research project analyses the establishment of a specific body of knowledge within the system of general knowledge and modern academia. As a case study, it traces the collection, evaluation, and dissemination of knowledge regarding Japanese architecture in the West from 1850 onwards and analyses the actors, topics, discourses, and media involved. I aim to understand the development and institutionalisation of specialist knowledge in particular and of knowledge systems in general.

Results

For the latter half of the nineteenth century, the research shows a shift from the ideals of a timeless validity of architectural and formal order alone towards two dichotomous concepts. It emerged into a juxtaposition of the established, traditional perspective on one hand and ideas of design and planning as progressive practises in favour of an advancement of human civilisation on the other hand. Since then, the key concepts of 'tradition' and 'modernity' are cornerstones in the constant re-negotiation of the prerogative of interpretation that shape the discourses on social development, urban planning and architectural design.

In addition, the research shows that this balanced discourse was not extended to include non-western cultural traditions. Japanese architecture was perceived as unfit for improvement and thus irrelevant for European advancement. It was but looked at as an expression of a foreign culture, the exotic Other. In regard to the pending analysis of further writings from later decades, I assume that this notion of otherness became deeply embedded in both academia and general knowledge and was rarely questioned again. Even when the modernist architects re-discovered traditional Japanese architecture during the late 1920s, they added some new perspectives but did not question the fundamental understanding of Japan's cultural otherness. Since this school of thought succeeded to dominate social discourses in relation to architecture and urban development during the latter half of the twentieth century, this helped to canonize the exotic Japanese-ness of Japanese architecture even further both within and outside of academia. This otherness was even attributed to decidedly modern Japanese architecture over time.

The research points to the conclusion that most of today's evaluations of Japanese architecture – and for that matter Japanese cities – still include the concept of a 'traditional' Japanese otherness and thus basically permeate a nineteenth century's conception of the world's cultures and their respective capacity for social and technological progress.

Historical Sources of Architectural Knowledge



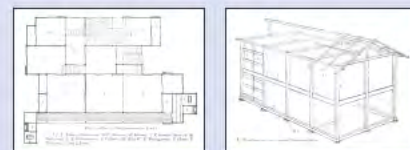
Artefacts (in situ or translocated into museum collections)



Models



Postcards, photographs, and films



Technical drawings

Panorama above: Panorama of Edo by Felice Beato, 1865/66 (public domain)
 Artefacts: Buildings in Meiji-Mura: Entrance and Lobby of the Imperial Hotel, Tokyo, 1922–1927 by Frank L. Wright / Azuma-yu, Handa, 1910 (BL)
 Models: Bauernhaus, 1872, Weltmuseum Wien / Deshima, Nagasaki (BL)
 Postcards, Photographs, and Films: Postcard of Kameido Tenmangu Shrine, [1918–1933] / Satsuma Pavilion at Paris World Fair, 1867 (public domain)
 Technical drawings: Morse, Edward S.: Japanese homes and their surroundings, 1886, p. 116
 Panorama below: Panorama of the Foreign Settlement in Yokohama, Kusakabe Kimbei, [1863–1870] (public domain)



CITIES IN CHINA: LOCAL CONTEXT VERSUS GLOBAL CONCEPTS DECODING THE BUILT ENVIRONMENT TO UNDERSTAND THE PHYSICAL MANIFESTATIONS OF THE CHINESE CULTURE

Research Background

The architectural and urban cultural environment people grow up in fundamentally shapes their perception of space and the narratives they use to describe it. Due to being influenced by certain types of spaces, we develop cognitive biases, which form our perception of foreign spaces in particular ways. The European urban experience equips the observer with a set of skills and expectations, which might not be sufficient to understand a city that is located outside of the familiar European patterns occurrence area. This universal phenomenon is increasingly relevant in a globalized world where business entities, as well as experts, concepts, and ideas travel across cultural borders, nations, and continents to engage with urban spatial environments.

Research Description

This dissertation project aims at breaking down the complexity of the fast-growing Chinese cities for a non-Chinese audience in order to contribute to a culturally sustainable understanding of Chinese cities. This is done based on the urban hermeneutics approach of analysing urban textures and patterns, recurring city components, such as railway stations, city halls, CBDs (Fig. 1, 2, 3, 4), in seven selected cities with the tools of urban and architectural decoding, as well as expert interviews. On the disciplinary background of architecture and city building, it is the aim to discuss the Chinese physical environment by looking at it within its multiple contexts, such as philosophical, cultural, political, economic, or historical, in order to better understand its specificity, the *Chinese-ness* within the rapidly growing built environment (Fig. 5, 6) and its distinct differences from Western cities (European or American).



