A Note about the Cover

The cover was designed by Gitta Noll.
It is based on an image of ITO’s visualisation
of flights over Europe.
The image uses FlightRadar24 data over an
OpenStreetMap;
Source: www.itoworld.com

Impressum

Hochschule Bremen,
Fakultät Wirtschaftswissenschaften,
Institute for Transport and Development,
Werderstr. 73, 28199 Bremen

Design: Gitta Noll
Bremen 2011

ISSN 2191-4753
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREFACE</strong></td>
<td>04</td>
</tr>
<tr>
<td>Dietwart Runte, Dean of the Faculty of Business and Economics</td>
<td></td>
</tr>
<tr>
<td><strong>PROFILES OF RESEARCH PROJECTS IN TRANSPORT ECONOMICS</strong></td>
<td>07</td>
</tr>
<tr>
<td>German Airport Performance</td>
<td>08</td>
</tr>
<tr>
<td>German Airport Benchmarking</td>
<td>09</td>
</tr>
<tr>
<td><strong>PROFILES OF RESEARCH PROJECTS IN DEVELOPMENT ECONOMICS</strong></td>
<td>13</td>
</tr>
<tr>
<td>Promoting Agro-Industry in West Africa</td>
<td>14</td>
</tr>
<tr>
<td>Economic Diversification and Innovation in Uzbekistan</td>
<td>16</td>
</tr>
<tr>
<td>Promoting Sustainable Urban Transport in Vietnam</td>
<td>18</td>
</tr>
<tr>
<td>Options and Constraints for Economic Policies in Small States:</td>
<td>20</td>
</tr>
<tr>
<td>The Examples of the Baltic and the South Caucasus States</td>
<td></td>
</tr>
<tr>
<td>The Impact of Financial Market Speculation on Food Consumption in Developing Countries</td>
<td>22</td>
</tr>
<tr>
<td><strong>GUEST CONTRIBUTION</strong></td>
<td>26</td>
</tr>
<tr>
<td>Karl Hans Hartwig, Westfälische Wilhelms-Universität Münster</td>
<td></td>
</tr>
<tr>
<td>City toll: An Efficient Policy Strategy for Hanoi?</td>
<td></td>
</tr>
<tr>
<td><strong>RESEARCH REPORTS BY ITD-RESEARCHERS</strong></td>
<td>35</td>
</tr>
<tr>
<td>Hans H. Bass, Mali’s Agro-Industry: A SWOT-Analysis</td>
<td>36</td>
</tr>
<tr>
<td>Karsten Fröhlich, Are Airports Two-sided Platforms?</td>
<td>48</td>
</tr>
<tr>
<td>Christopher Langelage, Viet Nam’s Transport Sector Problems</td>
<td>56</td>
</tr>
<tr>
<td>Vanessa Liebert, Benchmarking of Utilities for Performance Improvement:</td>
<td></td>
</tr>
<tr>
<td>The Case of Airports</td>
<td>60</td>
</tr>
<tr>
<td>Hans-Martin Niemeier, Regulation of Airports: What Can India Learn from Germany?</td>
<td>68</td>
</tr>
<tr>
<td>Adél Németh, European Airline Mergers – Implications for Competition Policy</td>
<td>74</td>
</tr>
<tr>
<td>Eric Tchouamou Njoya, The Potential Contribution of Aviation to Economic Growth and Poverty Reduction in Sub-Sahara Africa</td>
<td>82</td>
</tr>
<tr>
<td>Alexander Pfannkuche, Recovery of the Baltic States after the Crisis:</td>
<td></td>
</tr>
<tr>
<td>Necessities and Strategies</td>
<td>90</td>
</tr>
<tr>
<td>Detlev Quintern, Cosmopolitism, Scientific Discoveries, and Technological Inventions along the Ancient Silk Road: The Role of Samarkand and Bukhara</td>
<td>94</td>
</tr>
<tr>
<td>Osmund Osinachi Uzor, Constraints and Potentials of Processing Cashew Nuts in Nigeria</td>
<td>100</td>
</tr>
<tr>
<td><strong>PUBLICATIONS BY ITD-MEMBERS</strong></td>
<td>106</td>
</tr>
<tr>
<td><strong>CONFERENCE PRESENTATIONS BY ITD-MEMBERS</strong></td>
<td>110</td>
</tr>
<tr>
<td><strong>RESEARCH-BASED TEACHING</strong></td>
<td>113</td>
</tr>
<tr>
<td>Graduation Theses Supervised by ITD Members</td>
<td>114</td>
</tr>
<tr>
<td>Bremen Summer School 2012: “Fair Trade”</td>
<td>118</td>
</tr>
</tbody>
</table>
Preface
by Dietwart Runte, Dean of the Faculty of Business and Economics, Bremen University of Applied Sciences

In an increasingly globalised world economy, problems resulting from insufficient economic development and inadequate and non-sustainable transport networks have received more and more attention from enterprises, policy makers, civil society organizations, and academia alike. To facilitate research in these areas, the Institute for Transport and Development (ITD) was founded January, 8th 2010 in the Faculty of Business and Economics of Bremen University of Applied Sciences.

The activities of the Institute for Transport and Development include applied research in the fields of transport economics and development economics, knowledge transfer by consulting and the organization of colloquia and expert seminars, as well as the promotion of research-based teaching, particularly the supervision of bachelors’ and masters’ theses within the framework of the institute's research projects, and the promotion of communication among the scientific community by organizing conferences and publishing research results. The institute is co-chaired by Professor Dr. Hans-Heinrich Bass and Professor Dr. Hans-Martin Niemeier.

Research conducted in Universities of Applied Sciences focuses on current affairs and is geared towards solving practical problems. Since its inception following the merger of two departments, our Faculty has continuously developed its research capacities both with regard to solving topical business issues and understanding pressing economic processes. In addition to the above mentioned areas of international economics and logistics, focal research areas of our Faculty include market research, finance, intercultural management, public management, small and medium enterprise economics, and business history. These topics well reflect the structure of the economy in our region with its strong international component and its orientation towards world markets, including modern air, water and land-bound transport, and its already visible potential as a location of 21st-century production and service industries.
A growing number of enterprises, governmental and non-governmental institutions are taking advantage of the capacities provided by researchers from the Faculty of Business and Economics. Furthermore, external funding has been increasingly provided to researchers from our Faculty to enable their participation in national and international projects.

Vibrant applied research is also of great importance to maintain the high quality of our twelve Bachelor and two Master degree courses and our life-long learning programs by introducing students of undergraduate, graduate and extension studies level to up-to-date methodology, motivated by the exposure to “real life” questions.

The economic, social, political, and ecological challenges of the modern world demand responses which transgress national boundaries. Therefore, the international cooperation of scientists as well as international components in academic education have gained greater significance.

More than two decades ago, Bremen University of Applied Sciences recognized these necessities and began to internationalize nearly all but a few of its study programs, at the same time furthering the endeavors of its faculty to seek research alliances with partners outside of Germany. Today, Bremen University of Applied Sciences is, according to a recent study by the German Academic Exchange Service and the Alexander-von-Humboldt Foundation (Profildaten zur Internationalität von Hochschulen, 2009) among the most internationalized large German Universities of Applied Sciences, being ranked first place with respect to the number of international degree courses, the counseling of foreign students, international cooperation agreements, and faculty exchange in the European-wide Erasmus framework.

ITD-projects related to international development issues have included topics such as the agro-industrial development in West-Africa, a research project on the impact of financial-market speculation on grain prices and hunger in developing countries, as well as a post-doctoral research project on innovation policies in Uzbekistan.

In the field of transport economics, a major project has been “German Airport Performance” (GAP), which aims to compare the economic performance of international airports in Germany with airports in other countries. Another project is “German Aviation Benchmarking” (GAB), which analyses product and price differentiation of airports, the optimization of supply chains, and the management of regional airports.

Projects in which transport and development issues particularly intersect include a joint German-Vietnamese effort to develop sustainable urban transport systems in Hanoi, Viet Nam, and a doctoral-research project on the potential contribution of aviation to economic growth and poverty reduction in Sub-Saharan Africa.
Among the main funding agencies for the ITD’s projects are the United Nations Industrial Development Organisation (UNIDO), the German Federal Ministry for Education and Research (BMBF), the German Academic Exchange Service (DAAD), the Deutsche Welthungerhilfe, and the Wolfgang-Ritter-Stiftung.

The ITD has also organized a number of conferences, such as an international conference on the impact of the financial crisis on Africa (co-funded by the Faculty of Business and Economics), and participated in international conferences und workshops in the framework of the German Aviation Research Society.

An impressive number of Bachelor and Master Theses and doctoral research seminars have also been supervised by the Institute’s directors.

All in all, the first two years of the Institute for Transport and Development (ITD) activity have been accompanied by hard work on the part of all of the institute’s researchers, but all the more so by very satisfying results.

This first ITD Annual Report includes a guest article by Professor Dr. Karl-Hans Hartwig of the University of Muenster as a representative of the large of number of academic institutions the ITD cooperates with. Furthermore, the report includes brief descriptions of the institute’s ongoing or recently finalized research projects as well as a number of research reports being written by various academic members of the institute.

On behalf of the Faculty of Business and Economics of Bremen University of Applied Sciences, I hope that this publication attracts the attention of the scientific community, of policy makers and the general public, both in Germany and internationally. Personally, I wish the ITD and its members every success in their scientific endeavors for the benefit of the stakeholders in the important issues of economic development and ecologically sustainable transport networks.
German Airport Performance (GAP)

Objectives
The project aims to investigate the changing nature and performance of airports, their commercialisation and competitive environment, as well as the need for further financial and environmental regulation.

Motivation
The project was motivated by
- a changing institutional structure since the liberalisation of the aviation market;
- below-average results of German airports in an international comparison in several benchmarking studies; and
- international benchmarking projects on airport performance merely including large airports in Germany.

Methodology
- Data collection and intensive field work in cooperation with the airports;
- productivity and efficiency analysis to identify best practice airports and gaps of less efficient airports;
- use of several techniques (partial productivity measures, TFP, DEA, SFA);
- regression analysis to illustrate relationships between efficiency scores and potential factors affecting performance.

Funding of the project
(2005–2009)
Bundesministerium für Bildung und Forschung

Lead researchers
GAP is a joint project of Bremen University of Applied Sciences (Prof. Dr. Hans-Martin Niemeier), Berlin School of Economics (FHW, Prof. Dr. Jürgen Müller), and International University of Applied Sciences Bad Honnef (Prof. Dr. Hansjochen Ehmer)

Publications
A list of publications (2005-2009) is available at www.gap-project.de
German Airport Benchmarketing (GAB)

Background

Air transport in Germany is an important industry and has generated substantial growth. The industry provides large direct and indirect employment for up to 850,000 jobs. In the last decades, the international air transport industry went through several crises. Despite this, it has seen great expansion. The liberalization of the air transport market and the emergence of low cost carriers (LCCs) have led to increased competition and have put downward pressure on prices and cost structures of Full Service Airlines (FSAs) and the entire value chain.

GAB builds on the German Airport Performance (GAP) research project jointly conducted by the Universities of Applied Sciences Bremen, Berlin, and Bad Honnef. Whereas GAP's focus was on airports, GAB aims at expanding the analysis from the airports to the entire air transport value chain.

Objectives

The goal of this project is to carry out a comprehensive analysis of the air transport value chain and to map out practical strategies and formulate recommendations for action. Apart from this, the interdependencies, the causal mechanisms, and vertical relationships between the firms will be discussed. It is only in this way that improvement and optimization potentials which extend beyond the productivities of single firms in the supply chain can be determined. These optimization potentials are of great importance both for the businesses and for the government, leading to joint achievements that could not be reached by one party alone.
The focus of this project is displayed in the following parts of the value chain:

- **Airlines**

Using a solid database, the productivity and efficiency of LCCs and FSAs will be analyzed with respect to the effects of liberalization, privatization, increased competition and external shocks. Furthermore, an analysis of the strategies and the cost structures of the Airlines will be highlighted. In the last years, the FSAs, the LCCs and also the charter and regional airlines have changed their strategies. But how successful were they with the new strategies? Did they really hold out with the new strategic positioning or did they fail. And if yes, what were the reasons? How large is the share of the costs over which airlines have a control and how do they manage reducing their costs successfully?

- **Airports**

Based on benchmarking analyses from the GAP-Project, three modules will be analyzed in this part. In the first module, the question of why product and price differentiation at the airports have not been given enough attention will be considered. The efficiency of LCC terminals, peak-pricing, and airport charges discount schemes and other incentives will be examined. With regard to peak-pricing, the congestion costs at congested German and European airports will be estimated using econometric methods.

The second module will concentrate on the increased competition pressure on airports, which has enhanced the importance of revenue from non-aviation activities. Which strategies (for example, shopping mall development, parking space management, etc.) are the airports following in this area and how do they cope up with the growing LCCs’ services? Do they come into conflict with the FSAs? How could the supply chain be optimized through cooperation? The third module will deal with the management of regional airports. The success of LCCs has led to increased focus on these airports in the discussions on transportation policy. The most controversial point is the role of subsidies and the economic benefits of air transport for the regions. In this regard it will be analyzed whether and to what extend subsidies could be reduced with the help of efficient cost management and further increase in revenue from commercial activities.

- **Air Traffic Control**

This section will use the existing literature to estimate the impact of ATC on airlines, airports as well as its role on the value chain. In doing this, it will identify synergies and efficiency potentials and work out proposals for reform regarding pricing policy. Due to the complexity of ATC no benchmarking studies will be conducted. This part will nonetheless deliver valuable insights for the analysis of value chain. The air transport supply chain In this part the insights and answers gained from the above sections will be compiled.
Most importantly, the question to be answered is how the efficiency and productivity of the value chain can be increased. Problems are to be expected especially at the interfaces among actors in the supply chain. At this point potentials for efficiency increase will be determined. Do airports adjust to the strategic positioning of airlines?

Can improvement in non-aviation activities at airports lead to improvement in the efficiency of the value chain? Should airports offer ground handling services or should they outsource them? Where and how can actors cooperate so as to achieve better results? Are external logistic providers as modern coordinators in the air transport sector conceivable?

Cooperation partners

**Partners from Practice**


**Academic Partners (Germany)**

Jacobs University Bremen, Prof. Brune-kreeft; Institute for the World Economy Kiel, Dr. Wolf; University of Paderborn, Prof. Gilroy; Technical University of Dresden, Prof. von Hirschhausen; German Aerospace Center, Prof. Reichmuth; University of Applied Sciences Worms, Prof. Dr. Fichert.

**Academic Partners (outside of Germany)**

Free University Amsterdam, The Netherlands, Dr. Pels; University of Westminster, United Kingdom, Dr. Dennis; University of Rome, Italy, Prof. Mancuso; University of Maryland, United States, Prof. Dresner; Wilfred Laurier University, Canada, Prof. Morrison; University of British Columbia, Canada, Prof. Gillen; Monash University, Australia, Prof. Forsyth.

**Funding of the project (2008–2011)**

Bundesministerium für Bildung und Forschung

**Project Managers**

Prof. Dr. Hans-Martin Niemeier, Karsten Fröhlich, Adél Németh, and Eric T. Njoya
West Africa has a huge potential for agro-industry development – particularly in the food sector. Today, however, most processed food is imported. Improving the local value-adding and national and international marketing could considerably contribute to employment and income generation and thus help reduce poverty, stabilize food provision, and facilitate sustainable economic growth.

As it is predominantly women who are engaged as (small) entrepreneurs in food processing, the growth of this industry would also be of preeminent relevance for the participation of women in the economy in general and for their economic empowerment.

The development of this subsector is impeded by a number of obstacles, including shortcomings in ecologically sustainable production, economic efficiency, loss-minimizing and clean harvesting and storage, appropriate technical processing and adequate channeling of the products into regional and international markets.

### Guiding questions of project phase I

In its first phase as a consultancy project commissioned by the United Nations (in 2010), the research was aimed at an in-depth study of Mali’s agro-industry sector and its sub-sectors, including the dynamics of the agribusiness enterprises, the trade relations in the production chain from agriculture to agro-industry, and the institutions which are important for the functioning of the agro-industry. Furthermore, it was also aimed at identifying feasible policies to enhance agricultural growth for agribusiness, upgrading the value chains, and stimulating private enterprise development and investment.

### Guiding questions of project phase II

In its second phase (starting in 2011 and financed by BMBF), which will be in a collaborative venture with West African researchers, the project will be broadened to include an analysis of the food processing industry in Ghana and Nigeria, but will specifically target only those commodities with which West African entrepreneurs can develop a niche market strategy, including

- the actual and potential value chains of indigenous fruits such as mango,
ginger, tamarind, saba, guava etc. from production to transformation (into sauces, syrups, and juices) to marketing in local and international markets; karité (shea) as part of a complex agro-forestry eco-system relevant for both biodiversity protection and for cosmetic and pharmaceutical purposes; and cashew, presently almost exclusively exported for processing to India but offering huge potential in downstream industries such as pharmacology.

The project wishes
- to identify the ecological benefits and economic potentials of increased production and local processing of these commodities and their national and international marketing;
- to provide best-practice examples on a regional level; and
- to develop training modules for technical advisors, economic promotion agencies, and political decision-makers.

Ms Lilian Omafodezi (Bremen University of Applied Sciences); Prof. Dr. Mechthild Schrooten (Bremen University of Applied Sciences); Dr. Osmund O. Uzor (Bremen).

Main publications
(2) Bass, Hans H. (200), Trading out of Poverty? challenges and chances of globalisation for one of the world’s poorest countries (Mali) and its cotton industry, in: IHZ Uniwersytetu Gdański, Wyzwania gospodarki globalnej, 28/1, Gdańsk: University Press, pp. 201-212.
Economic Diversification and Innovation in Uzbekistan

The economy of Uzbekistan is both in the midst of a fairly rapid transition from an agricultural to an industrialized country and an (albeit slow) transformation from the coordination mechanisms of central planning to those of a market-driven economy. Agriculture is confined to ten per cent of the country: intensively cultivated land in oases along the Ancient Silk Road and in Fergana Valley. In spite of some recent diversification into cereals to meet the demands of a growing population, Uzbekistan is still one of the world’s largest producers and the third largest exporter of cotton. Ubiquitous irrigation has contributed to the ecological catastrophe of the drying up of the Aral Sea, and the heavy use of fertilizers and pesticides has severely polluted the soil.

Industry includes mining and gas, metallurgy and textiles. Based on an implicit taxation of the agricultural sector, the construction of capital-intensive plants (automobiles, airplanes, and tractors) is subsidized by the state.

Integration into the world economy is hampered by import substitution policy and the country’s unique geographical position as one of the world’s only two “double land-locked” states. The inflow of foreign direct investment per capital is the lowest among the countries of the former Soviet Union. Emigration, especially of qualified labor, is high.

In recent years, overall economic growth has been considerable. However, the ecological problems, the widespread underemployment outside peak cotton harvest time and the still very low level of per capita income and increasing inequality render the further diversification and the technical and institutional modernization of the economy mandatory.

A long history of scientific achievement and a comparatively well educated labor force constitute a promising basis for such development.
Aims of the research project

The project aims

- to analyze the actual and potential development trajectories of the Uzbek economy in the light of international experience,
- to assess the performance and potential of the Uzbek innovation system with an internationally comparable set of analytical tools and indicators,
- to suggest feasible policies for economic diversification and modernization.

Funding of the project (01/2010–12/2011)

Scholarship by Deutscher Akademischer Austauschdienst (DAAD). The project also includes short-term students’ and lecturers’ exchange between Tashkent and Bremen under the auspices of the DAAD Ostpartnerschaftsprogramm. Co-funding: Konrektorat Internationales der Hochschule Bremen.

Researchers

Dr. Abror E. Azimov, Tashkent State University of Economics; Project coordinator: Dr. Detlev Quintern (ITD, Bremen University of Applied Sciences).

Supervisor

Prof. Dr. Hans H. Bass (ITD, Bremen University of Applied Sciences).
Transport is both a precondition for and a result of economic growth and material wellbeing. However, increasing mobility also triggers negative effects, notably a severe strain on the natural and the architectural environment. In newly industrializing and economically liberalizing economies such as Vietnam, these processes are tremendously accelerated compared to the developments which took place in today’s industrialized countries.

Hanoi has particularly benefited from the country’s economic liberalization, but it also suffers from the ubiquitous motorized individual transport: numerous traffic accidents, severe air pollution, noise, congestion, and the endangering of the capital’s historic Old Town quarters following the growing demands for quick accessibility by motor bikes.

Given the fact that transport is one of the main causes of greenhouse gas emissions, halting the proliferation of motorized individual traffic has become a task which demands international cooperation to mitigate the acceleration of climate change by joint action.

Aims of the project

The cooperation of German and Vietnamese partners

- aims at exploring the possible, probable and desirable futures of the city and its urban transport system, and
- aims at providing assistance to define the decisions required today for the desired scenarios and the envisioned city of the future to become a probable outcome.

Methodology

As the urban transport system is but one sub-system in the urban context, its development cannot be determined without due consideration of other sub-systems. Therefore, this research project has adopted a multi-disciplinary approach, including methods of ecology, economics, sociology and political sciences, town planning, and fine arts.
The first phase of the project was highlighted by a conference in Hanoi in September 2010, which in the framework of the “Germany in Vietnam”-Year took place under the auspices of the German Federal Government to celebrate the 30th anniversary of German-Vietnamese diplomatic relations.