Figure 1: Shenzhen, city hall

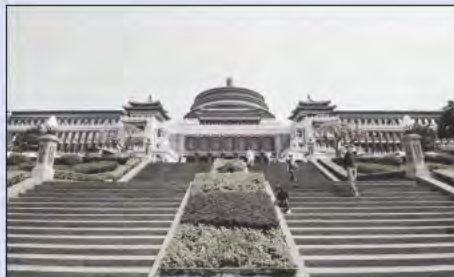


Figure 3: Chongqing, city hall



Figure 5: Wuhan, Wuchang; old riverside neighbourhood



Figure 2: Beijing, railway station west



Figure 4: Wuhan, Hankou railway station



Figure 6: Wuhan, Wuchang; transformation of old riverside neighbourhood

Research Results

Despite the globalized world, the local characteristics, patterns, and codes remain a reflection of the cultural imbeddedness and the foundation for growing and quickly evolving cities. The specifically Chinese codes found in the built environment of the cities in China reflect the local traditions and history as much as the recent rapid development (technologically, economical, and culturally) of the past few decades.

Research Outlook

This research strives to provide practitioners and researchers alike with a broader toolset to 'read', 'decode', and therefore better understand the urban physical environment in Chinese cities. The overarching aim of the project is to be able to support the process of creating ecological, technological, and cultural sustainable future cities in an increasingly challenging and complex environment.



CELL PHONE CITY: TOKYO'S VIRTUALIZATION OF SPACE DUE TO MOBILE COMMUNICATION INNOVATION

Background

Cities all over the world are rapidly changing due to a mobile communication technology innovation. All around us, screens are getting bigger and Internet is getting faster. Although the growth of mobile Internet is a global phenomenon, there are several urban agglomerations in East-Asian countries that rank particularly high in mobile Internet data consumption. Among those is Tokyo, the cradle of mobile Internet technology, where people use their mobile phones anywhere they go, carrying pocket routers that make sure their Internet connection is strong, fast, and unlimited. Changes like this are bound to have large impact on how people experience urban space, because it blurs the boundaries between physical and virtual space. The constant connectedness transforms streets into places for diverse social interaction; buses into workspaces; and crossroads into arcade halls. QR codes and URLs scattered on the street prompt the mobile phone user to visit specific places online. This research project looks at the impact the digitalization of urban space due to mobile Internet has on the way people interact with urban space around them.

Data Collection and Analysis

Participant observation and behavioral mapping with the aid of action camera footage in Shinjuku, the heart of Tokyo, shows clearly the essential role mobile Internet has taken in the everyday life of those living in the city. A significant number of people uses mobile phones while in public, often staring at the screen rather than at their feet. Specific places, such as train stations and pedestrian crossings, have a particular high number of people using their mobile device actively, while some other spaces, such as residential areas, have very little mobile Internet activity. Mobile phone use also seemed to be related to the type of district that the mobile phone user was located in: the business district had more people using their phones while walking, and entertainment districts saw a surge in voice calls. An example: in Image 6 we see how pedestrians in Shinjuku Sanchōme (shopping district) use their mobile phones. Compared to the other districts, Shinjuku Sanchōme showed a high percentage of people using their mobile phones quite intensively.



Image 1: Smartphone users on Shibuya Scramble: a still from NTT DoCoMo's awareness video for the dangers of using smartphone while walking



Image 2: An actual photograph of smartphone users on Shibuya Scramble



Image 3: Smartphone users in Shinjuku

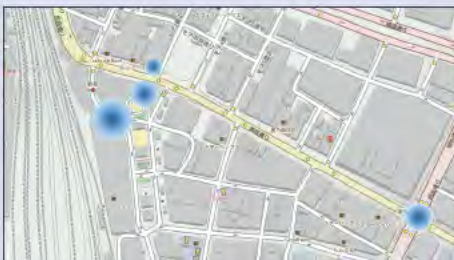


Image 4: Map indicating the places that have the most smartphone use in Shinjuku Sanchōme

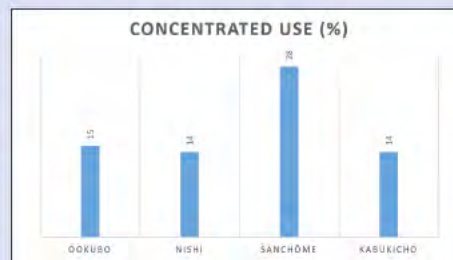


Image 5: Graph showing the percentage of concentrated smartphone use in different districts in Shinjuku

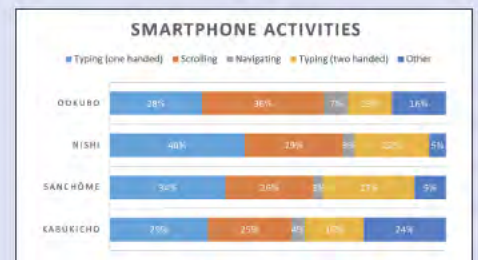


Image 6: Graph showing the percentage of mobile phone activities per district in Shinjuku

Results

The mobile phone has become an essential device for the modern city dweller. This study showed that a significant number of pedestrians in the Shinjuku area in Tokyo used their phone when participating in traffic. The kind of mobile phone use seems to be related to the kind of environment the user is in, implying that physical space has influence on virtual space behavior, and vice versa.