In the second phase of the project, specific instruments will be developed to assist building sustainable urban transport systems in Vietnam, such as a benefit-cost analysis of a toll for motorbikes entering the inner city of Hanoi.
Around the world, the number of small states (population < 5 mill.) has increased. Contrary to widespread belief, some “small states” are among the world’s economic top-performers:

- Although disadvantaged by the small size of their internal markets and without the opportunity to develop into a diversified economy, they are able to exploit short decision-making processes, flexibility and transparency – and to concentrate on global niche markets, especially in the service sector, where economies of scale are not important.

- In international organizations (such as the WTO) which are based on the “one country, one vote” principle, a small country may gain disproportionally large benefits in the few pertinent issues if conceding in the many areas which are of only minor importance for a highly specialized economy.

- To attract mobile factors of production (capital, qualified labor) small states can offer favorable conditions without having to fear countervailing measures by the heavyweights of the world economy.

However, their strong specialization usually implies a high degree of openness as well as a concentration on only a few partners in international business. This can lead to an increased vulnerability to exogenous factors and a high volatility of the economic performance: a “mocha cup” effect (it only takes a light shake for the liquid in a tiny cup to spill over).

Research Target

The research project aims at identifying options and strategies of small European Economies to promote sustainable economic growth and mitigate risks from exogenous shocks. For this purpose, a number of country case studies and focus areas are systematically investigated, including a PhD project on the three Baltic States (Estonia, Latvia, and Lithuania) with a particular emphasis on their financial markets, as well as case studies on the three South Caucasus States (Armenia, Azerbaijan, and Georgia).
Funding of the project
(10/2008–09/2011)

Pre-study financed by Bundesministerium für Bildung und Forschung (BMBF); PhD project financed by Konrektorat Forschung of Bremen University of Applied Sciences.

Researcher

Alexander Pfannkuche, M. A. (ITD, Bremen University of Applied Sciences)

Supervisor

Prof. Dr. Hans H. Bass (ITD, Bremen University of Applied Sciences)

Publications


International Bremen Conference

The Impact of Financial Market Speculation on Food Consumption in Developing Countries

Background

In recent years, actors from outside the agribusiness (“non-commercials”) have tremendously increased their participation in the international futures markets for maize, soy, and wheat. In addition to commercial hedgers, traditional non-commercial speculators and arbitrageurs, “index investors” have become relevant in the market. Reasons for this are:

(1) Structurally rising prices for grain and soy since the beginning of the 1990s. This trend results from demand-side and supply-side forces. Demand-side forces include, first, an increasing usage of grain for other purposes than direct consumption, such as using grain for animal feed and for the production of agro fuels. Secondly, demand for meat (and thus for grain as animal feed) from emerging markets has increased, in particular demand from China.

On the other hand, supply has been relatively falling behind, due to the usage of acreage for the production of presently more profitable commodities such as cotton, as well as due to a neglect of agriculture in many developing countries, especially in Sub-Saharan Africa.

(2) Financial investors are increasingly convinced that investments should be in asset classes not correlated with each other (Markowitz’ portfolio selection strategy). Furthermore, investors increasingly believe that passive portfolio-management strategies, i.e. the “replication” of the market by distributing investments across all assets being represented in popular indices (Malkiel’s random-walk strategies), are more successful than active selection strategies (stock-picking). Finally, an AIG-financed study by Gorton/Rouwenhorst from 2004/2006 has shown that, firstly, the performance of commodities as an asset class is uncorrelated with other asset classes and, secondly, passively managed funds which include a variety of investments into commodity futures have at least a similar performance than other portfolios. This lead to grain and soy futures increasingly coming into the focus of financial investors.

(3) The world-wide liberalization of financial markets enabled investors to collect capital and to systematically invest in agricultural commodity markets. Instruments include Exchange Traded Commodity (ETCs, since 2006), Exchange Traded Funds (ETFs, in the United States since 1993 and in Germany since 2000), as well as investment certifi-
cates (since the 1990s, in Germany in particular since 2004) based on grain and soy as underlyings.

(4) Furthermore, investments in commodities as an asset class have become appealing as a result of two decades of falling returns on investment for traditional low-risk financial investments, such as government bonds. The reasons for this have been: first, a global “savings glut” (Bernanke) both in High Income Countries and in emerging markets, especially in China; secondly, capital from countries such as China looking for safe harbors abroad; thirdly, central banks’ all over the world flooding markets with cheap money to overcome the financial crisis of 2009; fourthly, deteriorating returns for processing industries fuelled by rising commodity prices; and fourthly, a self-enforcing money inflation driven by rising commodity prices.

(5) Finally, high liquidity leads to accelerating feedback processes in which increasing investments in commodities futures lead to higher spot market prices, thus increasing returns for previous investments, which in turn leads to new financial investments into commodity investments – and the building up of price bubbles such as from 03/2007 to 07/2008 and from 07/2010 to 03/2011.

By the end of 2010, according to US regulatory authorities, US-American financial firms were engaged as “index investors” with a stock volume of about USD 14 bn on the market for maize, USD 17 bn on the market for soy, and USD 10 bn USD on the futures market for wheat. (For rice, international futures contracts only play a marginal role). To put this into context: This corresponds to 5 to 10 per cent of the value of the annual global production for these foods.

Guiding questions of the project

The research aims at

- identifying German actors and quantifying the dimension of German investment in food-related financial instruments;
- analyzing the transmission mechanisms from investment in futures markets to prices on spot markets;
- quantifying the effect of index investment in food-related financial instruments on first, the spot market price trend, secondly, the volatility of spot market prices; thirdly, the emergence of price bubbles;
- analyzing the impact of world market prices on food prices in developing countries, especially in Haiti, Kenya, Mali, and Nepal.

Funding of the project


Deutsche Welthungerhilfe e. V.

Researcher

Prof. Dr. Hans H. Bass (ITD, Bremen University of Applied Sciences)

Publication

All publications are available at: http://www.welthungerhilfe.de/5135.html
Road infrastructure under pressure

In most parts of the world road infrastructure in urban metropolitan areas is faced with three fundamental problems: insufficient public funds for (re)investments and coverage of roads; bottleneck capacity and congestion, increasing travel time and travel time risks as well as accidents and fuel consumption; and environmental damages such as noise, air pollution, dust and greenhouse gas caused by urban traffic.

Whereas in industrial countries these problems increased continuously during the last decades, the problems particularly affect newly industrialized countries and formerly centrally planned economies in their process of transition into market economies. The transformation of their economic systems and their participation in the international division of labor causes considerable economic growth and material welfare of the population and thus a rapid increase in transport. The supply of public road infrastructure is not able to satisfy the growing infrastructure demand, resulting in congestion, more severe environmental damages than in the metropolitan areas of the traditional industrial countries, and an exploding number of accidents. As international empirical studies show, serious losses of economic growth and welfare are the outcome, which makes adequate strategies and measurements necessary to avoid these losses (Hartwig / Huld 2010).

The economics and technique of city tolls

According to economic theory, a city toll is a possible solution to solve these problems. Through an appropriate design a city toll is able to raise revenues for infrastructure investment and maintenance, to reduce congestion to a more efficient level, and to improve urban environment. To achieve a “first best solution”, charges are required to ensure that each individual user of the road infrastructure takes the marginal social costs of his trips into his account when deciding if, how, where and when to travel. When individuals decide on the basis of social costs and benefits of each additional trip, and social marginal costs equal social marginal benefits, social welfare is maximized.

Unfortunately, first best tolls need a first best world with perfect information and a perfect technique. A perfect congestion charge for instance not only has to vary with the time of the day and the type of the road, as well as with the time values of road users that happen to be present on the road and with the congestion reason, because the charge should only be imposed in causes of high traffic, but not in the case of accidents, roadwork, bad weather or strikes. This is impossible because of insufficient data on the marginal costs and the lack of widely tested technology to permit fully differentiated tolling to each user according to time, location, type of vehicle, emissions and style of driving.
What can be used in the imperfect real world is “second best” pricing. Its intention is not to cover all costs of road infrastructure and road usage but to collect revenues, to reduce congestion and to mitigate environmental damages of road traffic. A second best toll for an existing road, therefore, covers all short run average costs of operation plus mark ups to reduce congestion, accidents and pollution. A toll for a new road, additionally, has to include average capacity costs, i.e. opportunity costs of capital and depreciation.

In practice, “third best” tolls often are implemented. They are aimed at individual components of the infrastructure costs only and are used to serve specific objectives of transport policy like infrastructure financing, increasing the efficiency of capacity usage or reducing pollution. Therefore, different types of road charges exist: facility related tolls for bridges, tunnels, passes or single roads; cordon tolls, where crossing of defined borders triggers the charge; area tolls, where the charge is imposed not only for the entry to the area but also for trips inside the area; and distance-based charges. All types of tolls can be differentiated by time, vehicle, emission standards, location, traffic volume, car pools, and exemptions.

Currently, four different systems of toll collection and toll control are in use (Beckers et al. 2007): vignettes, video license plates reading (VLPR), electronic road pricing by dedicated short-run microwave communication (DSRC), and global navigation satellite systems (GNSS). Vignettes are stickers affixed to vehicles or paper confirmations verifying that the toll has been paid. Payment has to occur in advance at patrol stations and toll booths by cash and cash card or electronically via the internet. In the stickers-case, monitoring is taken by toll sheriffs, in the other cases vehicle number plates are registered when the toll is paid and automatically collected by mobile cameras and supervisors which match them against a database of vehicles whose drivers have paid the charge (VLPR).

DSRC is a payment system using radio frequency identification, where antenna at the toll gate communicates with an on-board-unit (OBU) on the vehicle. Each passing vehicle is identified and the data is conducted for processing at a back office. The back office forwards data to a central system, which converts vehicle data into trip data and produces the bill. The bill is collected from a bank account or from cash card. The new “Read-and-Write-OBU” is designed with all the processing taking place inside the vehicle itself and permits tolling by distance. In all cases, enforcement has to be done by mobile controls and VLPR.

Technically feasible, but currently not in use due to high costs is global positioning by satellites (GNSS). Small receivers in the vehicles (OBU) determine location, using time signals transmitted by radio from satellites. Because location is possible within a few meters, GNSS permits tolling by distance. After recording time and position
data by OBU, back office possesses vehicle data into trip data which is matched against the pricing scheme to produce the bill. Some systems are able to do all processing inside the OBU itself. Enforcement is done by mobile controls and VLPR.

International experiences

Road charges have a long tradition for several thousand years. But almost always they have been applied to interurban roads, bridges, tunnels, and passes. City tolls are discussed since the 1960s. But it took until 1975, when Singapore started with a broad transport policy combining a vehicle license quota with a congestion charging scheme (Area Licensing Scheme). A cordon toll was introduced for a restricted zone (toll area) of 7 square kilometers to reduce congestion and increase speed. In 1995, tolls where extended to different congested expressways outside the toll area. Tolls were paid by a vignette sticker that had to be affixed to cars, trucks, and motorbikes. In 1998, the vignette system was replaced by Electronic Road Pricing (ERP) using DSRC and cash card paying. Tolls are charged for each trip on weekdays, dependent on time, vehicle, and traffic.

A city toll with the objective to collect revenues for financing investments in urban road infrastructure was implemented in Oslo 1990. Like in Singapore, the toll scheme is based on a cordon toll and an electronic payment system using short-range microwave conveyance. Additionally, users can pay cash. The charge is low and covers a wide area of the city in order to collect high revenues. Inbound vehicles are charged through a flat rate for cars and trucks once a day. Discounts exist depending on the number of trips. Originally the Oslo toll should have been abolished in 1999, when enough money was collected to finance the road projects the toll system was introduced for in 1990. But new projects came on the agenda, and so the toll was extended for the next 15 years.

With the aims of congestion reduction and generating revenues of 240 million Euro per year to finance the improvement of public bus transport, the City of London introduced an “Area Licensing Scheme” in 2003. The toll scheme originally covered the area of Central London, but has been expanded in the meantime. All road users within the area are required to obtain a license on weekdays at daily costs of 12 Euro. Checking is done through 600 video cameras and by automatic number plate reading technology (VLPR). Taxis, motorbikes, buses, ambulances and handicapped persons are excluded. Fees for vehicles without a license reach from 140 to 200 Euro.

The latest example of a city toll in Europe is the Stockholm toll scheme, where a full-scaled trial with road pricing was performed from January to July 2006 and a referendum was held in September, which decided with a majority of 54 per cent of the population to make the toll system permanent. The toll system is directed to
different objectives: traffic and congestion reduction, noise reduction, improvement of the environment and of public transport.

The charge is based on a cordon toll, with a toll area covering the whole central business district and an electronic payment system like in Singapore and Oslo. Tolls will be charged from inbound and outbound vehicles on weekdays and differ between peak and off-peak hours.

In all cases almost all objectives of tolling were reached (see Table 1): Traffic volume and congestion decreased, speed increased, the modal split has been adjusted to public bus transport, pollution has been reduced and the revenues of the toll systems exceed the system costs – in London, however, by a much lower amount than expected. The obvious success of urban road pricing is the reason why a real boom of city toll schemes is observable worldwide (Kossak 2004, Hartwig 2011).

**Table 1: Objectives and Results of City Tolls**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traffic volume</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>−2 %</td>
<td>−25 %</td>
<td>−70 %</td>
<td>−45 %</td>
</tr>
<tr>
<td><strong>Flowing time</strong></td>
<td></td>
<td></td>
<td>−30 to 50 %</td>
<td>−41 %</td>
</tr>
<tr>
<td><strong>Speed</strong></td>
<td>37 → 43 km/h</td>
<td>13.6 → 16.2 km/h</td>
<td>increase</td>
<td>19 → 36 km/h</td>
</tr>
<tr>
<td><strong>Modal Shift</strong></td>
<td>bus transport</td>
<td>bus transport</td>
<td>bus ↑ 6 %</td>
<td>bus transport</td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>toll area:</td>
<td>toll area:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PM$_{10}$:</td>
<td>PM$_{10}$:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>−6.3 %</td>
<td>−1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NO$_x$:</td>
<td>NO$_x$:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.9 %</td>
<td>8.5 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CO$_2$:</td>
<td>CO$_2$:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.5 %</td>
<td>16 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>whole city:</td>
<td>whole city:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PM$_{10}$:</td>
<td>PM$_{10}$:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+2.8 %</td>
<td>−1.5 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NO$_x$:</td>
<td>NO$_x$:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>−0.2 %</td>
<td>−1.5 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surplus</strong></td>
<td>76 Min. €</td>
<td>140 Min. €</td>
<td>52 Min. €</td>
<td>40 Min. €</td>
</tr>
</tbody>
</table>
City tolls and social welfare

However, the achievement of political objectives like the attraction of funds, the reduction of congestion or the improvement of the environment does not say anything about the effects of city tolls on social welfare. Social welfare only increases if the benefits of tolling exceed all of the costs caused by the introduction of user charges. Benefits of urban road user charging are savings of travel time and of travel liabilities, reductions of accidents and pollution, and the revenues generated by charges to finance roads as well as the improvement of public transport. Social costs include all costs of installing and operating the toll system, costs of monitoring and compliance, losses of parking revenues, the charges which are paid by road users, and welfare losses because of deterred and postponed trips as well as increasing congestion and pollution outside the toll area.

Unfortunately, to date, empirical studies on the costs and benefits of city tolls are rare. Only for London and Stockholm the welfare effects of road charges have been estimated – with different results. Whereas Eliasson (2006) evaluates the net benefits of the Stockholm toll scheme of 683 million Euro p.a., Prud’homme and Kopp (2006) calculate welfare losses of 768 million Euro, mainly because of lower time gains for car users, high subsidization of public transport and congestion costs due to more bus transport. For the London congestion charge “Transport for London” (2007) calculates a benefit / cost ratio of 1.4, Prud’homme and Bocajero (2005) estimate a benefit cost ratio of only 0.6.

The different results of the studies are the outcome of different methods and assumptions for calculating the value of time gains and time losses, and of the additional costs of public transport. Anyway, beside these discussions, from empirical estimates as well as from experiences with city tolls, important conclusions can be drawn for the implementation of toll schemes:

First of all, costs and benefits of tolling differ considerably between urban areas because of different time values, consumer surpluses, reactions and adjustments of road users, impacts outside the toll-area, and the effects of revenue spending. Therefore, the introduction of a toll system has to be considered carefully and to be analyzed in detail in each case.

Secondly, benefits are generated mainly by time savings, increases in travel reliability and fewer accidents, but not by environmental improvements. Cost-benefit-analysis show that environmental benefits in London are not more than 1 per cent and in Stockholm less than 8 per cent of total benefits, which corresponds with estimations that found that environmental costs account for less than 10 per cent of the overall external cost of transport. Therefore, charges implemented to reduce pollution only, are inefficient and should not be used except as mark-ups on congestion charges and tolls related to collect revenues. It makes no sense, however, to set charges in relation to
green house gas emissions because green house gasses are decidedly non-local.

Thirdly, the most important costs of tolling are the costs of installing and operating the toll system, costs of compliance and the disutility of deterred trips, and expenses necessary to improve public transport. Because of technical and informational shortcomings no toll has been introduced to cover all types of infrastructure costs, and because of considerable costs of introduction and operation, no toll-city uses distance-based tolls and GNSS. In many instances simple toll systems like cordon pricing differentiated by time can do much of the job whilst waiting for more sophisticated and less expensive solutions.

**Implications for Hanoi**

According to the problems of its road traffic, the capital Hanoi seems to be a genuine candidate for a city toll (ALMEC 2007): poor transport infrastructure with roads in bad condition, uncompleted ring roads and radial roads, missing links to important transaxial roads, and a road network with many intersections; a boom of motorcycles and cars, resulting in traffic congestion, traffic accidents, and pollution; a dramatic increase of private cars and public buses from 2005 to 2020, reducing average speed of motorcycles from 24.8 to 8.1 km/h, for cars from 27.1 to 8.9 km/h, and of trucks and buses from 16 to 7.1 km/h in a business-as-usual-scenario.

As a consequence, the Vietnam Master Plan 2020/2030 on Urban Transport Development Strategies explicitly provides the introduction of city tolls as an “efficient and effective” instrument, especially to fight congestion (Vietnam Urban Transport Development Strategies and Master Plan 2020/2030).

The accentuation of congestion is important because a clear political prioritization of objectives avoids inconsistencies when designing, marketing, and assessing the toll scheme. For example, there is an important distinction between charging for revenue generation purposes and charging roads to reduce congestion (Oehry 2010).

Whereas revenue generation needs rates set to maximize revenues or to recover specific costs and to avoid traffic diversion to alternative routes and modes as it reduces revenue collection, congestion charging has to reduce peak-period vehicle traffic volume and induce travel shifts to other modes and times which are considered desirable. Likewise, modifying the design of a congestion charging scheme to improve the environment, increases the complexity and the costs of running the charging system. The improvements in the urban environment that result may well be real, but smaller than the additional costs. The point is not that ancillary benefits of congestion charges do not exist, are unimportant or should not be taken into account when implementing the scheme, but rather that they should not turn into first priority and that the pricing system should not be modified too much and expanded to a variety of other goals.
When a congestion charge is planned, it is vital to choose the right border of the charging area. Congestion can only be reduced where it is excessive to begin with. Otherwise, the introduction of a congestion charging system would be very hard to sell to the people because many drivers will initially be made worse off and perceived benefits will be low in relation to the costs of implementing and running the system.

In Hanoi, the city center Hoan Kiem, which is one of the most congested areas in the world, is a genuine charging area.

As mentioned above, the charging scheme can take different forms: cordon-schemes, where crossing of a defined border triggers the charge or area schemes, where being in the area defined by a border triggers the charge. The charge might be a flat rate with a fixed amount per day, time-dependent and/or distance based, with tariffs varying according to the time of day.

Modern technical systems, especially GNSS/GPS, will enable all conceivable scheme principals. Therefore, they are the ultimate dream of traffic managers and politicians who always ask for technically most advanced solutions. But experience suggests that satellite technology requires costly investments, is very expensive to operate, and needs user compliance by VLPDR. Especially for congestion charging in a city environment with a limited financial room for maneuver, simpler technologies usually make for a better outcome, with lower costs, lower risks, and a faster implementation (OECD 2010). This applies for the toll scheme, too. In theory, a complex time-place-distance differentiating charging scheme would lead to optimum welfare and efficiency. In practice, charging schemes have to be simple to be understandable and to give clear indications on how to best react (Oehry 2010). Like the Area License Scheme in Singapore, Hanoi should start its congestion scheme with tolls paid by a vignette sticker, which has to be affixed to all motor vehicles except public buses: cars, trucks, motorbikes, and motorcycles. Stickers should be required weekdays from early morning to late afternoon. Instead of material and virtual barriers in form of manned toll stations and number plate recognition systems, enforcement is simply done by special personnel.

The effects of congestion tolls on social welfare depend on both the behavior responses of the travelers and the way the revenues from charges are spent. A congestion charge should help to reduce traffic volumes and improve overall travel time and travel time predictability within the network, but not to create extra funds for the government. Because it is important that those who pay also benefit, the charge must be felt sufficiently such that people will react and the revenue should be spent for road infrastructure, public transport, or even to reduce vehicle taxes, making charges paid deductible from income taxes, as is effectively done in Stockholm. As a result, citizens will drive less and are most likely better off. In Hanoi, public transport is in such a bad condition, that travelers have little opportunity other
than to use their car, their motorbike or their motorcycle to get to work. Therefore, revenues have to be spent primarily to improve public transport.