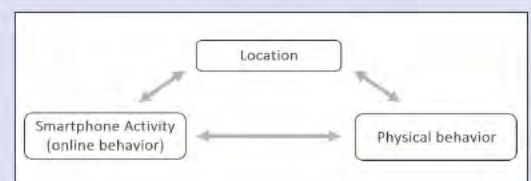


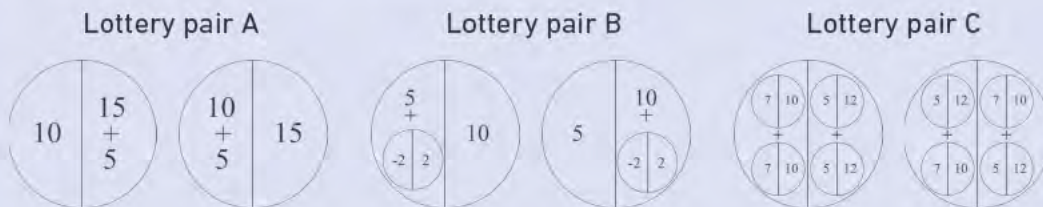
Image 7: The correlation between physical and virtual space, and pedestrian's behavior



EXPLORING THE CONSISTENCY OF HIGHER-ORDER RISK PREFERENCES

Creating **innovations** is risky: They result from trying new things with potentially large but highly uncertain rewards. Generally, all people like **higher mean** monetary payoffs and many (but not all) prefer a **smaller variance** in uncertain payoffs (they are “risk-averse”). However, these are only two of many attributes that can characterize a probability distribution over payoffs. **Skewness**, for example, describes the asymmetry of a distribution.

The shapes of payoff distributions determine innovative behavior: For example, Berkhout et al. (2015, *Entrepreneurship Theory and Practice*) observe that the lower **skewness** of entry-level wages in a given sector the more graduates choose **entrepreneurship** over employment. When it comes to extreme but unlikely payoffs, they prefer high to low payoffs.

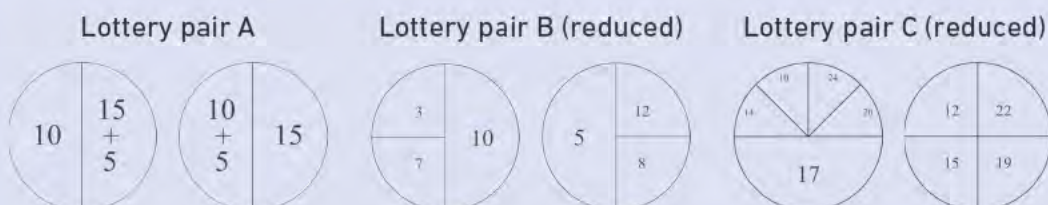


Deck & Schlesinger (2014, *Econometrica*) discover that while many people dislike **variance** (are risk-averse) *even more* like **skewness** (are prudent).

They observe a consistent pattern of behavior that also describes preferences over other properties of payoff distributions: For example, those who choose left in lottery pair A above also choose left in C and those who choose right in A also choose right in C. However, *all* chose right in lottery pair B.

In our experimental study we replicate the findings by Deck & Schlesinger in the USA and discover a similar pattern in **China** and in **Germany**.

In China we also observe that the pattern is robust to a tenfold increase in **stake size**.



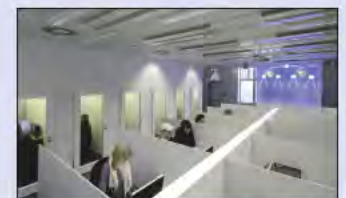
However, we observe that less people are prudent than risk-averse when lotteries are displayed in the mathematically equivalent **reduced** form (displayed above) rather than in **compound** form.



Harvard Business School



Nankai University



University of Duisburg-Essen



AN EXPERIMENTAL STUDY OF EXPLOITATION AND EXPLORATION DECISIONS BY TEAMS

Research Question and Motivation

A large literature in economics, management science and statistics has studied how humans make decisions that have to trade off between exploitation and exploration. In these settings agents have to decide between different options that generate uncertain payoffs (typically referred to as bandit problems). As these decisions capture the essence of the decisions that have to be made during an innovation process, they have recently moved into the focus of research in economics and business studies. Yet, new research and business endeavors are usually undertaken by teams rather than individuals.

Experimental Design

We use 10 games introduced by Gabaix et al. (2006) which reflect a special case of the bandit problems studied by Gittins (1979) and Weitzman (1979). In these games a player has to choose between 3 projects i with known probabilities P_i of generating payoff V_i if the respective project is successful. For a payment of search costs c_i the agent can explore project i and is informed whether it was successful. Once the agent has decided to stop exploring he or she can pick the highest paying project and earns the respective payoff minus search costs. Optimally the agent would always select the exploration of projects based on the Gittins-Weitzman (GW) index. The graphic to the right illustrates an example: The subject can sequentially investigate 3 different projects. The optimal (GW) and the "directed cognition" (DC) sequences are shown as well as the expected payoff, given that the search costs are 1.