To generate funds for infrastructure investment programs and for improvements of public transport, a second charge is necessary: it should be low and cover a great area of the city to collect high revenues. The Hanoi toll scheme therefore should consist of a double cordon, with the inner cordon set around the congested central area and an outer cordon along the cities border. All users within the areas are charged. The congestion charge of the central area should be higher than the revenue charge outside the center. For compliance, vignette stickers necessary to drive inside both of the toll areas should be differentiated by colors.

Over time, the simple vignette system can be gradually more refined. And with electronic fee collection and enforcement like DSRC becoming easier and cheaper to employ, the vignette system can be replaced by more sophisticated toll systems like electronic road pricing differentiated by time and vehicle bound pollution standards.

References

Introduction

The major agro-industrial sub-sectors in Mali are the cotton processing industry; animal-based industries (dairy, meat, and leather) and fish processing; cereal processing; sugar refining; the processing of fruits, vegetables, and tobacco; and the processing of cashew nuts and shea (karité).

Cotton processing industry

Cotton is Mali’s most important non-food agricultural product. However, following the industry’s decline in the 1990s, presently less than 1 per cent of Mali’s cotton production is processed within the country (Embassy 2010). Reasons for Mali having been unable to develop a viable textile industry include: (1) the inability to profitably manage a state-owned company, which is related to the lack of human capital and properly functioning institutions; (2) the upward trend of the exchange rate of the F.CFA (anchored to the Euro) vis-à-vis the US-Dollar since 2000, leading to strong import competition in the apparel industry; (3) the dumping of second-hand clothes (friperie) from High Income Countries. In addition, technical backwardness, high prices for raw materials (near world market prices for cotton fiber), high energy costs, and a low demand from consumers for locally produced fabrics have all played their part.

As a result of these developments, in 2006 fabric production in Mali was only about half of the level of ten years before. In 2004, a report found that spinning was the only segment where the West African region was still competitive (CDE 2004). However, there are indications that in recent years Mali has even lost this advantage, as spinning companies have closed down. On
the other hand, as a result of the liberalization of capital imports and the world-wide increased mobility of capital, Mali was also able to attract some foreign capital to make use of the country’s relatively low unit labor costs in the spinning and weaving industry.

One of the few fabric producers in Mali is an integrated textile complex in the city of Ségou, a joint venture with a Chinese company. Another one is a former state-owned company, which after having been abandoned for several years has recently been bought by an overseas Malian, and there is also a spinning mill financed with capital from Mauritius. Investment opportunities promoted by the government of Mali include spinning, the production of loom-state fabric and the manufacture of basindyed cloth (Embassy 2010).

Mali is a net exporter of cotton yarn and a net importer of cotton fabrics. Yarns are exported to neighboring countries (Mauritania, Burkina Faso, and Côte d’Ivoire), and to China. Cotton fabrics were mainly exported to Mauritania. In 2008, 80 per cent of the cotton fabrics imported from Mali were from China.

A recent SWOT analysis (MIGA 2006) mentions low wage rates for unskilled and skilled workers in the Malian textile industry but their poor availability as a characteristic of this industry, while the apparel industry is said to be characterized by both, poor availability and high wage rates for skilled and unskilled workers. However, given the fact that spinning and weaving factories in China and other Asian producer countries are able to exploit larger economies of scale and have access to cheaper raw materials, it does not seem realistic that Mali will be able to attract the large investments obviously necessary to expand cotton processing – at least as long as the gap in unit labor costs between Asian producers and West Africa is not large enough to attract investment aimed at cost-cutting (Collier 2007). On the other hand, the existence of a large market in West Africa with special consumer demand (pagn, booboos) can be an asset also for foreign investors.

Dairy, meat, and leather

Mali possesses one of the largest livestock populations in West Africa. As a result of its steady increase over recent years, also the domestic supply of fresh milk, meat, and hides and skins has also improved. As animals are kept in extremely unfavorable conditions, illness is widespread. As a result, the quality of the traded hides and skins is poor and exporting remains far below the country’s potential.

Processing raw milk to pasteurized milk, curdled milk, yoghurt, butter, ghee, and cheese takes place both in family-based, artisanal small enterprises and in a few semi-industrial and industrial enterprises (LTA / IER 2005). One of the main constraints for the smaller milk-processing units is their low bacteriological quality.
Slaughter of livestock mostly occurs outside of modern, controlled structures. Only a fraction (25 per cent) of the total hides and skins available enters the market, while the bulk of it is domestically processed. Tanning is traditionally performed by female household members. There are also a few industrial tanneries.

Leather is processed in artisanal workshops at a low level of mechanization, the main products being bags, portfolios, and sandals. The poor quality of raw material and the lack of access to capital for technological upgrading constitute the principle bottle-necks for the leather industry. The export of leather declined in recent years. The main export destinations in 2008 were Senegal and Italy.

Fish processing

Mali is one of the largest freshwater fish producers in West Africa. The most important fishing ground in Mali is the Central Niger Delta (80 per cent of catches), followed by Lake Sélingué (Sankarani River) and Lake Manantali (Bafing River). Fishing is exclusively small-scale, often in co-operatives and a seasonal activity (March to June, in the low water period).

Having been stagnant for several years, catches have even sharply declined recently. The reason can be seen in the water resources of the Niger River and the pressures on aquatic ecosystems due to increased water abstraction for irrigation. The construction of the Manantali dam, which created Lake Manantali, also had a detrimental impact on local fisheries (Bosshard 1999). Consequently, the annual average consumption is presently (2005) 8.7 kg, down from 15.1 kg a decade earlier. Nevertheless, fish still provides one third of animal proteins consumed (LTA / IER 2005).

Given the low availability of refrigerator lorries to transport fresh fish to consumers, approximately 80 % of the catches are processed on the spot – usually smoked in different techniques, dried, semi-burnt (*po-lypterus*, Dogon plateau), or processed by oil removal (*brycinus leuciscus*, among the Bozo ethnic group).

The market for processed fish is national; a small amount is also exported to Côte d’Ivoire. Main bottlenecks of the industry include the lack of appropriate technology (fuel-wood saving, quality enhancing) and insufficient transport facilities from fishing grounds to consumers. Smoking techniques have recently been ameliorated following the impact of a FAO development project in Chorkor, Ghana.

The Malian government invites foreign investment to establish production plants for nets suitable for certain species of fish such as *gymnarchus niloticus* and *heterobranchus*, and the modernization of the various stages of the supply chain (Embassy 2010). As an alternative, the establishment of fish farms is promoted, supported by a training centre in Molodo and seedling stations (L’Essor 18/04/2006).
Given the already observable overfishing, technically improved fishing technologies do not seem to be a sustainable solution. Furthermore, as fishing and processing are organized on a family-based division of labor, any industrialization of fishing may be detrimental to the social coherence. Given the labor-intensity of the present processes, more efficient techniques in the face of a limited resource will spell employment losses even in the short run.

Cereal processing

Cereal crops are a major component of Mali’s agricultural production: Rice contributes roughly one third, while maize, millet and sorghum contribute one fifth each. Cereals are also the major component of the Mali diet. In urban areas, rice is the preferred dish (40 per cent of daily food intake), followed by sorghum and millet (together 35 per cent). In rural areas, farmers consider rice as a cash crop rather than as a food crop, whereby millet, sorghum, and fonio are the staple foods (Ember 2001). Despite some progress in this respect, Mali is not yet self-sufficient in its cereal supply: In 2008, 10 per cent of the rice consumption was imported.

Cereal processing is done in three stages: The first one includes the husking of rice, millet, sorghum, and fonio and the milling of maize and wheat. The second stage includes pre-cooking, especially of millet and sorghum. Dèguè is the most important second stage product (constituting roughly one quarter of all second-stage transformed cereals), followed by couscous, monikuru, and precooked fonio (LTA / IER 2005). Third stage transformation includes the preparation of flat bread, tacoula, didégué, and mugufara as well as liquid and semi-liquid porridges (moni, seri; tô) as ingredients for domestic cooking.

Besides two larger companies, a considerable number of small enterprises operate as contract processors (customers bring grain to be milled) along with a multitude of second and third stage transformers. Nearly three quarters of Mali’s agro-alimentary businesses are cereal transformers (LTA / IER 2005).

Although wheat is not a major crop, contributing only 2 per cent to the total cereal production, it has gained some relevance due to an increased consumption in the cities. Of a total wheat flour consumption of approximately 70,000 tons in 2008, one half was imported in its non-processed form, whereas one third was imported as flour (mainly from Senegal, Côte d’Ivoire, and France). Thus some untapped import substituting market potential exists. The substitution of imports of flour for locally milled wheat might provide employment for 550 workers. One of the main problems, however, is that due to impurities locally produced flour is considered of lesser quality compared to imported flour. Furthermore, any promotion of wheat should consider the fact that the nutritional value of white wheat flour is lower than that of unmilled
indigenous grains (millet, fonio). In addition, the production of millet and fonio has a more equalizing effect on income distribution among farmers than the production of wheat, which requires relatively larger non-labor inputs.

Sugar refinery

Mali’s sugar production is mainly derived from sugar cane farming in the irrigated Office du Niger zone. The annual raw sugar production is around 32,000 tons, while net imports are around 106,000 tons. With an average sugar consumption of only 11 kg per year (as compared to 34 kg in the EU or even 58 kg in Brazil) there is still a large market potential. It is estimated that in Mali a 1% increase in income will result in a 0.9% increase in sugar consumption (Couara 2004).

Presently, sugar is traded under government control, i.e. retail prices are fixed. Its import is licensed to only a few trading companies (although their number has recently been slightly enlarged). Although the West African Economic and Monetary Union (UEMOA) applies a Common External Tariff (CET) which, following an escalation pattern, should, in principle, be 20 per cent for consumer goods, additional tariffs are applied for sugar. The actual import duties are estimated to be 48 per cent (LQB, 06/10/2009). Given the differences between the CET and the actual tariff, smuggling of sugar is widespread and in contrast to the government’s intention of higher protection actually undermines Mali’s sugar production.

In the long run, the Malian government wishes to promote sugar production by attracting foreign investment in sugar cane farming and the construction of new sugar factories both to meet local demand and export the surplus to regional and European markets (Embassy 2010). However, whether in addition to the new 190,000 tons Markala sugar project there is that much scope for new investment targeting the national market, and whether sugar production in Mali is competitive on the international market remains to be proven. On the other hand, it has been possible to export sugar confectionary produced in Mali to neighboring countries, mainly Guinea. Considering this fact, processing sugar to confectionery could be an opportunity for further Malian enterprises.

Fruit, vegetables, and tobacco

Fruit and vegetable processing in Mali includes desiccation as well as transformation into juices, syrups, and confitures. Production units in fruit and vegetable processing are mostly family-based and informal.

Traditional open-air desiccation includes onion and shallot, tomato, pepper, and gombo. More advanced techniques of shallot desiccation established under the impact of development projects (Dogon plateau, Office du Niger area) reduce damages from impurities and vermin.
The practice of mango and vegetable-leaf desiccation has only recently been introduced in the Sikasso and Koulikoro regions (LTA / IER 2005). Indigenous West African food plants which are processed include jujube (*Ziziphus mauritiana*) and néré (*Parkea biglobosa*). Jujube is processed to snack foods. Néré seeds are processed by boiling, cleaning, and fermenting to the popular condiment soumbala. As néré seeds have become short in supply, substitutes include soumbala made from other kinds of seeds, such as soybeans, as well as imported bouillon cubes, which, however, lack the proteins and essential minerals of néré-based soumbala. The processing of néré is considered to be highly profitable, but access to peeling machinery is a bottleneck.

In the 1990s, tomatoes were also processed on an industrial level by a parastatal. It produced 3.2 tons double-concentrated tomato puree but finally failed due to sales prices lower than production costs, an insufficient production capacity during the time of the tomato harvest, and consumers’ demanding imported triple-concentrated puree (L’Essor, 14/04/2003).

Juices, syrups, and confitures are produced with mango, *dah rouge* (*Hibiscus sabdariffa*), ginger, and tamarind as the main ingredients. Furthermore, *zaban* (*Saba senegalensis*), guava, and *tabacoumba* (*Detarium microcarpum*) are processed, albeit on a much smaller scale. The small transformation units mostly lack the production and quality-control equipment necessary for an extension of production quantities and for a constant high quality. Only a few enterprises can be considered as producing near or at industry-level. They are reported to produce soft drinks only on the base of imported fruits and aromatic extracts. For the majority of the Malians these products are considered luxury goods (LTA / IER 2005).

Exclusively based on the very few large firms, exports of non-alcoholic beverages increased recently. Export destinations were Guinea (70 per cent) and Côte d’Ivoire. So far, processed fruits and vegetables have not been exported on a relevant scale. Food safety standards are a major constraint.

Tobacco consumption is estimated to be 2.5 bn cigarettes per year. The only tobacco-producing company in Mali, privatized in 2002, has a production capacity of 2 bn cigarettes, but is utilized far below its capacity (L’Essor, 26/01/2009) leaving tens of thousand of tons of raw tobacco unused. Illegal imports are a main competitor.

**Cashew nut processing**

Cashew trees are planted in a number of districts around Sikasso and Bougouni, along Côte d’Ivoire and southern Burkina borders; a secondary production area based on old trees is located around Koulikoro. Besides labor and land, few inputs are used, occasionally some insecticides (ACA 2007). The cashew trees bear the nuts and the apples. The latter ripen earlier than the nuts and for this reason and due to their juicy
pulp and fragile skin they are unsuitable for transport. However, they can be used for syrups, juice, or marmalades.

Approximately 12,000 small-sized farms produce an average of 3,500 tons of raw cashew nuts per year (MEIC / DNCC n.d. a) along with some 120,000 tons of cashew apples. Being harvested from February to April, working-time allocation to cashews does not compete with main crops. The trees also help to stabilize results from other crops, as their tolerance against occasional droughts makes them instrumental in reducing soil erosion. For many Malian farmers, cashew nuts are the only source of cash income.

Raw cashew nuts have to be processed to edible kernels. This is technically not trivial due to the fact that the nutshell contains toxic oil (cardol), which has to be neutralized by way of roasting or water-damping. With the exception of a few micro-operators located in Bamako with a total production capacity of less than 0.1 per cent of the harvest and producing for retail in Bamako (ACA 2007), almost all nuts are exported to India for final processing (UNCTAD 2007).

As cashew nutshell liquid is mostly composed of anacardic acids, processing cashew could provide scope for downstream industries, both pharmacological and cosmetic. The present Malian production, however, may be too small to meet the minimum efficient scale of processing standard qualities for competitive international markets. An alternative is to exploit economies of scale by cross-border co-operation or to produce only for the premium segment of the final consumer market by applying a suitable processing technique, such as the newly developed, labor-intensive Indonesian cold state cashew shell-opening (Agropress 2006).

The international marketing of organically grown cashew kernels could be facilitated by the fact that chemical inputs to production are already low – even if the present low quality of the bulk of the nuts from Mali constitutes an impediment for this option which cannot be overlooked (MEIC / DNCC n.d. a). Finally, cashew apples also have a still largely untapped potential to be processed to durable products, both for domestic consumption and for exports.

Shea nut processing

The West African shea (karité) tree grows naturally in the dry savannah belt. Grinding and cooking its fat-rich nuts allows the separation of oil from shea butter. Usage includes a wide variety of fields, such as nutrition, soap, and cosmetic and pharmaceutical skin care. Shea butter can also be a substitute for cocoa butter in chocolate. Unfortunately, a targeted production of shea nuts is difficult: New plants often only randomly germinate and a tree’s full yield capacity is reached only after approximately 50 years.

Mali’s production of shea nuts in 2008 was 190,000 tons, i.e. 24 per cent of the world production, second only to Nigeria (52 per cent). Estimates are that Mali presently
makes use of only two thirds of its production potential (LTA / IER 2005). This is even more extreme in exports: In 2003, Mali exported but 4,000 tons raw shea nuts (i.e. 3 per cent of total African exports) in addition to 5,000 tons of shea butter.

Collecting and processing shea nuts provide seasonal employment and cash income for about three million Malian women (whereas traditionally men do not engage in the shea nut business). The main constraints for an increased collection are that, as the shea trees are widespread, collection is only small-scale, in a radius of a few kilometers around the village, and that shea nut collection is in time-competition with other work obligations for women during the rainy season (June to September).

Transformation of shea nuts to shea butter is usually organized by groups of women. In addition, there are three industrial enterprises processing shea nuts in Mali. However, all three enterprises have always been far below their production capacity, both due to the insufficient quantity and quality of the raw material (LTA / IER 2005). Furthermore, in household-based processing the constraints include the unpredictability of product quality in addition to a low processing technology, an excessively long chain from producer to market, i.e. the inclusion of various levels of intermediaries, and a lack of market information (MEIC / DNCC n.d. b). Constraints on the domestic consumer side can be seen in imported cheaper substitute products with a higher prestige, reflecting the lack of consumer awareness of the nutritional value and therapeutic attributes of shea.

In the past, various development projects aimed at increasing both the quality and quantity of shea butter production in Mali by introducing mechanical presses to small-scale production units, but were mainly unsuccessful mainly due to the arduousness of work involved for the women (LTA / IER 2005) More recently, a number of initiatives, such as an UNIDO food processing pilot centre, have targeted the marketability of Malian shea butter (UNIDO 2007).

Given the fact that the shea tree’s occurrence is limited to Africa alone, shea provides a unique competitive advantage for Mali. It should be pointed out, however, that due to the botanical specifics, the potential of shea processing is limited and cannot be extended in the short to medium term.

**Strengths, weaknesses, opportunities, and threats**

**Strengths** of Mali’s agro-industrial sub-sector include low unit labor costs in the textile industry, a large livestock population, a large freshwater fish producer, a large potential market for special cotton fabrics (booboo, pagne), and quasi-monopolies of African producers (unique selling points): néré, cashew, shea.
Weaknesses include a low standard of animal health, a low quality of leather, a low and/or unpredictable quality/quantity of raw material, such as cashew nuts and shea, difficulties to meet minimum efficient scale in areas such as standard cashew processing, a low level of bacteriological quality in smaller milk processing units, a low level of technology in the textile industry, the lack of appropriate machinery such as in néré peeling, leather processing, cashew and shea, transport impediments, such as for fresh fish and cashews, the lack of adequate packing for processed food, insufficient domestic purchasing power for soft drinks, and import competition (condiments, wheat flour, oil).

Threats include environmental damages of cotton production, the comparatively low level of economies of scale to be exploited in textile industry, the upward trend of F.CFA vis-à-vis the USD, the dumping of second-hand clothes (friperie), overfishing, and the employment reduction by efficiency enhancing techniques in fishing.

Opportunities include the national marketing of fish, export of hides and skins and tanned leather, production of condiments based on néré, a domestic market potential for sugar and confectionery, processing organically grown cashews with labor-intensive techniques and marketing kernels internationally, processing of cashew apples to marmalades and juices, the international marketing of shea butter, shea-based soap etc., and upgrading the textile industry by foreign direct investment.

Policies affecting agro-industrial development

Policies affecting agro-industrial development in Mali include reforms of the economic system, macroeconomic, sector and regional policies, as well as the interaction with the private sector, especially industrial policies for specific value chains.

(1) After independence, state-owned enterprises hold monopolies in almost all the country’s economic activities. Since 1988 the government carried out a comprehensive privatization program. By 2000, in the agro-industrial sector the government was still the majority share-holder in CMDT (Compagnie Malienne pour le Développement des Textiles), i.e. the main player of the cotton sector from seed to export, as well as in staple food distribution, slaughterhouses, and tobacco processing, and a minority share holder in textile companies, oil and soap production, canning, and sugar refinery (Keita 2000). By the beginning of 2010, apart from slaughterhouses, CMDT was the only state-owned enterprise remaining – and it seems that although it is presently difficult for the government to retreat from intervention in this central sector of the Malian economy, nevertheless authorities are still committed to privatizing CMDT (MEF 2009).

(2) Mali is one of the Heavily Indebted Poor Countries (HIPC) and is a major recipient of foreign aid from many sources, including multilateral organizations. The total debt
outstanding was USD 1.4 bn in 2006, mainly official bilateral and multilateral. The IMF praises Mali for its “sound macroeconomic policies” (IMF 2010): The target figure for the basic fiscal deficit for 2010 is 1.6 per cent of GDP. Although still running huge current account deficit, buoyant gold exports have led to a greater-than-projected improvement. Annual inflation is remaining at low levels, 2.1 per cent.

(3) To support agriculture, the Malian government has resumed the practice of subsidizing inputs first in the rice sector (under a “Rice Initiative”), and then extending it to the support of wheat, maize, and cotton. The subsidies are meant to be limited in time and volume, and annual budgetary cost shall not exceed an amount equivalent to 0.5 per cent of GDP in 2009 and 2010 (MEF 2009). The Malian government’s development program is laid down in the Poverty Reduction Strategy Paper (PRSP). Inter alia, it aims at creating 10,000 new jobs per annum in the formal non-agricultural sector (AsDB 2005). In addition, the Malian government is committed to accelerating the decentralization process within the framework of an institutional development plan, which was adopted in 2004 (AsDB 2005).

(4) In 2007, Mali was ranked 74th out of 141 countries in the UNCTAD’s Inward FDI Performance Index (which ranks countries by the FDI they receive relative to their economic size), and 123rd out of 141 in the Inward FDI Potential Index (which identifies several factors apart from market size expected to affect an economy’s attractiveness to foreign investors) (UNCTAD 2009). A comparison between these two rankings reveals that Mali is above its potential. However, the figures are distorted as foreign investment is concentrated in mining and trade, while the manufacturing industry is only marginally targeted. Although legal barriers for FDI are small, including the fact that foreign investors may have full ownership of any new business according to the Malian investment code (UNCTAD 2006), the country is ranked only 153rd out of 183 countries in the Doing Business 2011 Report (World Bank 2010), pointing to the fact that there is still a long way ahead.

According to a number of studies summarized by AEO (AEO 2009), principal constraints include: a weak legal and regulatory framework (including a high level of corruption) and poor support for business despite the existence of a host of institutions mandated with their development; an inefficient judiciary system with little credibility; a complex tax system; the almost non-existence of business support services, along with the high prices charged by the few existing ones; and the lack of qualified labor.

With respect to the labor force it should be mentioned that there is a “missing middle” in the qualifications available in the labor market, i.e. given a huge amount of unskilled labor and a number of university graduates especially in non-technical subjects much too large for the country to be absorbed in productive employment, the
number of qualified technicians is very limited. Among 85 countries, Mali (along with Afghanistan) had the least equitable distribution of education in the 1990s (World Bank 2000, p. 59). This states the case for a re-organization of the educational system towards enhanced vocational training, which would also promise huge benefits for the agro-industry sector.

(5) Promotional activities for the agro-industries include a multitude of organizations, projects, and programs aimed at promoting new processing technologies, improving the technical and organizational infrastructure, the dissemination of market information and the participation in national and international trade fairs. More research will be needed to assess the sustainability of these endeavors, many of which do not seem to be continued beyond the actual project durations. Given limitations due to the insufficient availability of trained personnel (evident from the extremely high wage premium on employment with international organizations vis-à-vis employment in the private business sector), the absorption capacity for project funds also seems a common problem.

However, from the point of view of the SWOT analysis of the agro-industry sector provided above, more emphasis seems to be necessary on the following factors.

Supply side factors:

■ improving the quality of raw materials, especially improving animal health, and the purity of storing and processing (milk, cereals, vegetables, fruits and nuts) by setting and enforcing universal health and hygiene standards;
■ upgrading the processing technology in compliance with the relative scarcity of factors of production, i.e. targeting the application of devices suitable for a labor-abundant economy (e.g. in the cases of fishing and cashew kernel processing, imported machinery is typically labor-saving) by providing targeted micro-credits and encouraging the dissemination of appropriate technology via technical training courses;
■ reducing additional production costs which result from the relative backwardness in infrastructure, such as the particularly high costs for electricity, by moderate state subsidies;

Demand side factors:

■ promoting national demand by redistributing income to the rural poor (whose demand structure is both geared towards products which are less import-intensive and more labor-intensive products than the goods demanded by the urban middle class) inter alia by a stronger de-centralizing of government-supported economic development initiatives;
■ promoting international marketing by providing credit-based access to quality control devices and appropriate packing, all supported by a (“Korean style”) mechanism linking future export assistance to previous export performance;
■ enhancing the non-price competitiveness of Malian products on international...
markets by umbrella brand initiatives especially in niche markets such as organically grown / fair traded cotton and processed food, ethnic food including spices and ready-made dishes, ethnic and / or organic cosmetics, and the establishment of a "West African apparel brand" with the help of marketing promotion agencies on the basis of locally produced fabrics to harness the creativity of Malian textile designers.

References

Embassy of Mali to the United States of America (2010), Website, www.maliembassy.us [retrieved 2010-01-02].
Le Quotidien de Bamako (06/10/2009), Démonopolisation de l’importation du sucre: L’Etat veut soulager les maliens!
L’Essor (14/04/2003), Une seconde vie pour la SOMACO?
L’Essor (18/04/2006), Campagne de pêche 2006: priorité au développement de la pisciculture.
UNCTAD (2007), Cashew nuts: South-south trade and the processing dilemma, wwwunctad.org.
Databases: FAOSTAT, COMTRADE, ICDS.
Introduction

In the past years there has been an increase in what one reads in the literature concerning the concept of two-sided platforms. These are platforms in which two (or more) groups of consumers come together and gain utility because of their interaction with each other. A classic example of this is a heterosexual dating agency, which needs both women and men to work. Women only benefit if men join the agency and vice versa. The agency must bring both consumer groups “on board” to function properly. The implication is that the dating agency needs to take these externalities into account when setting prices for these two groups. The theoretic framework for this is laid in Roche / Tirole (2003 and 2006) and Armstrong (2006). Applications and criticisms can be found in Wright (2003) and Roson (2005).

Recently this concept of two-sided markets has been applied to the airport business. It has been said that airports must bring together passengers and airlines in order to work. Gillen (2008) was one of the first to mention this connection explicitly and stressed some implications and fallacies that result from the application of the two-sided market concept for airports. Furthermore, as Morrison (2009) argues, airports factor the revenue streams from their non-aeronautical activities into their pricing decision. It is argued that because of the complementary relationship between aeronautical and non-aeronautical revenues airports bring together passengers and airlines and thus function as a two-sided platform.

This article will critically assess whether airports really are two-sided platforms, whether the concepts can be applied, and
whether it matters from a policy perspective.

Airports as two-sided platforms?

Obviously it is very tempting to assert that airports are two-sided platforms. As stated in the introduction, airports bring together passengers and airlines. Passengers are attracted if they are offered a large number of destinations, frequent flights, choices of different airlines, convenient schedules and so on. Airlines, on the other hand, are more likely to pick an airport as a point of operation if a lot of passengers can be attracted to fly to and from that airport.

Roche and Tirole (2003) define two-sidedness in such a way that the volume of transactions (output) fluctuates if the price structure (relative prices between the two groups) changes whereas the price level (defined as the total revenues from both sides of the platform) remains unaffected. If that does not hold true the market is said to be one-sided. It is not uncommon in two-sided market that one group will pay a zero price and only the other group has to pay for the product.

However, there is a difference between not having to pay for something and not getting sold something. In the case of airports, passengers pay no entry fee because they are not getting sold anything by the airport in relation to the aeronautical product, i.e. in relation to the actual flight. As Evans and Schmalensee (2007) point out in their definition of two-sided markets, a platform arises in situations where there are externalities that the two parties could not have solved differently (or with lower transaction costs) than by using the platform as means of exchange. It is important to point out here that the platform sells both parties something that enables them to “come together” and to interact. With airports, this is not the case. When a passenger arrives at the airport to check-in, usually the ticket is already purchased. The airport is not actively seeking to bring airlines and passengers together. Either the airlines already have a connection to the consumer (e.g. through their website) or a ticket agent or online search and booking machines have brought airline and passenger together. (In this case the ticket agent really is the two-sided platform.) The airport is merely an input for the airlines. Notwithstanding it is an essential input, as the airport enables aircraft to land and organizes passenger flows on behalf of the airlines. Hence, the relationship between passengers, airlines and airports is purely vertical. The only reason why airports might charge passengers directly in relation to the aeronautical product is when they charge passengers instead of airlines for any passenger-related handling activities.

If, for example, the airlines no longer pay the airport for passenger handling processes but passengers have to pay themselves for being processed through to their aircraft instead, then, in this case, the basic vertical relationship remains the same, but the connection turns more into what Evans and Schmalensee (2007) call software platforms. Software platforms, like Windows or Apple,
or videogame console developers are said to bring software developers and end-users together, just as the airport is said to bring passengers and airlines together. Yet that assessment fails to recognize that, from the consumer’s point of view, the products are what can be called perfect complements. In these cases, the consumer is forced to buy the input himself before buying the product that is actually consumed. Stated differently, the connection between the alleged platform and software developer is not independent of the connection between developer and end-user, i.e. the connection between the two customer groups of the alleged platform. Take, for example, a scenario in which consumers have to buy razors and razor blades from two separate companies but the razor company holds patent rights for the blade system. They charge for the razors and receive license fees from the blade producers. That kind of arrangement does not make the blade producer a two-sided platform. The reason is that the product the razor producer sells to blade producers is not to enable blade producers and end consumers to come together. For the blade producers, the license is merely an input factor. The costs for this input factor are (partly or completely) passed on to the consumers, which cannot happen in two-sided markets. Going back to the example of the dating agency, imagine that there was a partnership established and men were to find out that they had paid more than their new partners. If men demanded compensatory payment from women, both parties could internalize their usage externalities ex-post, thereby circumventing the platform’s pricing scheme.

In setting their prices, both blade and the razor producers must recognize that they sell complementary products. Whenever blades are bought, the need to purchase a razor will be anticipated and is therefore ex-ante internalized by the consumer. The firms’ price setting rationale must consider the vertical relationship between the razor and razor blade departments and the complementarity between their products. Two separate firms would have to act in a similar way, the only difference being that coordination might be more difficult and more than two firms might be involved. About the same would be true if airports simultaneously charged passengers and airlines. In this case, passengers and airlines would be required to buy the input factor “airport”. However, there are no externalities (other than vertical externalities) present in this case. From the consumer’s view, the decision to buy the input “airport” is already reflected and internalized by the decision to buy an airline ticket and thus the demand function for airline tickets already reflects the demand for the input “airport”.

The role of non-aeronautical revenues

So far it has been argued that airports are not two-sided markets, but that the relationship between airports and airlines is purely vertical. Any externalities that may arise are resolved or remain unresolved within this vertical structure.
Yet, additionally airports usually sell various non-aeronautical products to passengers, such as food and beverages or clothes. Viewed that way, could the airport be a two-sided platform?

Starkie (2001) discussed quite early the relationship between the two business streams, although he never explicitly argued that the two products are complements, rather that there are complementary revenues. Yet, the real question in the context of this section is whether this connection is an example of a two-sided market. Here again one must go back and look at the underlying utility function. When speaking about aeronautical and non-aeronautical products, one must be aware that the former product is demanded by passengers who don’t shop and the latter by those who do. Hence, the group of consumers is changed. Passengers who don’t shop simply come to the airport to fly, whereas the passengers who shop also buy at the airport. Once a passenger decides to shop, this is done not for the sake of flying, but for the sake of shopping. Therefore, one moves to another utility function. There is obviously no relation between airlines and passengers who shop. Airlines do not benefit from the presence of passengers who shop and passengers who shop do not gain from having a larger range of destinations and airlines at the airport. Thus the utility function does not exhibit any cross relationships between the two groups. Moreover, the aforementioned definition by Roche / Tirole (2003) does not apply. Even if the aeronautical output increased if the price of non-aeronautical products was lowered and the overall price level between the two was kept constant, it still does not prove two-sidedness because the outputs are different (passengers who shop and those who don’t).

Discussion and policy implications

Considering the standard economic model of a multi-product monopolist (see for example Lipczynski et al., 2005), it can be seen that depending on the cross-price elasticities and economies of scope there might be an incentive to charge a price for one of the products below what would have been charged for the product compared to a situation in which only one product was sold. It could (theoretically) even be the case that one product is priced below marginal costs or even at a negative price. The same could therefore be true for airports and their aeronautical and non-aeronautical products. If there are scope economies and the main impact of the income effect works in such a way that a price decrease in the aeronautical product boosts non-aeronautical demand more than a price decrease in the non-aeronautical product would boost demand for the aeronautical product, there is an incentive to charge a lower price for the aeronautical product and a higher price for the non-aeronautical products. In other words, under the appropriate cost and demand assumptions, there would be an effect just as Starkie (2001) described, which means that there would be an incentive for the airport to lower the aeronautical prices (below the normal monopoly level) in order to boost non-aeronautical revenues to maximize profits.
Earlier this paper argued that externalities might arise since airports and airlines are within a vertical structure. The downstream airlines pay charges to the upstream airport for the provision of infrastructure and passenger and baggage handling processes. Just as in any vertical structures this can give rise to double marginalization problems (cf. Rey / Vergé, 2008). This problem arises because both the up-and-downstream levels maximize their profits individually instead of jointly. Compared to a situation with a vertically integrated monopoly, in the non-integrated case final consumer prices would be lower and quantities larger. Ideally, the airport would charge a price that is equal to its marginal costs, but since it sets its price above marginal costs – although the aforementioned complementarity effects could lessen and theoretically offset this effect – the downstream airlines receive a price that sends the wrong incentives concerning their own price setting. The outcome is bad for airports, airlines and the consumers. Furthermore, efforts to increase demand by one party will also be beneficial for the other party, but the former will receive no compensation from the latter. One might think of an airline at a particular airport increasing its quality, network or reliability. If so, then more passengers are likely to use that airline and consequently more passengers use that airport, which will experience a windfall in profits (also through non-aeronautical revenues). Yet, the airline receives no compensation for its efforts from the airport.

The implications for policy are that non-aeronautical revenues are important and should be taken into account concerning price regulation of airports. If, for example, only aeronautical revenues are subject to price regulation (and non-aeronautical revenues are not), this could have a detrimental effect on non-aeronautical prices, which might increase in the process and thus lead to distortions in demand. On the other hand Starkie’s (2001) argument might be valid that price regulation is not at all warranted because the incentive to lower aeronautical prices might suffice for airports not to exploit their market power. This would be true for airports with big non-aeronautical demand and strong cross-price elasticities between aeronautical and non-aeronautical demand. With respect to the vertical constraints of airports, it should be kept in mind that in a free market environment the up- and-downstream parties would have incentives to find optimal price structures (such as two-part prices) on their own. In the case of airports, the usual practice is to have ex-ante posted, aircraft weight based landing charges, which are not able to avoid, for example, double marginalization. However, this business practice is changing. At Sydney airport, for example, light handed regulation has enabled the airport to change its pricing policy drastically and it now strikes individual and secret contracts with the airlines operating at that airport (see, for example, Schuster, 2009). Yet there are more and more airports that use contracts and negotiated prices as their dominant business practice to cooperate with
airlines. Regulatory schemes should enable airports and airlines to find optimal price structures that help vertical coordination and oversight should prevent restrictive and abusive behavior.

Conclusion

Problems that arise in vertical structures, such as double marginalization, are usually solved differently from industry to industry and, for example, non-linear tariffs are not uncommon. In the airport industry the practice has become to strike individual deals with airlines that establish the terms of use and the pricing system, which may include two-part prices (see Schuster, 2009). Airports and airlines should be allowed to find their own ways to internalize the vertical externalities that arise because of their business activities. Restrictive price regulation as well as public ownership that is not geared towards commercial practices potentially hinder such vertical coordination strategies.

Furthermore, it was argued that the connection between aeronautical and non-aeronautical activities is not an example of a two-sided market. The implications from the standard model a multi-product monopolist are very similar, if not identical, to those by Starkie (2001) and Morrison (2009). They argued that profit maximizing airports have a built-in tendency to lower the price for the aeronautical product below the point they would have charged in the absence of the connection to the non-aeronautical side of the business. This paper pointed out that this is only achieved under certain assumptions (complementarity effects must work strongly in one particular direction and/or strong economies in production must be present) and that the scope of this effect could be different from airport to airport (depending largely on the demand parameters). Although aeronautical and non-aeronautical activities of airports are not an example of a two-sided market, the connection between the two still has similar effects and has implications regarding the pricing of the two products.

The concept of two-sided markets does not seem to enrich the discussion regarding airport regulation and competition. Yet, the connection between aeronautical and non-aeronautical activities and the vertical coordination effects do matter and they matter in a way that is quite similar to what a two-sided market analysis would have concluded if it were applicable, yet the concept itself is not needed for analysis. Instead the tools needed to analyze airport economics are already at hand, but they need to be applied in a correct manner. The arguments brought forward in the previous section indicate that the need for regulation can be very case-specific and should take into account vertical coordination effects.
Acknowledgements

The author would like to thank Julia Hellmers, David Starkie, Bernard Wieland and Hans-Martin Niemeier for valuable comments and suggestions on earlier drafts of the paper.

References


Vietnam faces problems stemming from (1) air pollution, (2) traffic accidents, (3) traffic related congestion, (4) inconsistent policy and (5) policy with adverse effects.

Rising urbanization has led to greater population density in Vietnam. Coupled with rising motorization air pollution, in the form of ozone, TSP and PM10, has risen. Rising air pollution in turn has adverse effects on health. A high concentration of vehicles in urban centers leads to a high concentration of air pollutants. This in turn contributes to a rise in respiratory disease occurrences, severity and persistence. According to the World Bank, PM10 emission rates for Vietnam exceed German emission levels by two-and-a-half times (Vietnam: 55, Germany: 19). Motorization rates in Germany, according to the World Bank, are slightly higher in aggregate, as defined by vehicles by 1000 persons, but according to Emberger et al. (2008) the difference is not only quantitative, but qualitative. Motorization in Germany primarily encompasses cars, while motorization in Vietnam encompasses primarily motorcycles.
Another serious problem highlighted in the literature is the prevalence of traffic accidents in Vietnam. Up until 2007, according to the World Health Organization (WHO 2010), Vietnam did not have helmet wearing requirements for motorcyclists. In 2007, a law was implemented, accompanied by heavy advertising and enforcement efforts. Growth of traffic related accidents has since stalled. A high concentration of drivers contributes to congestion during peak commuting hours. The Government of Vietnam has sought to address the matter by restricting motorcycle usage, but the measures have been considered a failure by the Asian Development Bank.

Transport policy for road transport can be described in parts to be inconsistent. Policy makers have made exceptions for motorcyclists (the majority of road users), while seeking to regulate car. This has served to contradict the base aims of the government. As of 2007 cars are supposed to be subject to fuel and emission standards comparable to EURO-2 norms. Motorcycles appear to have been exempted from this. Given that Vietnam has a much greater share of motorcycle users (approximately 500 per 1000 persons) than car owners (13.5 per 1000 persons) the policy is unable to accomplish what it is meant to, namely contribute to better air quality and fuel usage.

An example for adverse policy maker behavior and capability restraints would be fuel quality in Vietnam, which is tied to fuel economy and emissions. Vietnam imports cheap, low grade foreign fuels and exports high quality sweet crude oil, because Vietnam lacks the capabilities to refine its sweet crude. According to Vietnamese Vehicle Manufacturers Association (VVMA) cheap fuel hurts vehicle engines. Low grade fuel also provides worse fuel economy and contributes to greater vehicle emissions.

The main problem for inland waterways is neglect on the part of government by way of under-funding and under-prioritizing. Vietnam could shift some of its human and material traffic flows onto inland waterways, but the possibility has largely not been pursued. At present the priority for the government of Vietnam is to upgrade loading facilities along its main rivers. Inland waterways could be used for feeder traffic in the form of commuter ferry services freight transport by boat, but that would require greater investment into this particular mode of transport.

Rail transport in Vietnam largely focuses on North-South transit between Hanoi and Ho Chi Minh City (HCMC). Smaller regional rail links are said to exist, but metropolitan rail transport has not been realized as of yet. Currently, a metropolitan rail transport project is being considered for Hanoi, aided by the French government.

Town planning problems

Key problems faced by Vietnamese cities are (1) infrastructure related problems, (2) communal waste management and (3) slums.
The high concentration of urban vehicles contributes to rapid road infrastructure degradation. Municipal waste management is unsafe and not sustainable. Sewage systems are aging and in need repair and expansion. Air and water pollution is prevalent. Municipal waste management is unsafe in terms of unchecked dumping. Waste management facilities are not setup in a manner that addresses potential groundwater contamination. Groundwater contamination in turn may contribute to water borne skin and respiratory diseases.

Another issue faced by municipalities are slums. According to UN Habitat, growth of urban areas (app. 3 per cent per annum) exceeds the growth rate of slums (app. 1 per cent), but estimates a slum-to-urban ratio of 47 per cent. Slums are characterized by reduced access to safe drinking water, durable housing and sanitation, as well as a host of social problems such as potential for crime.

The main challenge for municipalities, aside from managing traffic flows and congestion, is infrastructure investment. Infrastructure at present is primarily funded by municipalities. Sustainable municipal planning must address funding issues by seeking to improve access to non-government (here: central government) funding.

Institutional problems

The present planning process in Vietnam is mostly characterized by a top-down approach, wherein the central government sets policy and goals and delegates the implementation to lower levels of government. According to the World Bank (2006) the planning process in Vietnam is reminiscent of wish lists. Each agency puts forward a range of desired projects, which then are either granted or denied funding. These lists do not necessarily reflect the needs of the agency. Agencies compete for funds. The agency that attracts the most funds holds the greatest relative prestige.

When funding reflects desires rather than needs agencies may not be adequately funded, either under- or over-funded. Funds may not be optimally allocated. The World Bank further cites weakness on the part of Vietnam in implementation. Policy may be determined by the central government, but implementation is left to lower levels of government. This ties in with coordination and information related problems. This also applies more directly to ongoing government projects. Lack of oversight, accountability, reporting and intervention, when and where needed, contributes to time- and cost overruns.