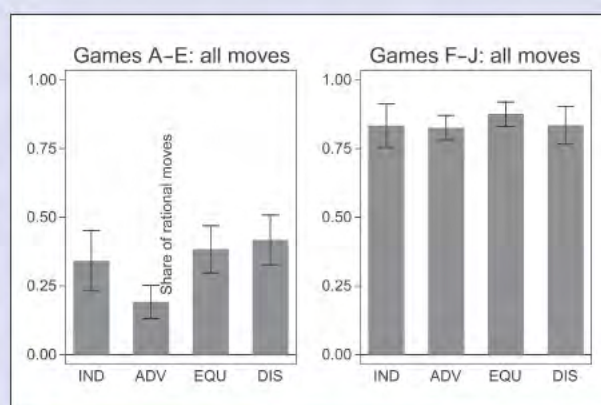
In the present study we build on the work by Gabaix et al. (2006) who experimentally study individual behavior in a simple bandit problem. They compare observed behavior to optimal behavior as well as to the myopic "directed cognition algorithm" (DC). We extend their experimental design to focus on two questions:

1. Are teams better in trading off exploitation and exploration than individuals?
2. How do asymmetric incentives within teams affect team performance?

Projects	$V_1 = 1$ $P_1 = 1.00$	$V_2 = 21$ $P_2 = 0.09$	$V_3 = 10$ $P_3 = 0.76$	Expected payoff
GW sequence	3 rd	1 st	2 nd	7.12
DC sequence	3 rd	2 nd	1 st	7.03

We ran 4 different treatments (summarized in the table below) in the elfe laboratory of the University of Duisburg-Essen. The treatments differ in whether an individual or a team makes the decision and in the share of wage the subjects receive. Teams were able to chat and the 1st subject enters the decisions.

Treatment	Wage 1	Wage 2	N
IND	100 %	-	24
ADV	130 %	70 %	48
EQU	100 %	100 %	48
DIS	70 %	130 %	46



Results

The graphic on the left-hand side shows the share of rational moves for Games A to E and the graphic on the right-hand side for Games F to J. Both graphics include 95 % confidence intervals. Comparing the amounts using Mann-Whitney-U tests reveals some differences between the treatments. When we analyze Games A to E (here, the rational and for that optimal sequence is different from the DC sequence) we find weak significant differences between the IND and ADV ($p = 0.090$) treatment as well as in case of EQU and ADV ($p = 0.056$) and significant differences between ADV and DIS ($p = 0.035$). We do not observe any significant ($p \geq 0.472$) differences in case of Games F-J (here, the two search sequences are the same).

In summary teams are not better in trading off exploitation and exploration decisions than individuals. Surprisingly, a higher wage of the decision-maker leads to worse performance.



WHEN AND WHY DO INCENTIVES NOT WORK? THE ROLE OF CULTURAL DIFFERENCES

Traditionally, innovation activities ought to be confidential within certain groups or individuals before marketing process, and will be protected by intellectual property rights (IPR) laws, for the economic benefits of innovators and encouraging further innovation attempts (e.g. Gould and Gruben 1996; Helpman 1993). However, open innovation has attracted an avalanche of interests of many practitioners and scholars, and is gradually becoming an acceptable scientific and managerial paradigm since last decades (Chesbrough 2003, 2006, 2010; von Hippel 2005; Quan and Chesbrough 2010; West et al. 2014).

The major challenge of open innovation is how to encourage firms and individuals to open their own private ideas and innovations, given that the traditional innovation paradigm is dominating. In this paper, we focus on the effectiveness of social inducement, which could be understood as an (external) intentional consideration that leads people to take action, using an experimental approach.

We introduce two models to describe the investment problem where investors decide to allocate the resources into open innovation projects or into traditional innovation projects. In the first model, the rate of return on investment in open innovation is less than one, which reflects the public good property of open innovation; however, open innovation can still be beneficial for an investor, because we also introduce spill-over effect and assume that traditional innovation projects profit from open innovation investment. We then take **Uncertainty** into account in the second model to make the model more realistic.

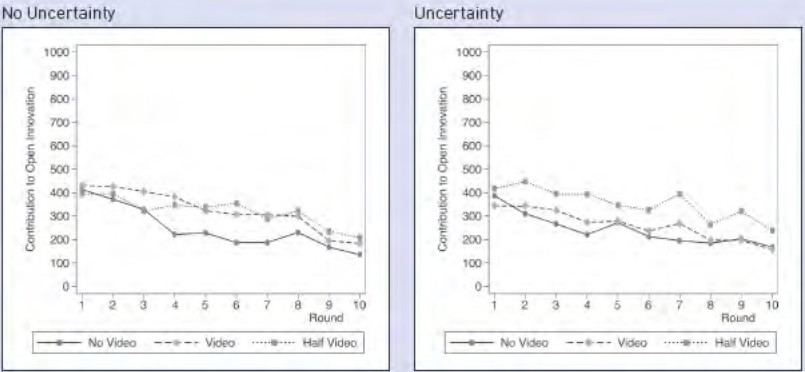
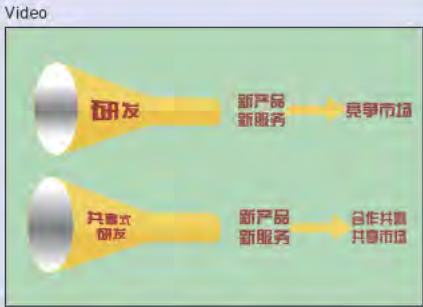
Social inducement is in the form of a six minutes self-directed video and contains three pieces of information:

- 1. Traditional innovation with property right protection is dominated and has been important in history.
- 2. Open innovation could be more beneficial.
- 3. Free riders may exist.