In terms of funding Vietnam spent 4.5 per cent of its GDP on transport between 2001 and 2005, which is a comparatively high percentage by international standards (2 to 3 per cent). The majority of these expenditures (> 80 per cent of total) were spent on road transport, more specifically on the building of new roads. One may safely conclude that the Government of Vietnam exhibits a mode bias, in the form of preference, toward road transport.
Inland waterways (IWW) did not receive funding proportionate to their potential significance (less than 5 per cent of total government expenditure on transportation).

**Natural hazards**

Vietnam suffers from a number of natural hazards including typhoons and floods. Vietnam’s coastal areas, particularly the low land south are particularly prone to flooding and by extension to storms. An estimated 70 to 80 per cent of the Vietnamese population lives in lowland areas that may be affected by flooding. Flooding, when it occurs, carries economic as well as human consequences. In economic terms flooding damages housing and road infrastructure. Research seems to indicate that all-weather roads are not common, but substantial data is not available and therefore the claim cannot be confirmed.

**Perspectives**

Vietnam currently finances its expenditures on transport through government revenues and official development assistance. The World Bank and the Asian Development Bank view this method of funding as unsustainable and recommend drawing on private sector stakeholders, i.e. the business community and the population for funding assistance. Involving stakeholders may increase public support of government strategies, when these broadly overlap with the interest of the public and the business community.

**References**

Benchmarking of Utilities for Performance Improvement: The Case of Airports
by Vanessa Liebert

Introduction
During the last four decades, an upward trend in international tourism and globalization substantially increased traffic rates in the aviation sector. Several shocks (Gulf War, Economic Downturn, terror attacks in 2001) temporarily interrupted this trend, however have not affected an overall growth. The major influence of this growth has been the deregulation of the airline industry in the late seventies which was the starting point of a gradual liberalization process in the aviation industry. The opening of the aviation market increased competition of a previously restricted airline industry. Consequently, airports feel exposed to the cost pressure and are constrained to operate efficiently.

In short, the airport industry evolved to a dynamic market environment. Increasing commercialization, privatization and restructuring processes, a shift towards incentive regulation and advanced technologies changed the nature of the airport industry and contributed to productivity and efficiency changes. Furthermore, the changing market structure may encourage airports to monitor the performance of nearby airports and other potential competitors in order to remain competitive. For this reason airports offer a rich field for performance comparisons commonly defined as benchmarking.

Quantitative approaches of benchmarking
Generally speaking, airports may be defined as a network that consists of multi-production processes. Aeronautical activities include the handling of passengers, aircrafts,
and cargo. The non-aeronautical side may operate car parking facilities, restaurants or retail. A number of quantitative techniques have emerged that assess the productivity and efficiency of decision making units (DMU). One-dimensional approaches are the simplest form to assess the productivity by dividing one output by one input. Being skeptical towards sophisticated overall quantitative techniques, airport managers mostly prefer partial productivity measures. However, this measure should be treated with caution. As discussed by Forsyth et al. (1986), partial measures should only be applied if data for overall measures is not available. Results obtained from partial measures can mislead as they fail to capture substitution effects between different inputs. In order to receive an overall picture of the airport’s performance multi-dimensional approaches should be applied instead.

Three well-documented quantitative methods have often been applied to analyze the productivity and efficiency of government and private enterprises. A non-parametric, index number approach has been used to measure the total factor productivity (Caves, Christensen and Diewert 1982a). The application of index-number approaches is most common in measuring price and quantity changes over time; the consumer price index (CPI) is the most popular economic indicator. However, in order to aggregate multiple inputs and outputs to an index, market prices are required as weights. Furthermore, the measurement of indices assumes that all units operate efficiently, which is likely to be untrue for airports that are influenced by external effects such as geographical and environmental constraints. Instead, frontier approaches are more appropriate to estimate an efficient production or cost frontier.

Parametric stochastic frontier analysis (SFA) assesses the efficiency utilizing econometric analysis. The parameters of a production or cost function are estimated utilizing regression analysis or maximum likelihood estimation. The model of the stochastic production frontier was first introduced by Aigner, Lovell and Schmidt (1977) and independently by Meeusen and van den Broeck (1977). It allows for a separation of the unobservable random error from technical inefficiency based on assumptions as to the distributional forms of the efficiency function and error term.

Based on the initial cross-section model by Aigner, Lovell and Schmidt, panel data model were proposed that allow for time-invariant and time varying inefficiencies (Pitt and Lee 1981; Battese and Coelli 1992). To further capture unobserved cross-firm heterogeneity which is not related to technical inefficiency Greene (2005) introduced an additional model to shift time-invariant effects to unobserved heterogeneity whereas the inefficiency term varies over time.

Observed heterogeneity such as geographical differences or ownership forms is integrated in the functional form, either assuming to affect the production technology or the inefficiency. Advanced models that account for different production technolo-
gies across units have recently been developed including the latent class model by Orea and Kumbhakar (2004) which clusters the data into different groups and then estimates the frontiers separately. Although SFA benefits from disentangling random noise from managerial inefficiency prior assumptions on their separation may heavily affect the results (Stone 2002).

Non-parametric data envelopment analysis (DEA) measures the relative efficiency of DMUs utilizing multiple inputs and outputs. DEA was first published in Charnes et al. (1978) under the assumption of constant returns-to-scale and was extended by Banker et al. (1984) to include variable returns-to-scale. With linear programming, it compares each DMU to the efficient set of observations, with similar input and output ratios, and assumes neither a specific functional form for the production function nor the inefficiency distribution. This non-parametric approach solves the linear programming formulation per DMU and the weights assigned to each linear aggregation are the results of the corresponding linear program. The weights are chosen in order to show the specific DMU in as positive a light as possible, under the restriction that no other DMU, analyzed under the same weights, is more than 100% efficient. Consequently, a Pareto frontier is attained, marked by specific DMUs on the boundary envelope of input-output variable space.

Over the years, the basic model has been continuously developed. Non-radial models remove restrictions to optimize inputs or outputs equi-proportionally. In order to rank efficient airports and improve the discriminatory power of efficiency estimates, Andersen and Petersen (1993) introduced the super-efficiency model where airports with rather unique input-output combinations receive excessively high rankings and are identified as outliers. A sophisticated approach to reduce the curse of dimensionality is principal component analysis (PCA) combined with DEA. PCA-DEA is applied to replace the original inputs and/or outputs with a smaller group of principle components (PCs), which explain the variance structure of a matrix of data through linear combinations of variables with minimal information loss (Adler and Golany 2001, 2002).

Panel data models assess productivity and efficiency changes over time. The most popular tool is the Malmquist index which was introduced by Caves, Christensen and Diewert (1982b). Utilizing DEA with distance functions the approach compares two adjacent time periods with each other. Different to econometric techniques non-parametric approaches does not allow for statistical inference. In order to examine the sensitivity of the estimated frontier bootstrapping, a re-sampling technique developed by Efron (1979), has been introduced to DEA by Simar and Wilson (1998, 2000).

Numerous studies explain efficiency differences across airports with factors beyond managerial control which is crucial for airports typically enjoying uniqueness. Among other factors, ownership forms, hub
or size effects and the location are assumed to substantially impact the efficiency results. Whereas parametric techniques integrate environmental variables in the production or cost function, DEA utilizes a two-stage approach where the first-stage efficiency estimates are regressed against a set of environmental variables in a second step in order to evaluate their significance. The advantage of second-stage approaches is that environmental variables are not included in the DEA model, hence not affecting the discriminatory power of the first stage. However, as with all parametric approaches, it may require the specification of a functional form.

Benchmarking of airports: a review of previous research

Within academic benchmarking a number of studies emerged since the late nineties to assess the productivity and efficiency of airports with DEA, SFA and index number TFP. To-date DEA proved to be the dominant application requiring neither prior assumptions on the functional form nor price information to aggregate multiple inputs and outputs. Common objectives of empirical studies are the examination of efficiency changes over time or aiming to explain efficiency differences with exogenous factors and thereby accounting for the heterogeneous character of airports. Especially the latter receives increasing importance in order to provide consistent efficiency estimates. Nevertheless, previous research indicates inconsistencies among the results thereby encouraging for future research.

The wave of airport privatizations in the past two decades motivated the assessment of its empirical effects however, as in other industries, the results were rather inconclusive (Megginson and Netter 2001). Parker (1999) utilizes DEA on the British airports owned by the BAA covering a period pre- and post privatization. No evidence is found that full privatization improves technical efficiency. In contrast, Yokomi (2005) reviews six BAA airports from 1975 to 2001 utilizing Malmquist DEA. As opposed to Parker, Yokomi find that the BAA airports exhibit positive changes in efficiency and technology as a result of the privatization.

The effects of ownership on efficiency have further been analyzed by comparing different ownership forms. Barros and Dieke (2007) analyze 31 Italian airports using DEA in the first stage and Mann-Whitney hypothesis testing in the second stage, revealing that private airports operate more efficiently than their partially private counterparts. Lin and Hong (2006) find no connection between ownership form and efficiency after analyzing a dataset of worldwide airports utilizing DEA and hypothesis testing.

Oum et al. (2006) assess a sample of 100 airports worldwide utilizing variable factor productivity and reach the conclusion that the productivity of a public corporation is not statistically different from that of a major private airport. However, airports with major public shares or multiple government involvement appear to operate significantly less efficiently than other ownership forms.
Very often, changes in ownership form are accompanied by changes towards light-handed economic regulation and restructuring processes. Consequently, changes in efficiency may be attributable to multiple explanations in addition to the change in ownership structure. Following Vickers and Yarrow (1991) privatization is not a universal solution and should not be separated from the economics of competition and regulation which are all determinants of corporate incentives.

Users of airport benchmarking

Although benchmarking was already applied in other transport sectors and regulated utilities in the nineteen seventies, it only became important in the airport industry twenty years later. Graham (2005) argues that the increasing interest in airport benchmarking is a result of the changes in ownership and the liberalization, commercialization and globalization trends which have influenced airport business growth, complexity and competitiveness.

The late interest may also be explained with the unique character of airports that challenges comparability. Some airports are heavily affected by factors that are beyond managerial control such as geographical constraints, weather conditions and political decisions. Furthermore, a heterogeneous mix of services is offered by airports. Some are highly integrated and offer handling services whereas other outsourced this activity to independent providers. In addition, the increasing importance of commercial activities may vary among the airports. Lumpy investments which are typical for airports complicate efficiency comparisons when airports are in different life cycles (Forsyth 2000). Nevertheless, following the Economist Peter Drucker ‘what you cannot measure, you cannot manage’ airport benchmarking received increasing interest by various airport stakeholders.

Airport benchmarking may be utilized for managerial purposes. Airport managers compare overall or partial processes such as ground handling activities with potential competitors or best-practice airports in order to develop new strategies. In order to avoid a comparison of apples and oranges, Frankfurt may include other European hubs such as Amsterdam, London-Heathrow, Paris or outstanding airports worldwide such as Hong Kong, Singapore and Dubai rather than nearby airports in their scope of comparison (Tretheway and Kincaid 2006).

Customers, shareholders and investors are interested in benchmarking as decision-making instrument. Airlines as the intermediate between airports and passengers prefer efficient airports at low costs and high service standards with low delays. Moreover, passengers prefer airports with low queue lengths that are located close to the city centre and are equipped with shopping and entertainment facilities. Private shareholders and investors expect high and rapid returns on their investments.

National and regional governments mostly assess the airports performance from an
economic perspective. They may examine the effects of policy changes, privatization or regulation processes. Further, to promote the region, municipalities need competitive airports to attract passengers and business opportunities (Francis et al. 2002).

Also known as yardstick competition, benchmarking may serve for regulatory purposes in order to compare the cost level of identical firms and determining the price of passenger and landing charges. The intention is to stimulate an airport to operate efficiently (Shleifer 1985). Whereas yardstick competition evolved to a standardized approach in the British water and railway industry it has rarely been applied to airports to-date (Reinhold et al. 2010). The Civil Aviation Authority (CAA) in the UK explains this reluctance with the heterogeneous character of airports and the challenge to find appropriate data (CAA 2000).

In order to improve the use of benchmarking and provide a valuable instrument for managers, governments, regulators and other stakeholders, academic research continuously aims to refine methods to assess the productivity and efficiency which will be outlined below.

Concluding Remarks

With the deregulation of the aviation industry, airport benchmarking became an important instrument for airports, customers and political institutions. In order to improve its application, a number of academic studies emerged during the last two decades.

However, the airport industry proves to be highly affected by external heterogeneities that are at least in the short-term beyond managerial control. Hence, meaningful comparison among airports proved to be a difficult task.

The aim of this paper was to discuss importance of benchmarking and its application to airports. The comprehensive overview of previous studies suggests a rather unclear definition of the inputs and outputs that define the production process to-date and may encourage airport stakeholders and academics for future research. The comparison of empirical findings may give recommendations to airport managers as on commercialization and restructuring (in particular ground handling); both proving to increase the airports’ efficiency.

Beyond doubt, airport benchmarking received increasing importance since the liberalization of the aviation industry and will remain an important instrument for airport regulatory purposes, managers and political decisions. However, communication between management, research and policy in the future is crucial to further improve the application of airport benchmarking.
References


CAA (2000), The Use of Benchmarking in the Airport Reviews, Consultation paper, CAA, London.


Parker, D. (1999), The performance of BAA before and after privatisation: A DEA study, Journal of Transport...
Regulation of Airports: 
What can India learn from Germany? 
by Hans-Martin Niemeier

Introduction

Each year since 2003 a group of students from Symbiosis Institute of Management, Pune, India have come to our University to attend a summer school about the Economics and Politics of the European Union.

Similarly, in 2009 and 2010 I was asked by the OECD / ITF Transport Research Centre to analyse EU airport regulation and just recently the World Bank approached my colleague Peter Forsyth and me to evaluate the regulatory philosophy of Indian airports.

In a mixed class of German and Indian students we have debated airport regulation. I have enjoyed and benefited very much from these discussions. What strikes me most was that both groups of students shared initially one belief, namely that India can learn a lot from Germany and Germany can learn next to nothing from India. This prejudice is very much shared by the general public. Also the prevailing view in the industry is that Germany manages airports better than India. After all, airports of Germany and other industrialized airports have invested in Indian airports.

In this paper I like to critique this common belief. When it comes to airport regulation Germany (and many European countries) could learn a lot from India. In the first section I will sketch out some differences and similarities between German and Indian airports. Thereafter, the regulation of both counties will be assessed. Finally the findings are summarized.
German and Indian airports – a quick overview

This chapter does not analyse passenger numbers, growth and other important aspects. In this regard the airports of the two countries differ substantially. For example, Frankfurt Airport serves about as many passengers as the two largest India airports of Delhi and Mumbai together. More important are the similarities and differences in regard to competition and regulation and to public versus private ownership. The latter will be discussed in turn.

Ownership. Germany and India differ to some extent in their response to the wave of privatisation of airports which started 25 years ago. Although the first privatisation of a (major) airport occurred in 1987, when the British government privatised the three London airports together with the BAA’s Scottish airports, the trend to privatisate airports took off a few years later in the mid 90s. BAA’s performance and its rising share prices were widely seen as a success, making it a kind of role model for the privatisation of airports. Most importantly, the relatively stable and high profitability of airports made them an attractive object for investors to buy and for governments to sell. Germany has been reluctant to immediately follow the trend of privatisation. In the mid-nineties a plan was proposed to build a new fully privatised Berlin airport. The entire project had a number of setbacks and had been delayed by many political scandals. Finally, privatisation was given up. Up to now no private investor has acquired a majority stake in a German airport and of the main airports only Düsseldorf, Frankfurt, Hamburg and Hannover are partially privatised. Also India has been quite hesitant to fully privatisate its airports, but have at least given a majority share to the private sector. In 1999 the airport of Cochin was privatised, in 2004 Bangalore and Hyderabad and finally in 2006 Delhi and Mumbai. 74 % are hold by private investors among them Zürich airport and Fraport. The state owned Airport Authority of India still holds a share of 26 per cent in these airports and manages about 90 airports (Graham, 2008).

Competition and Regulation. From an economic viewpoint, ex-ante regulation is justified if an industry has persistent market power and regulation increases economic welfare. The absence of any close substitute due to barriers of entry creates persistent market power. This might be due to legal and planning restrictions leading to a lack of attractive locations or to a production technology of a natural monopoly characterized by a combination of economies of scale and scope and sunk cost. The latter is due to the fact that assets are highly specific and cannot be easily redeployed.

Regarding the strength of competition, Germany and India differ substantially. In India there is little scope for direct competition between airports as catchment areas do not overlap. Competition from new entrants will also be rather ineffective. This is largely due to the policy of the Government of India not to allow any new airport to be built within 150 kms distance of an existing airport.
This policy gives only room for hub competition and competition for base of aircraft. Both types of competition are most likely insufficient to reduce the market power (Forsyth and Niemeier, 2011).

Germany has roughly 20 international airports and about 30 regional airports. It has a relative high density of airports compared to India and also to most EU countries. In some local markets like North Rhine Westphalia, airports are so close to each other that airports are good substitutes. In other regional markets, for example Hamburg or Berlin, established airports have a local monopoly. According to Malina (2010) nearly half of the 35 German airports face substantial competition (among them Düsseldorf), while the other half has substantial market power among them (Berlin, Frankfurt, Hamburg, Munich and Stuttgart).

In short, in both countries airports become more commercialised and due to partial privatisation (in the case of India with a majority share) more profit orientated. In both countries at least some airports, especially the major ones, have persistent market power so that the question arises how to regulate these airports.

Regulatory institutions

In the following the discussion is confined to two key aspects of regulation, namely how well the regulatory institutions are designed and what kind of incentives are set.

Regulatory institutions. Regulatory institutions should fulfil the following criteria (Niemeier, 2010):

- legislative mandate from elected legislature;
- independence and accountability to democratic bodies. The function of regulator and ownership should be separated. Parliament should control the regulator if he fulfils its statutory obligations. It should not intervene directly in day-to-day business;
- the regulation should be a fair, accessible and open process;
- the legislative mandate is efficiently implemented without high bureaucratic costs.

In respect to these criteria German airport regulation does not perform well. The federal states actually regulate charges, but the Department of Transport (DoT) can intervene. Regulation by the states creates peculiar problems because the states also own airports. It has lead Stefan Schulte (Fraport) to adopt a very peculiar way of defining independence: “As for Frankfurt Airport, the Hesse Ministry of Economics, Transport, Urban and Regional Development (HM-WVL) – which is the responsible government entity for aviation – is clearly separated and acts independently from the Hesse Ministry of Finance, which represents the state’s 30 per cent shareholder interest in Fraport., 2009, p. 8) What Schulte calls independency is usually called dependency or in economic terms “regulatory capture” (Stigler, 1971).
The users of an airport are consulted, but the users have a weak position, because the reasons for approval or disapproval of a decision are neither made public to the airlines nor to the general public.

Contrary to Germany, India has not only privatised airports but has also established an independent regulator. Airports Economic Regulatory Authority of India (AERA) is an authority separated from ministries owning or managing fully or partly public airports. AERA regulates 14 airports out of 89 operational civil airports with a passenger throughput of more than 1.5 million. The chairperson and members of AERA can be only be removed from office in cases of a proven abuse of their position or physically or mentally incapability. AERA is accountable to the Parliament. Among other things, accounts of the Authority certified by the Comptroller and Auditor General of India together with the Audit Report have to be annually laid before each House of Parliament on an annual basis. Furthermore, airports, airlines and other users have the right to appeal against regulatory decisions by being able to take the regulator to court. India has established a specially constituted Appellate Tribunal which is headed by a former Judge of the Supreme Court of India.

In summary, the regulatory institutions in India are well designed and superior to Germany and the majority of European countries which with the notable exceptions of Austria, Ireland, the Netherlands, and the United Kingdom have dependent regulators.

Regulatory incentives. The central problem for regulation is that the regulator has asymmetric information about the demand and cost functions and that the regulator must design a contract to set incentives for the regulated firm. While high powered regulation sets incentives for cost reductions and productive efficiency and an efficient price structure, low powered regulation does not. There are currently two regulatory forms practised.

The first one in cost based regulation. The vast majority of authorities in Europe regulate airport charges according to principles of cost relatedness. The charges should create just enough revenues to cover total costs including the depreciation of capital and a normal rate of return on capital. There are two problems with cost based regulation: Firstly, incentives are set for cost-padding leading to productive inefficiency. Secondly, cost based leads to an inefficient price structure. Under cost based regulation the airport has no incentive to adopt peak pricing, but instead may overprice off-peak demand and under-price peak demand.

The alternative to cost based regulation is price cap regulation. A price caps sets charges over a certain period in accordance with the rate of inflation (PRI) minus productivity gains (X). Unlike cost based regulation, price caps do not regulate profits, but set incentives to cost reduction. The gains from cost reduction can be kept by the regulated airport within the regulation period and might be then passed to the users via lower charges.
Pure and hybrid price caps differ in the way that the X is set in the price cap formula. The X should reflect the productivity growth of the regulated industry in excess of the rest of the competitive industry. Pure price caps set the X without reference to the costs of the regulated firm by benchmarking while hybrid set the X with reference to the regulated cost base. Hybrid price caps provide less incentives for cost reductions as for e.g. the regulated could be a high cost firm at the regulated period in order to raise prices and profits.