The level of social inducement differs across treatments. In **No Video** settings, subjects make investment decision without any further information other than a standard instruction. In **Video** settings, all the subjects watch the video designed and produced by us before they turn into the game stage. In **Half Video** settings, only half of the subjects in each group watch the video before decision making and they are informed, that the other two members do not see the video. Combining the two described models and three different social inducement levels, we have a 2 × 3 design and totally 6 treatments:

Social Inducement Level	Models			
	Model 1		Model 2	
	No Uncertainty	No Video	Uncertainty	No Video
	No Uncertainty	Video	Uncertainty	Video
	No Uncertainty	Half Video	Uncertainty	Half Video

The experiment consists of 10 repeated rounds with fixed groups and it lasts 75 Min. Every treatment contains 8 independent groups and each group has four group members. Experiments were conducted with 192 subjects at the Smith Lab for experimental studies at the University of Nankai, Tianjin.



Results

- 1. With uncertain economic environments, social inducement leads to a higher open innovation investment, if both informed and uninformed subjects exist.
- 2. Subjects who have information advantages are motivated to contribute more in order to persuade subjects with less information to follow.
- 3. Uninformed subjects are keener to believe and follow the "leader" who have extra information if there is uncertainty in decision making.

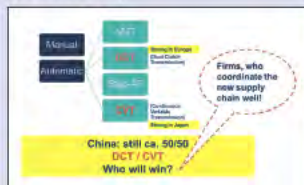


TECHNOLOGICAL INNOVATION, INFORMATION PROCESSING AND SUPPLY CHAIN INTEGRATION A CONCEPTUAL MODEL

Research Motivation

Automotive transmissions

- Transmissions are central and complex parts that determine how it feels to drive a car
- Outsourcing of transmissions has increased strongly
- Coordinating transmission development with suppliers has become more complex, as more electronics and software are added and hybridization of vehicles increases
- Japanese and German carmakers focus on different transmission types (CVT vs. DCT)



- Whether CVT or DCT transmissions will dominate the Chinese market is still undecided
- Successful integration of the newly complex co-development with suppliers is a critical factor for this

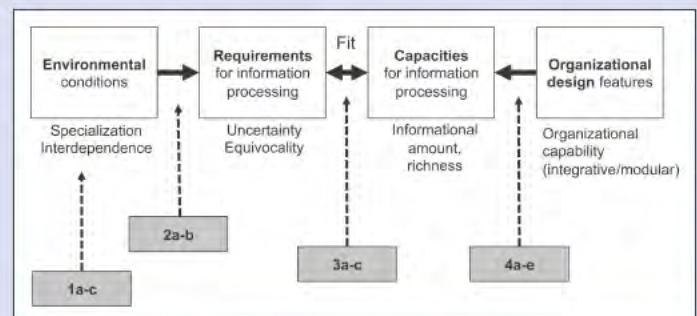
How have requirements for integration changed and how do automotive firms react to this in Japan and Germany?

Research Questions

- **Integration requirement change:** How has technological innovation changed the integration requirements for transmission development with suppliers?
- **Integration effort change:** What reactions to these changing requirements can we find on the firm level?
- **Interaction with institutional environment:** How do key variables of technological change and supply chain integration interact in Japan and Germany? What challenges does the Chinese market pose?

Empirical Approach

- **Direction of interest:** How do key variables of technological change and supply chain integration work together? (inductive/exploratory approach for hypothesis generation)
- **Collecting rich information** recommended (Eisenhardt/Graebner 2007)
- **Analysis guided by the theoretical framework** of the information processing approach (Daft & Lengel 1986; Egelhoff 2005)
- Discussion with transmission development teams of automotive OEMs and transmission suppliers in Japan and Germany in 10 semi-structured interviews between 2014 and 2015
- **Test & refinement** of implications with industry representatives at three further meetings in Japan and Germany
- **Generation of testable propositions** within theoretical framework



Propositions

- 1a Rising ECU complexity increases tier-one supplier specialization
- 1b Rising ECU complexity increases supply chain interdependence
- 1c Rising demand for cross-technical integration increases supply chain interdependence
- 2a OEM equivocality strongly increases by higher specialization
- 2b OEM uncertainty moderately increases by higher supply chain interdependence
- 3a Efficient firms match equivocality increase with higher capacity for rich info processing
- 3b Efficient firms match uncertainty increase with capacity for processing higher amounts of information.
- 3c National differences determine preferences in information processing:
German OEMs: high > rich information, Japanese OEMs: high & rich information
- 4a Japanese OEMs: focus on information processing inside existing supplier networks, rather than outside networks
- 4b German OEMs: use both existing and new supplier networks
- 4c Chinese OEMs with quasi-open modular product architecture: establish industry-wide inter-module standards
- 4d Chinese OEMs with quasi-open modular product architectures: low focus on product innovation
- 4e Chinese OEMs with more integral product design practices: higher focus on product innovation