Legally, the German regulatory system does not define exactly how airport charges must be regulated. But cost based regulation has been a common practice for the last two decades and only Hamburg airport is currently price capped. The prevalence of traditional cost based regulation has strong negative effects on efficiency. Regulation in Germany sets systematically incentives for inefficient provision and management of airports resulting in too high costs for airlines and an inefficient use of existing capacity (Niemeier, 2009).

Indian regulation has reformed its airport regulation towards incentive regulation by adopting a hybrid price cap model. However, reforms are usually piecemeal and this is also the case with the current regulatory approach in India. One of the of problems to be addressed in the near future is how to avoid that the hybrid cost based system will be applied to mechanically so that it becomes a forward looking cost based regulation (see on this Forsyth and Niemeier, 2011).

If India will go in this direction regulation will become similar ineffective as in Germany although even such a system is still superior because it will be more transparent and cost padding will not as easily achieved.

Summary

The answer to the question what can India learn from German airport regulation is simple. It can learn a lot, namely how to avoid regulatory capture and failure. The German regulatory regime sets incentives for inefficiency and rent seeking. It does not guarantee a fair process of regulation and it will create tensions between airlines and airports which easily can lead to high transaction costs. India can avoid this and obviously is heading in the right direction in particular if it continues to price cap and avoids cost based regulation.

Acknowledgements

I am grateful to Peter Forsyth and Mark Winzler for comments on earlier version. The responsibility for any remaining shortcomings remains the author’s.
References

Forsyth, P. / Niemeier, H.-M. (2011), Assessment of the regulatory philosophy of Airports Economic Regulatory Authority of India (AERA), mimeo, Bremen
Graham, A. (2008), Managing airports an international perspective, 3rd edition, Amsterdam Elsevier
European Airline Mergers – Implications for Competition Policy
by Adél Németh

Introduction

The ‘more economic approach’ in EU competition law appeared at the end of the 1990’s with the aim of bringing competition law enforcement more in line with current economic thinking. and the literature on air transport economics began to flourish. Actually, US deregulation has been spurred by a shift in economic thinking on regulation and the characteristics of air transport; the famous contestable market theory served as a cornerstone for opening up air transport markets.

Considering these two developments, it seems to be worthwhile to examine whether the general trend of more economic approach also influenced the application of EU competition rules in the field of air transport. The main question of research is whether these decisions used the results of air transport economics and whether any trends can be identified.

In the following we will shortly describe the more economic approach of EU competition law, and then give a snapshot of airline consolidation in Europe, followed by the summary and categorization of air transport economics, and afterwards we will examine the experience of alliance and merger decisions.

Nobody can doubt the advance of more economics in competition law enforcement.

In the field of air transport, US deregulation at the end of the 1970’s and the subsequent liberalization of EU markets beginning from 1987 also raised the attention of economists
The more economic approach in EU competition law, a general overview

Over the last 10-15 years, the ‘more economic approach’ has been a trend in all policy areas of EU competition law with widely differing effects. The more economic approach implies the increased use of modern economic theories and analyzing techniques. Econometric data analysis is applied whenever possible provided that the data sets needed are available. The more economic approach also means a departure from the legalistic form based (called also ‘per se’) assessment to an effect based economic (‘rule of reason’) approach and represents a declared shift towards the protection of consumer welfare and consumer interests. The first document, which might be mentioned as a result of the more economic approach, was the 1997 Commission notice on the definition of the relevant market (EU COM, 1997).

Concerning restrictive agreements, the reform of vertical agreements was the first step towards a more economic approach. Commission regulation 2790/99 in 1999 radically changed the treatment of vertical restraint. The new block exemption regulation contains only a black list, i.e. it prescribes only those provisions that are prohibited. The regulation introduced a more effect-based approach when it emphasized the importance of market power in determining those agreements that cannot be exempted by the regulation. It was complemented with a guideline on vertical restraints. The guidelines also provide a framework of economic analysis that should be used during the assessment of vertical restraints. Following the reform on vertical restraints, the Commission continued with horizontal agreements, including R&D, specialization, joint purchasing, joint selling, standardization or environmental agreements. Game theoretical insights on the functioning of anti-competitive cartels helped the elaboration of European leniency policy and, in recent years, settlement procedures.

In 2003, the Commission created the position of the Chief Economist who would provide expert opinion with the help of its staff on the economics used in Commission procedures. Simultaneously with the enlargement of the EU, a new merger regulation has been adopted (EU COM, 2004), which replaced the substantive test of the earlier used dominance test with the SIEC test (significant impediment of effective competition). With the help of the new test, the non-collusive oligopoly problem can be addressed as well. The Commission also adopted guidelines in the area of merger policy. The horizontal and the subsequent non-horizontal guidelines deal in detail with the appraisal of mergers and the assessment of non-coordinated (unilateral) and coordinated effects and the possibilities of an efficiency defense.

The last stage and probably the most difficult task of introducing a more economic approach to EU competition law, is the issue of Article 102 TFEU, the legislation on the abuse of dominant position.
It was no coincidence that the reform of Article 102 began only in December 2005. Many critiques have been expressed due to the not radical enough deviation from the old approach. The Commission is open to changes and ready to move in the direction of a more economic approach.

**Airline consolidation**

The liberalization of European air transport has been completed in three steps from 1987 to 1992. The enlarged market place provided better opportunities for European airlines. Several new start-up airlines entered the market; old airlines began to enlarge their activities by entering earlier restricted markets. On the other hand, leading European airlines began to strengthen their position on the market with the takeover of competing airlines. The probable loss of traffic rights is one of the reasons why many airlines made and still make use of strategic alliances, which help them to mimic the effects of a merger without actually completing one. This process led to almost 40 decisions from the side of the European Commission, which concerned both merger decisions under the European merger regulation and alliance cases under Article 101 TFEU. The amount of decisions also enables us to examine the influence of economic theory on the practice of the Commission, which we will show in section 5 after summarizing the literature. In the following section we show the importance of understanding economics in the competition policy.

**Economic literature on aviation**

Economics uses market structure as a starting point by analysing a given industry. The main output, namely the profit of an industry, is up to the market structure. In the case of oligopoly, the individual profit is higher than zero. The best case from the airlines point of view is a monopoly with high profit gains, however at the same time this is the worst case from the passengers’ – and even from the Commission’s approach. Airlines try to achieve the highest possible profit, while the aim of the passengers is to obtain the cheapest ticket. The role of the authority is to balance these very different purposes, increase the social welfare and maintain the competition in the airline market.

How do passengers decide, which airline to choose? In order to answer this question, we have to understand what the passengers would like, what their preferences are. The main determinants of a traveler’s utility are: the money cost of the flight, the preferred departure time and the opportunity cost of time.

After we described the utility function, we can write out the passenger demand for a given airline route. Morrison and Winston (1989) used the multinominal logit model in order to determine the passengers’ best choice between different airlines. The passenger chooses the airline, which offers the highest utility, the highest satisfaction. The decision is made by fare, service time, safety record, reputation and promotional offerings.
The key factor in offering a route is the cost of the flight. Not only the total cost of the flight, but the marginal cost of an additional seat, an additional passenger is very important. If there is perfect competition, the marginal cost should be equal the price of the airline ticket. The fewer competitors we have, the more concentrated is the industry. High concentration is described with higher market shares, which can harm passengers if the airlines have significant market power. On the other side, concentration can be positive, since the merged airlines have higher economies of scale and traffic density. A big airline with cost efficiencies can keep the marginal costs lower, offer cheaper tickets and benefit the passengers.

The main part of the literature is concerning with price changes after merger. Werden, Joskow and Johnson (1991) compared the first US merger cases (NW-RC and TW-OZ) and found evidence of the increased fares from 1985 to 1987, fares increased by 5.6 per cent on the overlap market. Kim and Singal (1993) compared 14 US airline merger cases in the period of 1985-1988. The authors found that in this time the merged airlines increased fares by 9.44 per cent compared to other routes unaffected by the merger. Evans and Kessides (1994) analyzed collusive multimarket contracts among 33 US airlines during 1984-1988. The authors concluded that if the structure moves from the monopoly situation to a duopoly, prices fall by 11 per cent, but from the four-airline to the five-airline oligopoly the change in prices is only 1.1 per cent. Carlsson (2002) was the first to compare airline data from eight European countries. He found, that the market structure has no significant influence on the ticket price for leisure passengers. Peters (2003) compared six US merger cases from the 1980’s and showed how the post merger prices were developed. He suggested – as first in the literature – using cross-price elasticity and concluded that actual price increases were definitely higher, than the predicted prices with all of the available economic models. Kwoka and Shumilkina (2008) analyzed the USAir (now US Airways) – Piedmont Airlines case from 1987. The authors showed that air fares increased by 10-12 per cent on overlapping routes. They also proved that there is another new anti-competitive effect of mergers, the incumbent pricing. This allows the merged airlines to deter entry and raise the prices by 5-6 per cent on affected routes by eliminate of potential competition.

While airlines always benefit from the merger (increased producer surplus), consumers might be worse off. The purpose of the European competition policy is to maintain competition and not to harm consumers. Morrison and Winston (1989) analyzed six US merger cases from the welfare point of view. The authors appointed that if there had not been an extended Frequent Flyer Program, all of the mergers would harm the passengers, by around annual $335 million. If the competition policy focuses only on price effects, they will always find proves again the merger. Brueckner and Pels (2005) examined the European airline mergers and
alliances and their effects on consumer welfare. The conclusion shows that the effects of the analyzed merger (KLM/Air France) were anticompetitive. The overall decrease in consumer surplus was even higher than the increase in producer surplus due to efficiency gains.

Werden, Joskow and Johnson (1991) measured the market share on a new way: taken into account not only incumbents (previous HHI measure), but also new entrants. With their results they criticize the DOJ decisions, not predicting the significant anticompetitive effects regarding the NW-Rc case. However, the authors concluded, “no economic model could ever hope to accurately predict effects on individual city pairs”. Carlsson (2002) defined the market share as the airline’s share of the aggregate number of seats. The paper concluded that due to the significantly different coefficient values, the Herfindahl index is restrictive. Peters (2003) concluded that due to the anticompetitive post-merger entry deterrence behavior, new entry had very small effects on price reduction. He suggested the policy should not be expected to yield large gains from expected new entries.

While airline mergers mostly harm consumers, Carlton, Landes and Posner (1980) found evidence on the welfare-increasing role of code-share agreements. By analysing the North Central Airlines and Southern Airways merger from 1977 they declared the fares to be 9 per cent lower, while the achieved timesaving was even 12 per cent. The authors found that this merger had a “total annual consumer benefit ... of USD 3.54 to USD 4.79 million.” However, one should point out that this case happened before the deregulation.

EU Commission decisions in the light of the literature

In July 2002, the European Commission authorized, till the end of 2005, the cooperation agreement between AuA and LH concluded within the framework of the Star Alliance. The decision mentions almost exclusively alliance benefits of a qualitative nature. ‘Improved possibility of transfer and connections’, ‘attractive connections’, ‘a more comprehensive European network’, ‘better planning’, ‘extension of network’ are rather abstract and not easily quantifiable effects. Furthermore, the Commission did not try to balance the potential negative effects against these undefined positive effects. Furthermore the Commission did not assess whether the imposed remedies would really restore competition on the Austrian / German markets. It simply accepted that the almost complete elimination of competition on Austrian / German markets served the achievement of better connections, improved transfer or extension of network. It also tried to reduce barriers to entry on these markets to incentives new competition that would produce a downward pressure on prices without actually making sure that based on the economic reality of the particular O&D markets an equally competitive alternative would appear up front.
The Lufthansa-Austrian merger case (EU COM, 2009) was the fifth merger in Lufthansa’s last 5 years history. Austrian Airlines had financial problems and KLM / Air France already announced to take over the loss making Austrian flag carrier. Neither Deutsche Bahn nor alliance partners were considered as competitors. Only Niki, TUIfly, Sky Europe and partially Air Berlin could reduce the common market power of LH and Austrian on these routes. Since the decision in August 2009 Sky Europe went into bankrupt, and Air Berlin took over TUIfly.

The question is, whether the efficiency gains can outweigh the anticompetitive market power? Since there is no data available about route price changes due to the merger, we have to rely on Lufthansa’s calculation on technological synergies: annual revenue gains: EUR 3.2 mill.; the annual distribution cost efficiency: EUR 30.4 mill. and the annual other cost efficiency: EUR 18.4 mill. Now, where do the revenue gains come from? After the merger the LH Group immediately cut all its flights from Vienna to Stuttgart by more than 20 per cent. Since LH has a monopoly on this route and already decreased the frequency, the question arises whether the revenue gains come from the monopoly pricing.

In contrast to this, on the route Vienna-Cologne/Bonn a new airline (Air Berlin) appeared with 8 weekly frequencies. This entrance decreased the previously 100 per cent market share of LH down to 82 per cent. However, there is a surprising point in the Commission’s decision. They considered the market share of all passengers at Austrian to be 5-10% in 2008, while Austrian provided 18 weekly flights. The only “competitor”, Germanwings offered another 20 flights with the market share of 80-90% (EU COM, 2009, p.29.) In our point of view, there must be some mistake in the calculation.

On the Vienna-Frankfurt route NIKI increased its frequency by 7 per cent, which led to a decrease of market share by LH. However, on the Vienna-Brussels route the only competitor, Sky Europe exited the market and left monopoly power for LH behind. Hereby LH increased her flights under SN, but unfortunately we do not know the precise data according to Austrian flights in 2008.

Conclusion

In summary, the AuA / LH alliance decision seems to be not influenced too much by the “more economic approach” since its evaluation of the circumstances of the case are based on rather dubious assumptions both in terms of the potential harm, the potential benefits and the applicable remedies as well. The decision referred to none of the literature already at hand at that time, which would support the general findings on negative or positive effects of the cooperation, nor did the Commission perform its own calculations based on data required from the parties to base it case. Today, in a case like this the Commission would apply a much higher standard of proof for sure.
In the light of the results of the LH / Austrian merger case, the Commission needs to consider again, whether it used the economics in its decision right and whether his forecast due to new entries was really established by the theory. We recommend to do further research according to the anticompetitive effects of the previous European airline mergers.

References


The Potential Contribution of Aviation to Economic Growth and Poverty Reduction in Sub-Saharan Africa
by Eric Tchouamou Njoya

Introduction

The potential for air transportation to be a driving force for the development process of a local economy by way of providing employment, contributing to international commerce, stimulating tourism and acting as a catalyst for investment in the development and the location of companies is well documented (Button and Taylor 2005, Kasarda et al. 2004, Cooper and Smith 2005, Brueckner 2003, ATAG 2000). It has also been gradually acknowledged that air transportation has a particular role to play in the long-term economic growth of developing countries (UNCTAD 1999). Without an efficient air transport system, it is difficult for a number of low-density and land-locked African nations to develop and sustain international trade and tourism.

Despite this, aviation as an engine for Pro-Poor Growth in Sub-Sahara Africa (SSA) has been given limited attention so far. Previous studies focusing on the link between aviation and poverty reduction include, among others, a study by Oxford Economic Forecasting for Air Transport Action Group (ATAG) (2003) and a study by Leautier (2001) for the World Bank. Both studies conclude that there is a positive correlation between air transportation infrastructure development and poverty reduction. The limited attention devoted to the role of aviation in SSA has resulted in a lack of empirical analysis to inform policy makers. This work deals briefly with the role of the air transport industry in fostering economic growth and poverty reduction in SSA. It refers to its current structure and suggests how the region can benefit from an expansion of air transport.

Air transport development in Sub-Saharan Africa

Air transport is vital for the promotion of
international trade, regional economic integration and tourism as well as for socio-economic development in general. It is a critical means of transportation of people and goods for many land-locked African nations (e.g. Mali, Niger, Central African Republic, Chad, Burundi and Rwanda) given especially the underdeveloped surface transport networks. In the early 1960s, several African nations acceded to independence. Since then many have gradually developed and improved their air transport industry. However, air transport expansion in the region is unevenly distributed. While Eastern and Southern Africa have successfully established a strong air transport industry, Central and Western Africa have been less successful (ECA 2009).

Eastern and Southern Africa have developed major hubs, namely Johannesburg, Nairobi and Addis Ababa and are home to the three most successful airlines in SSA: South African Airways, Kenyan Airways and Ethiopian Airways. Central and Western Africa on the other hand are characterized by less developed hub system, smaller and in some cases negative growth, which partly is attributed to the collapse of majors carriers on the Western side, most notably Air Afrique in 2002 and Nigerian Airways in 2004.

Over the past decade, air traffic in Africa grew by 5.7 per cent on average per annum. An analysis of the patterns of air transport flows shows that Africa has a weak foothold in terms of international air transport. In 2007 SSA accounted for only 1.46 per cent (compared to 1.58 per cent in 1993) of worldwide registered carried departures (UN 2010). In 2008 African Airlines carried a total of 53 million passengers, representing 25 per cent of passenger air traffic. A look at the passenger traffic distribution i.e. Africa to other regions, gives the following: Africa-Europe 64 per cent, Africa-Middle East 16 per cent, Intra-Africa 15 per cent, Africa-Asia Pacific 4 per cent and Africa-North-America 1 per cent (EU-Africa Aviation Conference 2009).

Domestic demand in most countries is weak except for South Africa. In 2008 domestic passenger carried in Africa represented 39 per cent. The share of African airlines in the inter-continental market has decreased over the decades. While in the 1970s and 1980s SSA had about 21 inter-continental airlines (including Air Afrique which covered 11 States), today it has been reduced to just 4, namely Ethiopia, Kenya, Senegal and South Africa (EU-Africa Aviation Conference 2009).

Air transport flows are highly concentrated in a small number of countries. In 2008 the top five SSA countries South Africa, Ethiopia, Kenya, Nigeria and Senegal represented roughly 70 per cent of total air traffic in the region. The particularly strong position of Kenya, Senegal and South Africa is coupled with strong growth in international tourism in the respective countries. Seven low cost carriers operate in Africa and a number of low fare operators also exist. Two SSA airlines are members of global alliance groups: South African Airways (Star Alliance) and Kenya Airways (SkyTeam).

Air cargo traffic carried to and from SSA totalled 1.4 million tonnes in 2003 which represents a 3.55 per cent increase from the
In the previous year (ATAG 2003). Intra-African air cargo traffic represents only approximately 7 per cent of the overall African cargo market. This illustrates an underdeveloped trade pattern and deficiencies in infrastructures. African airlines carried 800,000 tonnes freight in 2008 (EU-Africa Aviation Conference 2009). Just as with the flow of international passenger traffic, most of the cargo traffic is concentrated in a few countries, with the top five countries accounting for more than 70 per cent of Africa’s total. Out of the inter-continental cargo traffic in Africa, 65 per cent is related to trade with Europe and 14 per cent to trade with the Middle East. The dominance of Europe could be explained by its proximity to Africa and by long-standing historical and investment ties. Cargo traffic is mainly long-haul with Europe being the major cargo route (ATAG 2003).

According to Bofinger (2008), airport infrastructures, such as runway capacity, do not seem to be a constraint in traffic. Limiting factors for traffic rather include the ability to enter or leave the runway via taxis, the amount of apron space for parking and the amount of terminal space for processing passengers. In November 2007, a total of 2,900 airports were estimated in Africa, of which 280 received regularly schedule services. There are four major gateways in SSA, namely South Africa, Kenya, Ethiopia and Senegal (Bofinger 2008).

Air navigation services and air traffic control throughout SSA are underdeveloped and are concentrated in a few centres. South Africa and Kenya have several radar installations and are able to actively monitor traffic. Ethiopia, with the third most important airport in SSA, has no air traffic surveillance technology (Bofinger 2008).

Air transport development in the region is linked with the matter of harmonization of air transport policies. It is generally assumed that restrictive regulations in the aviation industry has harmful effect on competition, availability of seats, number of routes flown and the scope for airlines to reduce costs (Forsyth 1997). While progress in air transport technology and other favourable conditions, such as the liberalization of air services contributed to creating an efficient air transport in other regions, the African air transport industry is associated with high costs, unreliability, restrictive regulatory policies, poor safety and lack of infrastructure.

In most countries, bilateral agreements continue to impose controls and regulations with great emphasis on frequencies, capacity, route schedules, prices, and a limit on the number of designated carriers (ECA 2002). The rapid worldwide expansion in air transportation was accompanied by a trend towards liberalization which began in the US in 1978 and deregulation of intra-European travel markets, the final phase of which was completed in 1997. Thanks to these developments and to the interdependence of the aviation system, it was necessary for African nations to revisit their air transport policy. The main regional initiatives relating to the liberalization of intra-African air transport were developed and adopted in the
Yamoussoukro Declaration of 1988 and the Yamoussoukro Decision of 1999 (ECA 2002). The gradual liberalization of the internal African market has resulted in better intra-African connectivity and the airlines which are benefiting from this include Ethiopian, Kenya Airways and South African Airways.

Poverty reduction effects of Aviation

One of the most pressing problems in the world at large and particularly in SSA today is Poverty reduction. Sub-Saharan Africa is the developing region with the highest number of people living in extreme poverty. Most of the studies addressing the issue focus on the contribution of the agriculture and manufacturing sectors. Service sector contribution in general and air transport contribution to poverty reduction in particular have been somehow neglected. Traditionally the contribution of the air transport industry has been measured by looking at the direct, indirect and induced spending using a multiplier effect analysis. Direct economic benefits include salaries of airline personnel, fuel purchased, landing fees, salaries of airport personnel, and other similar purchases and expenditures.