Summary of Findings

- **Findings:** Overall, we find symptoms of two larger trends: increasing specialization and technological linkages and a need to increase external supply chain integration beyond traditional structures. Comparing the effects on Japanese and German incumbents, we find that increasing external supply chain linkages proves to be harder for Japanese OEMs. Tight links and routines in the Japanese supply chain networks may harm OEM efficiency under the new technological conditions, e.g. the lack of complete part specifications and high demands for customization. These are barriers to obtaining information from foreign supplier networks. Looking at effects on emerging market firms, Chinese OEMs use quasi-open modular production settings in transmission development and lean strongly on inputs from specialized foreign tier-one suppliers. Speed advantages must be weighed against long-term disadvantages of dependence and insufficient R&D investments.
- **Practical implications:** OEMs wanting to adapt complex existing internal structures to the changing demands for information processing should focus first on improving internal capacities by improving the amount and richness of information flow. Implementing new standards for simultaneous and standardized software development across the supply chain is a key point for this. A second step should be to boost the internal capacity to process higher richness of information, i.e. to understand the meta-knowledge necessary to integrate across technological areas in ECU development.



DESIGN AND ADAPTATION OF VALUE PROPOSITIONS FOR ELECTRIC VEHICLES (EVs)

Research Question and Background

The market penetration of electric vehicles is low in Germany as well as in China [1]. It remains a central task for automotive firms to create new value to overcome the numerous perceived barriers [2][3]. The added value has to be stated in new and strong value propositions (VPs) [4] especially in the case of innovations. The corresponding business model has to be changed from product to service orientation [5]. Changing the customers' environment for value creation can lead a change for their mobility behavior [6].

The dissertation project contributes to the under-researched field of value propositions by considering the companies' and the consumers' perspective on value in an international context. It aims to picture the process of designing new value propositions in a well established industry and to identify framework for the components of value propositions as the output of this process. The two research questions that are going to be answered are:

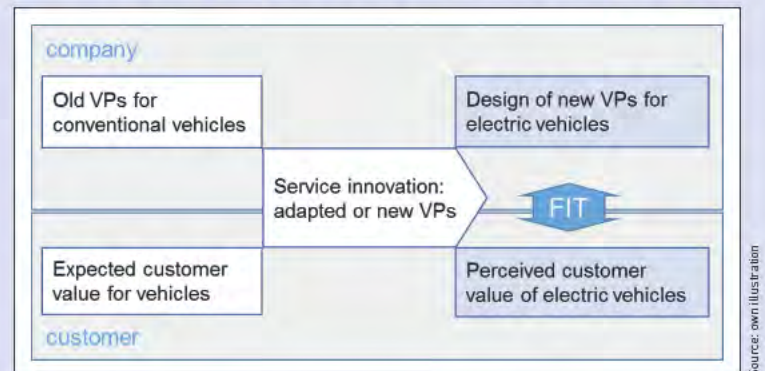
- How can automotive manufacturers conceptualize their innovation of value propositions for electric vehicles oriented at the customer perceived value?
- How can automotive manufacturers adapt their value propositions to local markets to improve the perceived value?

Theoretical background:

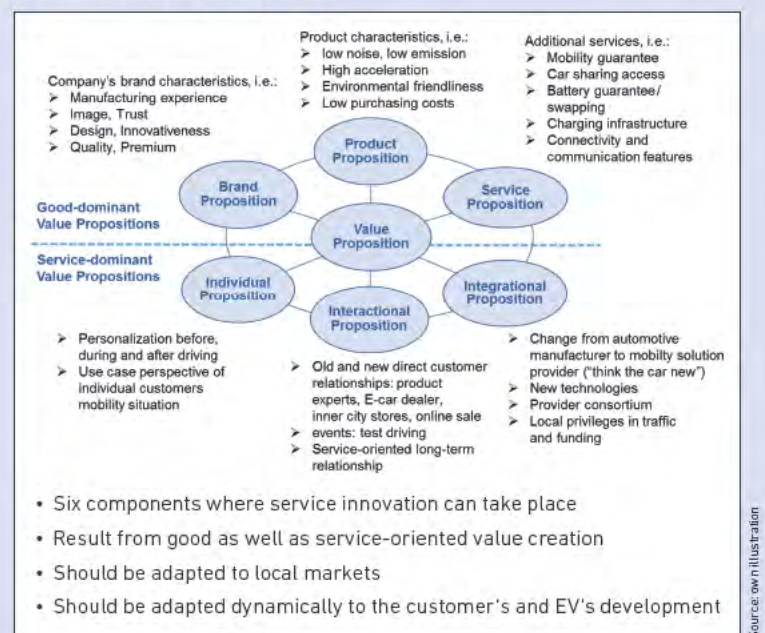
- Market and competence-based approaches that explain value propositions
- Economic and behavioral approaches that explain customer value

- [1] Wiedmann, K.P. / Hennigs, N. / Pankalla, L. / Kassubeck, M. / Seegebarth, B. (2011): Adoption Barriers and Resistance to Sustainable Solutions in the Automotive Sector. In: *Journal of Business Research* 64 (11), 1201–1206.
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Process of Designing New Value Propositions for EVs (Fig. 1)