Indirect benefits account for the financial benefits that are attributed to airport and airline activities ranging from services provided by travel agencies, rental car companies, hotels, restaurants to other retail activities. Finally, induced economic benefits are the multiplier effects of the direct and indirect benefits. Induced economic benefits consist of the increased employment and wages that come from secondary spending that result from the direct and indirect benefits.

One of the benefits of air transport is its positive effect on international trade, being particularly important for countries that adopt an outward-oriented development strategy. Kenya as a major exporter of fresh produce (vegetables to Europe and the Gulf, cut flowers to Europe) needs a comprehensive air traffic system to support its agriculture. Air transport facilitates companies’ global reach and provides better access to markets, enhances communications and interactions between businesses and therefore increases the opportunities of operating in a global economy. Air transport plays an increasingly important role in lower income countries as it enables the movement of perishable goods. Export freight in SSA largely consists of perishable goods (fruits, vegetables, cut flowers and fish) and apparel, textiles and fabrics. Import freight consists of spare parts and highly manufactured items (e.g. computers and peripherals, telecommunication and transport of hardware and pharmaceutical goods).

Arguably, the major potential contribution of the expansion in air transport to economic development in SSA is through developing and promoting international tourism (ATAG 2003). Air transport in SSA is an essential part of the infrastructure required for domestic and international tourism development. This is so for domestic tourism because land transport is often insufficient or unfeasible and for international tourism
because it is often the only or dominant mode of transport.

Tourism and air transport have a clear dependency: making tourism development sustainable is a good way of adjusting supply and demand for air transport for tourism purposes. Therefore, while air transport infrastructure in itself cannot reduce poverty, it has a key role to play as a facilitator of and complement to policies that aim to improve living standards. Gómez and Sinclair (1991) argue that air transport plays a key role in the distribution of tourism earnings and benefits since the use of national airlines and local services and commodities by tourists contribute significantly in increasing the developing country’s share of tourism receipts.

Air transport opens new destinations and new forms of tourism such as long-haul excursions. Tourism development is being portrayed as one of the few profitable economic sectors for developing countries (UNWTO 2002). The positive impact of tourism as a major export and a powerful tool for enhancing growth, redistributing income and alleviating poverty is a truism that has recently received theoretical and empirical support in a number of well-known studies (Dubarry 2004, Kweka et al. 2001, Sugiyarto et al. 2003). Tourism has also been recognized as an industry capable of playing an important role in the achievement of Millennium Development Goals.

The World Tourism and Travel Council (WTTC) highlights that the global travel and tourism industry can help raise living standard by stimulating the growth of infrastructure, providing good opportunities for women and young people, the unskilled and people in rural and remote areas, who might otherwise have few opportunities (WTTC 2002). As one of the fastest-growing industries, tourism generates approximately 10 per cent of the global economic output and roughly 10 per cent of total global employment (UNWTO). For Sub-Saharan Africa countries, the travel and tourism sector is expected to contribute about 6.9 per cent of total gross domestic product (USD 75.7 bn) and 5.0 per cent of total employment in 2010 (WTTC 2010). In SSA, around 51 per cent of international tourism is by air.

Furthermore, air transport has an important impact on other industries as it acts as a catalyst in investment, innovation, competitiveness and productivity. The existence of aviation services in a region can be of paramount importance to companies when investment decisions are being taken. A lack of good connections may lead to investment being made elsewhere.

Generally speaking, air transport is a powerful factor in economic growth and can also support efforts to reduce poverty. Nonetheless, in the case of Africa, air transport is fettered by a number of constraints which can in some cases hinder the development of trade and international tourism.
Prospects for the future of aviation in Sub-Saharan Africa

A number of problems that are likely to have a negative impact on the development of aviation have arisen. These include problems relating to aviation policies, the inadequacy of aviation infrastructures, aviation safety, and, last but not least, the lack of macroeconomic and political sustainability.

Factors that favourably impact the development of air transport include sustainable macroeconomic conditions which result in rapid growth in trade and investment opportunities and higher disposable incomes on the demand side, and access to new technology on the supply side.

The contribution of aviation expansion to economic development and poverty reduction in SSA largely hinges on conditions inherent in the air transport sector that are likely to benefit both airlines and passengers and also on the conditions inherent in the international tourism sector with regard to African tourism destinations. Free market policies are all-important in this respect insofar as they contribute to increasing competition and by extension, to increasing capacity (airlines benefit from economies of scale, scope and densities) and lowering prices (beside low prices the passengers also benefit from higher frequency of service and better range of available destinations).

The participation of African airlines in alliances and in hubs would serve to develop their market access and to increase the number of connections to international tourist-generating markets, which would probably support the region’s potential for tourism development and poverty reduction. The expansion of budget airlines is another way of developing regional connections in Sub-Saharan Africa by taking advantage of the possibilities offered by the liberalization of intra-African air transport resulting from the Yamoussoukro Decision.

Privatization and the promotion of public-private-partnerships could help to overcome the problem of aviation finance. Sub-Saharan African airports and airlines are predominantly owned by governments. This consequently results in an inept management caused by bureaucratic controls. Some countries have in recent years embarked on airport privatization, or are at least pursuing corporatization and commercialisation of their assets in the sector, notably Côte d’Ivoire, Senegal, and South Africa. Kenya Airways has also been successfully partially privatized since 1995. Investment in air traffic facilities is necessary to cope with the problem of transport safety and security in SSA.

Conclusion

The impact that air transport can exert on the shape and welfare of SSA nations is often ignored. Civil Aviation is an important engine of growth and will play a major role in any meaningful effort aimed at accelerating the pace of development of SSA.
countries. By expanding markets, increasing foreign direct investment, enabling the free movement of people, boosting tourism within and into Africa, facilitating the transfer of technology and boosting domestic productivity, aviation creates employment and increases domestic income.

The expansion of air services and other forms of transport infrastructures can contribute to poverty reduction by improving access to services and markets, decreasing transport costs (which could reflect in the prices of final goods), increasing mobility of people and goods by improving employment opportunities. The construction and maintenance of transport facilities tend to demand relatively unskilled labour, providing a source of employment for the poor (ATA 2003). Inefficiencies at the level of airports and air traffic infrastructures coupled with limited competition in the airline market are making market access both difficult and expensive. Although improving land transport is a priority for SSA, the potential of air transport’s contribution to the region’s economic growth and poverty reduction should not be underestimated.

Analyses of the contribution of the aviation sector to economic development have hitherto been partial in nature. Perhaps there is a need to move beyond economic multiplier type analyses and instead concentrate at first on local economic growth and then establish who benefits and potentially loses. If aviation policy is ultimately about investing in public infrastructure to improve the living standard of the local population, then the effect of aviation policy on economic welfare should be a key consideration.

To assume, for example, that economic welfare improves simply because more money is spent by tourists is a big assumption. Whether the benefits of aviation or tourism growth will trickle-down to the poor and pull them out of poverty, and the channels through which this will happen have not been given enough attention so far in the literature. After all many of the jobs in tourism are low skilled, poorly paid and seasonal. Thus, government development strategy relating to aviation and tourism should be concerned about these issues.

These issues will be addressed by future research with the aim of generating insights that can have practical policy relevance. An integrated model in which direct and indirect feedback mechanisms are taken into consideration, such as the Applied General Equilibrium Model, appears to be an appropriate tool for examining the income distribution impact of aviation growth as it can capture most synergies and conflicts in various industries within the country.
References

Recovery of the Baltic States after the Crisis: Necessities and Strategies

by Alexander Pfannkuche

Back to a path of growth?

For the past two years the Baltic States Estonia, Latvia, and Lithuania have been caught in a fatal recession. The Global Financial Crisis has hit these economies particularly hard: The overall output declined at a double-digit figures rate and unemployment soared. A full recovery in economic and social terms seems to be a long time off. Although contractions in GDP coming to an end in 2010 (Estonia and Lithuania, not for Latvia) the future growth prospects for the Baltic States are moderate. On the other hand, the high unemployment rates in Baltic States are likely to become a persistent problem within the coming years.

Following the latest forecasts of the IMF’s World Economic Outlook (October 2010), GDP recovery to pre-crisis levels can be achieved around 2014/15 at the earliest, considering average output declines of 20 per cent in the recession years and future growth of 3 to 4 per cent. The growth of consumer prices is projected to become positive in a very moderate way, even oscillating around the European Central Bank’s inflation target of two per cent.

Before the crisis, Baltic economies were net importers with negative current account balances up to double-digit values. In 2009, the decline in imports was much stronger than the decline in exports, resulting in a positive current account balance. This crisis-induced situation should be phasing out in the next years, as imports to Baltic economies start to strongly increase again.

A profound challenge for policy makers in Baltic States will be the reduction of unemployment. Rising unemployment stopped growing at the end of 2010. For the recovery of labor markets, which should be seen as a dependent market, several obstacles can be identified in view of the economic policy constraints the Baltic States face. These constraints are equal parts external (with no or very limited access to national policy) and internal in nature (chosen economic policies).

Policy constraints: Chosen and non-chosen

Small states, such as the Baltic States, share some inherent economic characteristics: Although they are supposed to suffer from
disadvantages resulting from the small size of their internal markets and bereft of the opportunity to develop into a diversified economy, they are able to exploit quick decision-making processes, benefit from flexibility and transparency – and are able to concentrate on global niche markets, especially in the service sector, where economies of scale are not that important. Furthermore, they have a pronounced ability to attract mobile factors of production (capital, qualified labor) and are able to offer favorable conditions without having to fear countervailing measures by the heavyweights of the world economy (Dehejia / Genschel 1999, Katzenstein 2003, Qureshi / te Velde 2007).

However, their high degree of specialization usually implies a high degree of openness and often also a strong focus of small states on only a few select partners in international business (Armstrong / Read 2002). This can contribute to a high degree of vulnerability to exogenous factors and a high volatility in terms of economic performance: a “mocha cup” effect (it takes only a light shake to make a mess of things).

In the case of the Baltic States the following of these theoretical assumptions are held to be true:

- Small size of markets and a medium level diversification of economy. In all Baltic States Population is below 5 Mio (CIA 2010).
- High stake in service sector. In all Baltic States Service Sector expanded to over 70 Per cent as share of GDP (CIA 2010).
- Flexible institutions, especially Financial markets. Baltic States share low levels of regulation, corporate and business taxes and union density on labor markets (WEF 2010).
- High degree of openness with focusing on trading partners in Scandinavia and Western Europe. The degree of trade openness in 2009 (Exports plus Imports in relation to GDP) was 1.26 in Estonia, 0.91 in Latvia and 1.21 in Lithuania (Eurostat 2010). The main trading partners (> 10% of export or import share) in Estonia are Finland, Sweden, and Germany. In Latvia and Lithuania Russia, Germany, and Poland are dominating partners in trade. Interregional trade between the three Baltic States is of high importance, too (CIA 2010).
- “Mocha cup” effect: High volatility of GDP, unemployment and price level. From 2002 to 2008, the Baltic States achieved GDP growth rates over 10 per cent a year and an impressive reduction in unemployment. Nevertheless, inflation boosted at double digit-figure rates. Within one year (2009) output declined and unemployment soared up to 20 per cent in all countries. Growth of consumer prices stopped or even became negative (EBRD 2010).

These “stylized facts” can be interpreted as a result of the transition path the Baltic States followed after regaining their independence in 1991. With the early implementation of the shock-therapy approach the Baltic States benefited from a speedy economic recovery at the turn of the millennium, but at the price of a high vulnerability to exogenous shocks.
In this context the entering of the pre-accession stage to the Euro-zone in 2004 (and for Estonia the introduction of the Euro in 2011) with the pegging of the local currencies to the Euro made a self-determined monetary policy impossible. The combination of external necessities (orientation towards openness to trade) and past economic framework decisions (transition via shock-therapy, Euro adoption dogma) are leaving less room for policy maneuvers to cope with the recent crisis.

Pros and Cons of the internal devaluation strategy

When hit by a global recession, economies with a strong orientation towards foreign trade have often used the devaluation of their currencies to keep the worst from happening. In 2009, Poland showed how effective this instrument can still be employed. At the peak of decreasing external demand the Polish Zloty depreciated against the Euro, exports remained stable and devaluation helped Poland to regain its export competitiveness.

For more than one reason a devaluation of the Baltic currencies would be reasonable as well. In times of high growth the fairly uncontrolled lending activity of foreign banks, i.e. very large inflows of liquidity, resulted in an overshooting of private consumption and a spiral of demand-driven inflation combined with increasing wages. As a result, the Baltic States have lost ground in international competitiveness:

Compared to 2009, performance of Baltic States in the Global Competitiveness Report (2010) decreased. Estonia lost 3 ranks (from 32 to 35), Latvia lost 14 ranks (from 54 to 68), and Lithuania lost 9 ranks (from 44 to 53).

When the Global Financial Crisis (GFC) began, their economies nearly collapsed due to simultaneously deteriorating stability of the countries’ financial markets and decreasing world demand. In this very situation the Baltic States were facing high unemployment and needed to regain their competitiveness, but the ability to devalue their currency is not possible under the Exchange Rate Mechanism II (ERM-II) regime. Fiscal policy is neither applicable (due to restrictions of the stability and growth pact) nor sensible given the fact that external devaluation is impossible. Fiscal stimuli without devaluation of the currency could harm competitiveness once more when the goal of activating weak private demand overshoots. The policy makers in Estonia, Latvia and Lithuania decided to pursue an alternative approach to get their economies out of the recession: an internal devaluation.

In the medium run the Baltic States are trying to regain their competitiveness via internal devaluation. This can only be achieved via decreasing labor costs and moderate growth of the inflation rate. Both variables cannot be influenced by policy makers directly, but governments can support the change in real wages with...
cuts in public spending, balanced public accounts, and maintaining flexible labor market institutions. Inflation in small countries is mostly influenced by demand-driven booms and import prices and is therefore an outcome of labor market processes (demand-led inflation) and world markets (imported inflation). In the recent situation this strategy might not be helpful to reduce unemployment in a timely manner. Nevertheless it offers one great advantage: The ability to restore confidence among international investors.

The Baltic States greatly benefited from large inflows of Foreign Direct Investment (FDI) during the last decade. Although the abrupt drop-off in FDI at the beginning of the crisis aggravated the output decline, the financial system of the Baltic States did not collapse. FDI can play a major role in the long-run evolution of Baltic enterprises via backward and forward linkages and can strengthen the ability to learn new methods of production from foreign companies. In times of globalization small states are best off with specialization in world markets and the implementation of their own innovations. In the current situation this may take some time and while innovation-driven growth isn’t unleashed immediately, the recovery from crisis is likely to persist. Over the next couple of years the Baltic States may face persistently high levels of unemployment and a worsening in social conditions. To sum up: The Baltic States have to accept negative economic conditions in the short term, in order to benefit from long term sustainable growth.

References

Cosmopolitism, Scientific Discoveries, and Technological Inventions along the Ancient Silk Road: The Role of Samarkand and Bukhara
by Detlev Quintern

Introduction

Although today poor in terms of average income, the part of our world which is presently in the process of economic development possesses a rich cultural heritage. Many regions of today’s developing world were home to people who played an important role in the discovery and preservation of scientific insights and in the invention and transmission of technological devices. Particularly prolific in this respect were those regions, where the people did not insulate themselves but became drivers of cross-border relations, and especially, where this drive was not restricted to trade, but was also extended to be open to the world of foreign ideas and new developments in the cultural sphere, such as philosophy and the fine arts. An outstanding example for the positive interrelation between trade, cosmopolitism, scientific discoveries and technological inventions are the oases along the Ancient Silk Road, which linked China with Europe – especially the cities of Samarkand and Bukhara in today’s Uzbekistan.

While the general history of the Silk Road trade has been investigated in numerous studies, such as the most recent work by Xinru Liu (2010), this contribution will particularly outline the historic significance of Samarkand and Bukhara as centers of knowledge transfer in the Islamic period, focusing on the interplay of cross-cultural exchange with scientific innovation in the Islamic heydays of the two cities.
The Silk Road

The Silk Road of Central Asia (which was paralleled by a similar system of trading routes across the South China Sea and the Indian Ocean), was a system of commercial routes linking various traders’ communities who organized themselves into caravans carrying goods (such as silk textiles, jade, ceramics, porcelain) on pack animals. With its ability to stand extreme and changing climates, the Bactrian camel became a guarantee for the success of this long-distance trade. The transport of silk and other commodities along the Central Asian caravan routes from China to the Mediterranean began to flourish during China’s Han-Dynasty (206 BCE – 220 CE) and the simultaneous heydays of the Roman Empire. The history of the Silk Road serves as a good illustration of the relationship between the spatial (geographical-natural) dimension of trading centers (oases), transport and innovation. In the arid zones of Central Asia oases were the sole water resources not only for agriculture but also for the immense water supply the large caravans needed. Here, before continuing their exhausting journey, a camel drank up to hundred liters of water in a short time. Here, also trading sites (in Arabic: funduq) were installed, as part of the caravanserai, a compound with a hostel for the traders and their animals, storage buildings for merchandise, offices, and often houses for prayer (temple, mosque).

In the first century CE large quantities of silk were delivered to Roman markets. The Nabataean city of Petra, later the cities of Palmyra, Antioch (near today’s Antakya in Turkey) and Gaza became the easternmost entrances to the Roman market, where also frankincense and myrrh arrived from Arabia Felix (a region including modern Yemen) or Punt (in today’s Somalia).

Important inventions and scientific discoveries

During the first millennium of the Christian Era, a number of technical inventions found their way from China to the West, including the nautical compass (along the sea routes of the Indian Ocean) and the process of distillation. Of utmost importance, however, was the invention of paper making, for which Samarkand and Bukhara played an important role in the East-Western knowledge transfer.

The oases of Samarkand and Bukhara are located in the land between the rivers Amu and Syr which both flow westwards into the Aral Sea. Samarkand and Bukhara are two of the oldest cities of the world. Especially during the Sogdian period (from the 2nd to the 10th century CE), these oases became prominent trading sites, and the Sogdian language (of the Eastern Iranian language family) became the main commercial language of this part of the Silk Road (Liu 2010, p. 68). Both cities flourished again in the Islamic period.
The oasis cities of Bukhara and Samarkand manifest different layers of culture and beliefs, enriching the cosmopolitanism of these crossroad cities. As Buddhist pilgrims often accompanied trade caravans, installing monasteries along the Silk Road, we find in Bukhara, for example, Buddhist fundamentals below what are nowadays mosques. Certain Islamic practices of Sufism trace back to shamanism, such as to write magical sayings or Koranic verses on paper. Paper, while burning it, serves in the Far East till today for communication with ancestors.

The Chala, a former Jewish community, converted to Islam and coexisted alongside the Jews in Bukhara. A culture of tolerance is inscribed in several historical monuments, like the Samanid mausoleum from the 10th century in Bukhara. Beside Islamic motives it also shows Buddhist and Zoroastrian ones. As Samarkand and Bukhara had been crossroads of ideas it seems to be obvious that flourishing trans-cultural was stimulating the adaption of traveling scientific inventions like silk culture or paper making. Any restrictions as we do find in nowadays intellectual property rights were unknown. The openness towards cultures, beliefs and ways of thinking was a guarantee not only for peace but also for transmitting the non-material treasures of knowledge and scientific inventions.

The “Bukhara Project – Cosmopolitanism and the City” is currently researching the Central Asian model of coexistence (www.cambridge-centralasia.org). Taking up this approach, the question arises as to whether there is an impact of cosmopolitan harmony and rationally-oriented belief on scientific innovation.

Arabic-Islamic envoys came to China in 651 CE, and may have already gained knowledge of papermaking at that time. The Sogdian capital Afrasiab (Markanda), today’s Samarkand, was conquered by the Arabs in 712 CE. However, after the battle of Talas, a river in today’s Kirgistan, in 751, Islam spread in Central Asia. The Chinese Tang Dynasty had been defeated by the army of the early Abbasid Caliphate under general Ziad Ibn Salih (Bosworth 1977, p. 3). Perhaps simply to stress the historic break, legend has it that Chinese prisoners of war, now employed in Samarkand, brought the technology of paper production via the Silk Road to the Arabic-Islamic Civilization, which began to emerge with Baghdad as its capital. The land between the rivers Amu and Syr (Transoxiania) was inhabited, populated in part by nomadic Turks linked to specific shamanistic views of being, and Sogdians, speaking eastern Persian, some of whom oriented towards Buddhism while others were preachers of Manichaeism (Liu 2010: 69). A Jewish community probably derived from the semi-nomadic Khazars whose elite among a Uighur federation might once have converted to Judaism (Minorsky 1978: 125). Nestorian Christians found their way to China via the Silk Road. Samarkand and Bukhara had been a crossroads of different and overlapping beliefs and cosmologies, when Islam first spread among the population of the oasis cities.
With the stabilizing of the Abbasid Caliphate at the end of the 9th century in the time of the famous Harun al-Rashid, known from many stories of the Thousand and One Nights, Islam particularly flourished under the philosophical school of the Mu’atazila which unfolded the rational dimension in Islamic spirituality. The ethical orientation towards knowledge, whatever its origins (Coptic, Syrian, Greek, Indian etc.), and its inculturation via translation into Arabic was the driving force behind the scientific revolution taking place during the Abbasid Caliphate (750-1258).