Output of Current and New Value Propositions & Examples for EVs (Fig. 2)



- Six components where service innovation can take place
- Result from good as well as service-oriented value creation
- Should be adapted to local markets
- Should be adapted dynamically to the customer's and EV's development

1. Explanation of the process of creating new value propositions for EVs oriented at customers' perceptions (Figure 1)
2. Derivation of a framework for the components of value propositions from theory (Figure 2: blue circles)
3. Empirical analysis of current and potential new value propositions for electric vehicles along qualitative interviews with three German automotive manufacturers and their Chinese subsidiaries (Figure 2: examples printed in black)
4. Empirical analysis of customers' perception of value propositions in Germany and China (results expected soon)

Source: own illustration

Source: own illustration



TECHNICALLY OPTIMAL ELECTRIC VEHICLE DESIGN FOR USER GROUPS IN CHINA

Research Question and Motivation

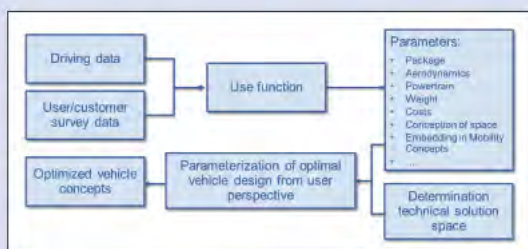
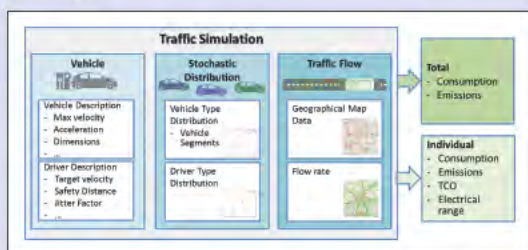
Sustainable and energy efficient drive solutions dominate current vehicle development strategies driven by political, social and technical megatrends (Schramm and Koppers 2014). As shown in several studies, the energy consumption of a vehicle is affected by a wide range of factors covering i.a. the road type (urban, highway) or the driving and usage behavior (Ried et al. 2013, Ernst et al. 2013). These user individual factors are represented in real usage profiles. For vehicle development as well as current and future market analysis real usage profiles have to be used in order to gain realistic consumption data, which differ from the data derived through test cycles like the New European Driving Cycle (NEDC) (Hesse et al. 2012).

Although efforts were made to describe real world driving pattern, real world driving cycles aren't representing all individual driving patterns. Especially for China investigations are rare.

The research questions are:

Which vehicle fits to which user and how does a vehicle have to be designed in an optimal way to fit to a user group? This applies to an optimal vehicle concept or an optimal vehicle fleet mix for actual and possible users.

Concept



The empirical analysis includes a driving data analysis using data loggers in China to investigate the local individual driving patterns. The results are compared to similar investigations in Germany.

Results

Due to different traffic conditions and road types not only the framework conditions but also the driving pattern differ between China and Germany. Thus, an adaptation of the vehicle design to the local market is necessary.

Even within China, differences in the usage behavior (Figure 2) and driving behavior (Figure 1) can be identified between the investigated cities Beijing and Wuhan. In general, the driving data show a less dynamic driving style with low acceleration in both regions. The usage profile is dominated by short trips with a low velocity.

The results from the presented analysis help to optimize electrified vehicle design to the customer needs. For instance, the less dynamic driving style leads to lower power demand. Therefore, the electrical machine can be dimensioned smaller (Figure 3).

On basis of the driving profiles realistic consumption data can be derived through vehicle simulation (Table 1) to calculate customer relevant values like Total cost of ownership (TCO) and CO₂ emissions.

Figure 1: Examples of driving behavior characteristics in China

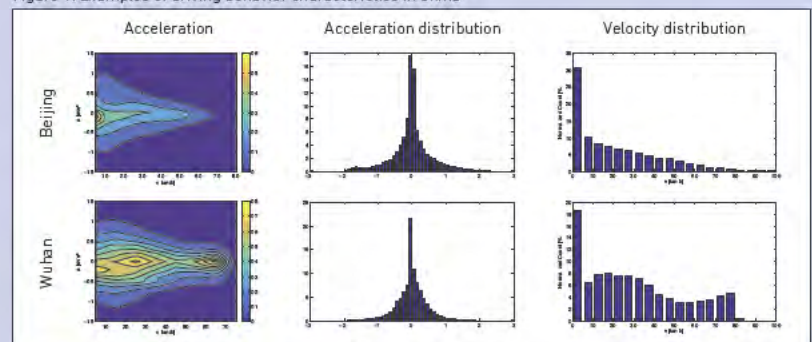


Figure 2: Examples of usage behavior characteristics in China

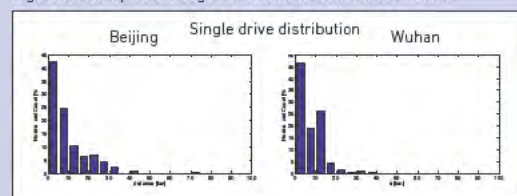


Figure 3: Distribution of electric motor torque over velocity

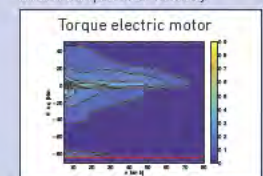


Table 1: Simulated consumption based on driving data (Wuhan) for different drivetrains

Vehicle type	Energy source	Average consumption (energy source unit)	Average consumption (comparison unit)
Internal combustion	Diesel	3.7 l / 100 km	36.2 kWh / 100 km
Internal combustion	Gasoline	3.9 l / 100 km	35.4 kWh / 100 km
Plug-in hybrid electric	Gasoline	0.1 l / 100 km	14.3 kWh / 100 km
Battery electric vehicle	Electric power	13.2 kWh / 100 km	13.2 kWh / 100 km

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INSTITUTIONAL DIVERSITY, ORGANIZATIONAL DEVELOPMENT, AND INNOVATION IN CHINA'S BIOPHARMACEUTICAL INDUSTRY

Theoretical Background

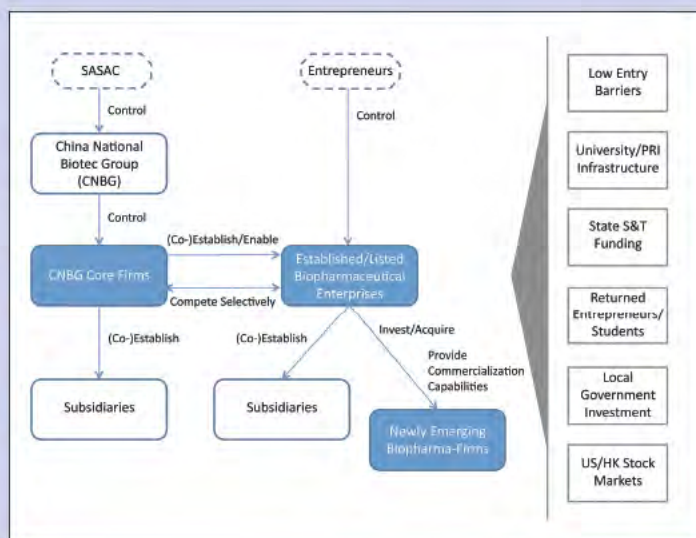
The research project contributes to the literature on national differences in capability development and innovation. According to the relevant literature, the nature and direction of innovative activities and strategies is shaped by the institutional setting. Different varieties of capitalist economies cope differently with technological opportunities. Institutions and distinct approaches to innovation are linked through the organizational forms that structure pertinent learning processes.

Problem Statement

One of the pivotal problems of the (static) frameworks of the comparative capitalisms field is to account for institutional heterogeneity and (off-equilibrium) dynamics. The Chinese case is destined to provide stimulating insights in this regard. Previous research on China's capitalist economy has already highlighted the relevance of institutional heterogeneity for the development of domestic firms and business systems. However, the domestic economy is typically portrayed as being fully segmented along ownership and/or regional lines. While instrumental in giving an elegant account of the Chinese economy, it is ill-suited to illuminate the organizational development specifically within the competitive sectors of China's industrial economy. In these sectors, which are the main drivers of change, ownership boundaries are continuously blurred and rearranged while regional boundaries are transcended. The current project contributes to an understanding of these processes by shedding light on the organizational and industrial dynamics within one of the major competitive sectors, the biopharmaceutical industry, which is one of the pillar and strategic emerging industries designated by the Chinese government.

Analytical Perspective

In order to capture the dynamics of the organizational integration of economic activities and markets, the research project adopts a firm-centric approach that takes the (potential) diversity of firms and institutional resources seriously. Drawing inspiration from tile-based (German-style) board games, the analytic framework envisions the sector as an evolving playing field that gradually becomes covered with tiles. Each tile represents a single product (market) and each patch a set of markets with similar technological foundations. The players (firms) use institutional and organizational resources to develop capabilities which allow them to add, colonize, and occupy the tiles (markets) within the (domestic) game. Accordingly, the focus is on tracing the players' moves and on analyzing the resulting organizations. The questions that are posed include: Where do the players have their initial capabilities from? What kind of "colonizing" patterns emerge? How do the various players relate to each other? What kind of institutional resources do they utilize to advance their position? What kind of capabilities are being developed?



Findings

The research demonstrates how China's biopharmaceutical industry evolves from a range of public S&T projects within a few selected immunotherapy areas. In the sectoral evolution, the corporatized public research institutes under the China National Biotec Group play a key role. They are the only firms that cover a larger number of markets. Some of the most influential early industry entrants owe their existence to technological spillovers from these institutes. Low regulatory hurdles have eased the entry as integrated biopharmaceutical firm. Early market success has enabled firms to list on stock markets, especially in the USA and Hong Kong where listing requirements are lower. Listed firms frequently expand by making equity investments in promising new entrants. The cumulative dynamics are reinforced by the investments of local governments in entrepreneurial firms and localized subsidiaries to hasten local sectoral development.



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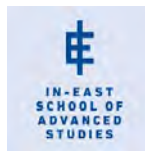
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MAP OF DUISBURG CITY CENTER

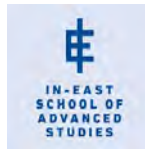




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