The science historian George Sarton saw in the experimental orientation of Arabic-Islamic science, to which Greek science contributed only little, a breakthrough to modern science: “Perhaps the main, as well the least obvious, achievement of the middle ages, was the creation of the experimental spirit, or more exactly its slow incubation. This was primarily due to the Muslims down to the end of the twelfth century, then to the Christians. Thus in this essential respect, East and West cooperated like brothers. However much one may admire Greek science, one must recognize that it was sadly deficient with regard to this (experimental) point of view which turned out to be the fundamental point of view of modern sciences.” (Sarton 1969: 99)

Paper is probably one of the most important discoveries of mankind, revolutionizing the quality of information carriers by paving the way for book binding. In the 11th century the Arab historian Abd al-Malik al-Thalibi wrote about paper, produced in Samarkand as a specialty of the city, and its advantages compared with papyrus and parchment used in antiquity. Samarkand became a center for paper production. The quality of the important export commodity was universally recognized and people everywhere used it (Bloom 1999, p. 27).

The etymology of the old Arabic word for paper kaghad, in modern Turkish kagit, is supposed to trace its origin via Uighur and Sogdian to the Chinese root shi (smooth). Earliest archeological excavations brought to light a kind of paper which dates back to the Han emperor Wu Di (140-87 BCE). Later, a huge number of paper rolls with Chinese, Sanskrit, Sogdian, Persian, Uighur, and Tibetan texts were found in the Takla Makan Desert. Some of these texts, such as a Chinese trade letter, go back to the late 3rd / early 4th century CE (Weber 2004, p. 39).

The extensive creation of knowledge, science and literature during the Abbasid Caliphate required an early form of industrial paper production which traveled from Samarkand to Bagdad. In the metropolitan city with around 400,000 inhabitants, book markets surrounded the warraqiyun, a guild whose members specialized in all kinds of arts and crafts related to book production (papermaking, calligraphy, miniature painting, etc.). The increasing demand for books paralleled the establishment of libraries (maktaba). In the mid-12th century the technology of paper making reached
Al-Andalus on the Iberian Peninsula via the Arabic-Islamic knowledge routes.

Often libraries were linked to high schools and universities (madrasa), which brought forth famous scientists and philosophers like Ibn Sina (lat. Avicenna, 980-1037 CE) (philosophy, medicine, psychology), who grew up in Bukhara. These historic institutions are part of the cities’ world cultural heritage today.

The opus of Ibn Sina, *kanun fi tibb* (canon of medicine) was also the basic medical literature in Europe until the early 20th century and is currently being rediscovered by recent approaches in medicine.

There are many more scientists along the Silk Road to list, who, like Biruni (973-1043 CE) (mathematics, astronomy, geography / geodesy, pharmacy, ethnography) from Kath, enriched the knowledge of mankind with scientific revolutions, for example, ascertaining nearly the exact circumference of the earth. Founding modern trigonometry, he developed sine, cosine and trigonometric tables, which were later transferred to the west (Al-Hassani 2007: 69):

“The Determination of the Coordinates of Cities was the first in the history of the field to determine accurate geographic locales with the techniques of spherical trigonometry. His exacting approach was designed to replace the difficult and less reliable method then in widespread use for the determining differences in longitude: the simultaneous observation of a lunar eclipse from two distinct points.” (Lyons 2009, p.85).

The correspondence between Ibn Sina and Biruni discussed the specific density of water or minerals, the vacuum, the principles of different climates etc. (Al-Biruni 1991). Their scientific approach followed the experimental methods (Strohmeier 2007: 25). Ibn Sina and Biruni worked during the reign of the Samanids (900-1000 CE) and the emerging of the Turkish Seljuks. Bukhara was the capital of the Samanid State which extended to the vast historical region of Chorasan (modern Uzbekistan, Turkmenistan, Tadzhikistan, Afghanistan, and Iran). The Samanids traded as far as Northern Europe. The silver coins which are found all around the Baltic and even in the North Sea are often of Samanid origin (Brentjes 1977: 92).
References

Bosworth, C. E. (1977), The medieval History of Iran, Afghanistan and Central Asia, London
Minorsky, V. (1978), The Turks, Iran and the Caucasus in the Middle Ages, London.
www.cambridge-centralasia.org
www.nytimes.com/2011/03/08/arts/08iht-signshow08.html
Constraints and Potentials of Processing Cashew Nuts in Nigeria

by Osmund Osinachi Uzor

Introduction

Cashew has become an important export crop and major source of income to many smallholder farmers in Nigeria. In 2008, cashew contributed approximately USD 12 mill. to Nigeria’s exports (FAO 2008). It has a high nutritional value and can serve as raw material in pharmaceutical industry. Furthermore, cashew tree play an important role in soil erosion control and contribute immensely in the preservation of biodiversity. Historically, cashew tree originated from a short-growing ecotype Anacardium occidentale, L. in low vegetation of the coastal north-eastern part of Brazil. Cashew fruit was introduced in Africa probably between the 15th and 16th century by the Portuguese but grew in the wild (Azam-Ali / Judge 2001, Hammed et al. 2008).

The evolution of cashew cultivation in Nigeria dates back to the 1950s. The tree was massively planted by the former Eastern Nigerian government as basic measure to control erosion in the escarpment areas of the region. About 800 hectares of cashew plantation were cultivated in the present Enugu State in 1954. Subsequently, about 200 hectares were planted in Ibadan by the former Western Nigeria government (Ezeagu 2002). Analysing the constraints and potentials of cashew processing is an important step towards finding ways to improve the productivity in the sector and promote a sustainable development of the Nigerian economy.

Nigeria’s share in world cashew production

The impact of cashew nuts on the Nigerian economy became prominent after the deregulation policy of 1986. The policy created
Since the 1990s, there has been a considerable increase in demand for raw cashew nuts in the world market. This has contributed to a steady increase in production and a rise in cashew nuts share in Nigeria's exports. The contribution of cashew nuts and edible fruits to Nigeria's non-oil exports increased from 4.12 per cent in 2006 to 5.43 per cent in 2007. However, it declined to 3.0 per cent in 2008 as a result of a price shock and increasing local demand (NEPC 2010). Over half of the cashew production in Africa between 2005 and 2008 came from Nigeria. The ratio of Nigeria's cashew production to the World output increased from about 5 per cent in 1990 to about 18 per cent in 2005. This suggests that cashew nuts have become a major source of Nigerian non-oil export earnings. It also implies that the sub-sector has the potential to support sustainable development and Nigeria’s export diversification efforts.

Cashew producing areas in Nigeria are grouped into major and minor producing areas. The minor areas are concentrated in South-West, South-South and Northern states, while the major producing area are the South-Eastern states of Nigeria (Aikpokpodion et al. 2009). The total area of land planted with cashew in Nigeria is app. 570,000 hectares (CBN 2007, Asogwa et al. 2008).

Factors limiting effective cashew cultivation and processing in Nigeria

There are several limiting factors affecting effective cashew cultivation and processing in Nigeria. The factors can be classified into three groups: supply-side factors, demand-side factors, and institutional factors.

Supply-side factors include barriers to an effective cultivation and processing of cashew nuts as well as transport issues.

Generally, like other cash crops also cashew production was neglected in the period prior to market deregulation. Most trees planted in the 1950s have been over-aged while others grow wild. Production is also negatively affected by a rapid deforestation and an increasing use of cashew wood as source of energy for households. Also, large-scale farming especially in Southern Nigeria is constrained by land acquisition problems.

Deficiency of soil nutrient contributes to low yields and poor quality. The nutritional contents of the soil are often washed away during the raining season. Farmers have little or no access to fertilizers. Regrettably, inadequate research funding also limits research activities on how to improve productivity (Hammed et al. 2008).

Absence of good storage facilities for raw nuts has contributed to losses and deteriorating product quality. In general, the dominance of smallholders has limited the opportunities for large-scale production. The smallholders and the small-scale processing units have also limited access to investment capital to purchase modern equipment.
In addition, a poor transportation system as a result of bad access roads to the rural areas limits farmers’ access to larger market. Consequently, farmers have no option but to sale at very low farm-gate price to traders.

The second group of factors are demand-side limitations. These are factors limiting farmers’ income, the private consumption of cashew, and investment in cashew production. Unstable price in local and international markets tend to discourage farmers to embark on intensive cultivation. Low farm-gate prices of raw cashew nuts have contributed to increasing numbers of entries in informal small-scale processing of cashew nuts. This has resulted to an increasing number of informal road-side sellers of locally processed cashew nuts.

An increasing number of informal small-scale processing has led to downward pressure on consumer prices. To maximise income, cartel formation among by the road-side sellers in terms of price fixing has emerged, thereby reducing competition and raising consumer prices without improving quality. This also limits export chances for processed cashew nuts from Nigeria due to poor processing and low product quality.

Further limiting factors are the institutional weaknesses. There have been policy inconsistencies regarding strategies on how to promote cashew processing industries. Instability in relative prices has limited opportunities and incentives for private sector investment in the sector. In general, the public lacks an awareness of the potentials of cashew products in the economy. Hence, there is need for institutional capacity building for stakeholders in the cashew sub-sector in Nigeria.

Potentials of cashew processing in Nigeria

In the past, little attention was given to cashew processing in Nigerian which resulted to a poor exploitation of its potentials in the economy. Upgrading the local processing capacity and promoting value addition in the sector should have been an important development strategy. The idea of upgrading in this context refers to improving the production methods, make better products more efficiently or move into higher-skilled activities similar to arguments in literature on competitiveness (Porter 1990, Kaplinsky 2000). Upgrading the cashew sub-sector along the value chains can take different forms. The necessary steps are to upgrade the production volume by increasing cultivation, creating a good business environment to attract investment in the sector and packaging of processed nuts for final consumers. Upgrading the cashew sector also involves ways to improve the organizational structure for international cashew supply chains. The implicit impact of upgrading or improved value addition in the sector can be reflected on increased rural and urban employment, increased household and national incomes. Upgrading Nigeria’s cashew sector will explicitly offer leverage in the economic diversification efforts and improve the country’s terms of trade in the non-oil sector.
Besides the economic values of the cashew, there are substantial social impacts of cashew on peoples’ lives. For examples, the by-products of cashew such as cashew butter, cashew nut shell liquid and Vitamin C-rich juice have high food nutrients. Cashew is rich in unsaturated fatty acid with high protein, lower blood cholesterol and low level saturated fats and soluble sugar (Hammed et al. 2008). Promoting cashew processing would contribute to Nigeria’s poverty reduction efforts by supporting diversification of rural employment and income. Farmers can be employed in the cashew processing factory located in rural areas thereby reducing the rural-to-urban migration.

Cashew is a drought resistant tree and has a natural potential in preserving the biodiversity. Environmental damage from cashew production is considered to be less relative to other agricultural products such as palm oil or rubber production. This suggests that the negative impact of cashew production on natural forests can be low. In other words, the present high world market prices of cashew could be attractive for farmers to increase their plantations into natural forests.

Addressing the Challenges

Nigeria faces enormous challenges in combating poverty by increasing agricultural productivity, reducing mounting youth unemployment and at the same time preserving biodiversity. This paper argues that agro-processing is one of the key instruments in mitigating these challenges and achieving sustainable development. Promoting agribusiness using cashew sector as an example could be an important step in this direction. Two challenges are eminent here: first, is to upgrade or improve productivity for economic and social gains. The advantage is to capture higher value added in the cashew sub-sector; second, is to encourage diversification of the economy, at the same time preserve the biodiversity.

Cashew processing plants are often located in semi-urban areas. To attract local and foreign investment in the sub-sector, infrastructure plays an important role. Investment on electricity, communication and transportation system, and access roads to rural areas are vital for effective cashew processing. In general, making the sub-sector attractive will not only support employment creating opportunities especially for women and youths but also encourage research on how to reduce the knowledge gap for technological adaptation in the sub-sector. Reforming Nigeria’s Land Use Act could support cashew production increase. This will improve farmers’ access to land for increased plantation of cashew trees.
References


Bass, Hans H., Trading out of Poverty? Challenges and chances of globalisation for one of the world’s poorest countries (Mali) and its cotton industry, in: Instytut Handlu Zagranicznego Uniwersytetu Gdańskiego, Wyzwania gospodarki globalnej, 28/1 Gdańsk: Fundacja Rozwoju Uniwersytetu Gdańskiego (Universitätsverlag Danzig) 2010, pp. 201-212.


Quintern, Detlev, Istanbul’s potentials as a cultural capital – the renaissance of Arabic-Ottoman-Islamic cultural heritage, in: Habib Saidi/Sylvie Sagnes (Eds.), Capitales et patrimoine au XXIème siècle, Québec: Presses de l’Université Laval (forthcoming).

Quintern, Detlev, Crossing the spatiotemporal Dimension of Human Culture. Moral Sense in the Fable of the


Quintern, Detlev, Horizonte eines neuen Humanismus, Ihwan as-Safa interkulturell gelesen, Nordhausen 2010: Bautz.


Conference Presentation and Media Resonance, 2009-2011


Bass, Hans H., Der Einfluss der Indexspekulation auf die Preisbildung bei Nahrungsmitteln, Workshop der Deutschen Welthungerhilfe e.V., 28 March 2011.


Niemeier, Hans-Martin, Alitalia – the political economy of a failing national


Niemeier, Hans-Martin, Regulation ADP Airports – A Preliminary Economic Assessment, Strategy and Regulation of Airport Charges, GARS Workshop at the Université Paris Panthéon-Sorbonne, 01 February 2010.

Niemeier, Hans-Martin, Price Cap Regulation of Airports in Continental Europe – an Overview, Strategy and Regulation of Airport Charges, GARS Workshop at the Université Paris Panthéon-Sorbonne, 01 February 2010.


Quintern, Detlev, Istanbul’s Potentials as a Cultural Capital: The Renaissance of Arabic-Ottoman-Islamic Cultural Heritage, Colloque international, CAPITALES ET PATRIMOINE AU XXIe SIÈCLE, Québec, 5-7 novembre 2009, Université Laval (Vieux-Québec) Québec, Québec, organisé conjointement par : l’Institut du patrimoine culturel (IPAC), le Centre interuniversitaire d’études sur les lettres, les arts et les traditions (CELAT) et le Laboratoire d’anthropologie et d’histoire de l’Institution de la culture (LAHIc), Sous la direction de Habib Saidi (IPAC et CELAT, Université Laval) et Sylvie Sagnes (CNRS – IIAc, Équipe LAHIc, Paris), 5-7 novembre 2009.

Quintern, Detlev, Crossing the spatio-temporal dimension of human culture. Moral sense of justice in the fable of the ringdove, Poetic Expressions: Saying the Same in different Ways Beauty, Sublime, Creativity in Islamic and Occidental Culture, 13-14 August 2009, Center for Advanced Studie / The Center for the Promotion of Cross-Cultural Understanding, Harvard University, Cambridge, MA

Quintern, Detlev, Traditions and Transformations, Tourism, Heritage and Cultural Change in the Middle East and North Africa Region, 4-7 April 2009, Amman, Jordan, organized by Leeds Metropolitan University, UK and the Council for British Research in the Levant, Jordan.
Graduation Theses Supervised by ITD-Members, 2009-2001

**Diploma Theses**


Bostancilar, Sevdiye, Die Weltwirtschaftskrise von 1929 und mögliche Lehren für die globale Krise von 2009, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Hellmers, Julia, Allianzen vs. Fusionen im Passagierluftverkehr. Eine vergleichende Analyse, Bremen 2010 (Supervisor: Prof. Dr. Niemeier).

Khitretsova, Anastasia, Innovationspolitik in Israel: Entwicklung, Instrumente und Perspektiven, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Liegel, Oliver, Die nationalen Innovationssysteme Deutschlands und Schwedens unter besonderer Berücksichtigung des Biotechnologiesektors, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Putensen, Maren, Das Allgemeine Präferenzsystem der EU als Chance für wachsende Entwicklungsländerexporte?, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Schitkow, Roman, Die Bedeutung von Unternehmensfusionen im Rahmen grenzüberschreitender Investitionen, Bremen 2009 (Supervisor: Prof. Dr. Bass).

**Master Theses**

Boeckhoff, Jan, Die Feststellung und Beurteilung von Wettbewerbszwängen und Marktmacht in der Flughafenindustrie am Beispiel des Londoner Flughafen Stansted, Bremen 2010 (Supervisor: Prof. Dr. Niemeier).

Bui Thi Xuan Hoa, Price structure of airports: a constraint to capacity utilization, Bremen 2009 (Supervisor: Prof. Dr. Niemeier).

Leon, Juan, Die Bedeutung des Exports für die deutsche Wirtschaft, Bremen 2010 (Supervisor: Prof. Dr. Bass).
Bachelor Theses


Bachmann, Oksana, Flughafenprivatisierung in den osteuropäischen Ländern unter besonderer Berücksichtigung des Budapest Ferihegy International Airport, Bremen 2010 (Supervisor: Prof. Dr. Niemeier).

Prühn, Christoph, Reforms of UK airport regulation, Bremen 2010 (Supervisor: Prof. Dr. Niemeier).


Bock, Andrea, Brazil’s Role in World Climate Policy, Bremen 2010 (Supervisor: Prof. Dr. Bass).

Boeckhoff, Jan, Theoretische und praktische Aspekte der Kapitalkostenbestimmung an regulierten Flughäfen, Bremen 2009 (Supervisor: Prof. Dr. Niemeier).


Hillmann, Anna Barbara, Die Evaluationspraxis der Entwicklungszusammenarbeit in Deutschland, Bremen 2010 (Supervisor: Prof. Dr. Bass).
Kammesheidt, Anne, Das Projekt Otjivero – ein neuer Ansatz der Entwicklungspolitik in Namibia: Entwicklungsökonomische Voraussetzungen und Implikationen eines bedingungslosen Grundeinkommens, Bremen 2010 (Supervisor: Prof. Dr. Bass).

Köbinger, Fabian, Die Bedeutung Russlands und anderer GUS-Mitglieder für die Energieversorgung der Europäischen Union, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Kristiansen, Knut Felix Krisitan, Der Beitrag der Außenwirtschaft zum Entwicklungsprozess im Lichte neuerer entwicklungsökonomischer Theorien, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Lechmann, Malte, Economies of scale and scope and their application to the airport industry, Bremen 2010 (Supervisor: Prof. Dr. Niemeier).

Meyer, Christian, Relative wirtschaftliche Performance ausgewählter deutscher Regionalflughäfen, Bremen 2010 (Supervisor: Prof. Dr. Niemeier).

Morgan, Molley (2010), Der zivile Luftverkehr in Europa – Wettbewerbs- und Reaktionsstrategien von Full Service Airlines, Bremen 2010 (Supervisor: Prof. Dr. Niemeier).

Nguyen Thanh Trung, Success Factors for Export-Oriented SMEs in Vietnam, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Nievers, Anna Maria, Die Erste Globalisierung aus Sicht der modernen Unternehmensgeschichte am Beispiel der Nordwolle Delmenhorst, Bremen 2010 (Supervisor: Prof. Dr. Bass).

Rojas Ospinas, Maria, Neue internationale, nationale und privatwirtschaftliche Strategien zur Förderung des Entwicklungsbeitrags der Kaffeeproduktion, Bremen 2009 (Supervisor: Prof. Dr. Bass).

Rosenblau, Julia, Causes, Dimensions and Economic Effects of Migration from Mexico to the United States, Bremen 2010 (Supervisor: Prof. Dr. Bass).


Stippkohl, Sebastian, Chinesische Wirtschaftsinteressen in Afrika: Umfang und Perspektive, Bremen 2010 (Supervisor: Prof. Dr. Bass).


Weddelor, Lars, Korruption – Ursachen, Wirkungen und volkswirtschaftlicher Schaden am Beispiel Indonesiens, Bremen 2010 (Supervisor: Prof. Dr. Bass).
Course Location:

Bremen University of Applied Sciences
Target group: Students of all subjects; undergraduate and graduate students with an interest in politics, social sciences, economics, geography.
Date: 6-30 August, 2012

Course content:

This course is for anyone who would like to learn more about fair trade, including

- the role of developing countries in world trade, fairness in trade relations, and the consequences of the present world trade order for producers in developing countries;
- the principles of the fair trade movement, standards, and certification processes;
- empirical social research and market research methods to analyze the impact of fair trade projects on development and to assess the potential of fair trade products in international consumer markets;
- a case-studies based examination of how fair trade can alleviate poverty for artisans and farmers in developing countries;
- different approaches to raise consumers’ consciousness about social and ecological issues in international trade;
- how to find new customers for fair trade products and successfully manage fair trade
- project management and marketing techniques applicable for fair trade businesses.

Teaching methods include lectures, case studies, workshops, and project work. The faculty includes Professors of International Economics, Development Economics, Political Sciences, and Business Administration as well as several representatives of Fair Trade organizations and businesses.

Syllabus Development:

Institute for Transport and Development.

Supported by:

Senator für Umwelt, Bau, Verkehr und Europa (SUBvE) (Ministry of the Environment, City State of Bremen)

Hours per week: 40
Places per course: 25
ECTS-credits: up to 9

Contact and registration:

Ms Uta Kadmani
(International Summer Schools)
Bremen University of Applied Sciences
Werderstraße 73
D-28199 Bremen, Germany
Phone: +49-(0)421 – 59054163
Fax: +49-(0)421 – 59054675
ifk@hs-bremen.de
www.ifk-bremen.de