

Process Analysis

JICA has been trying to find appropriate ways to revisit and deepen analysis on the process through which project outcomes are produced, under the technical guidance of the Advisory Panel on Enhancement of Ex-post Evaluation (see p.7 for more details). We have so far tested this for the projects in India and Kenya on which we applied different analytical approaches. One of them is the “project ethnography” approach. This is a method used to document the implementation process of a development project referring to Ethnography; a method used in anthropology to record findings from the field studies. The “project ethnography” approach involves the reconstruction of “realities of the ground” from diverse perspectives; not only those of project beneficiaries but also various other stakeholders, including donors, and describes the findings in a narrative style. It helps readers to vicariously experience what happened on the ground and to learn practical lessons by themselves.

Hereafter we shed light on the case of “The Delhi Mass Rapid Transport System Project” in India, one of the examples of process analysis using the “project ethnography” approach. To highlight the process of project implementation for the purpose of learning has been a global trend and a shared interest among donor agencies, as exemplified by the Global Delivery Initiative (GDI)*1 led by the World Bank. Our initiatives with Advisory Panel on Enhancement of Ex-post Evaluation also respond to such orientation.

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Process Analysis: Target Projects

	[India] Delhi Mass Rapid Transport System Project	[Kenya] Strengthening Management for Health in Nyanza Province
Scheme	ODA Loans	Technical Cooperation
Sector	Transportation	Health
Cooperation period	February 1997 to present	July 2009 to June 2013

*1: The GDI is a knowledge platform for the international development community. It is an initiative led by the World Bank and participated by the United Nations Development Programme and other multilateral and bilateral donors as well as development research institutions to share the results of systematic analyses focusing on what works, as well as why and how. To be more specific, this initiative aims to classify challenges when implementing development projects (“delivery challenges”), systemize the knowledge required to address such challenges and share it alongside information on personal networks that can help solve them so that development practitioners can access useful knowledge and experts on a timely basis to improve their project implementation.

*2: The JICA Research Institute (JICA-RI) publishes the series of “Project History” comprising books that review JICA projects to analyze their processes and results. Ms. Matsumi has authored one of the books in this series: *Will the Forests Disappear?: A Record of People Devoted to Protecting the Last Remaining Virgin Forest in Ethiopia*. This book uses the “project ethnography” approach to narrate the field-level experience of trials and errors as well as challenges in the Participatory Forest Management Project in Belete-Gera Regional Forest Priority Area (2003-2012; Technical Cooperation).

Process Analysis on “Delhi Mass Rapid Transport System Project” in India

The Delhi Mass Rapid Transport System Project (also known as the Delhi Metro project) in India is noted as one of the most successful ODA projects. This fiscal year, JICA conducted a process analysis focusing on the implementation stage of the project, in addition to the ex-post evaluation of the project (phase 2). We introduced the project ethnography approach to this exercise that involves interviews with a wide range of project stakeholders and collected information on various episodes that we could not pick up through the ex-post evaluation based on the Five DAC Criteria. These episodes reveal the difficulties faced by those involved in the project, the ingenious contrivances to which they resorted and the impacts the project achieved. We present the findings in a storyline so that each reader can draw lessons of their own.

Following are the table of contents and excerpts from the report “Breaking Ground- A Narrative on the Making of Delhi Metro.” This narrative inspires readers to ask themselves the following questions: What did leadership mean to the Delhi Metro project? What shortened the construction period for Delhi Metro and enabled an earlier start of operation

than planned, while those large-scale infrastructure projects tend to be delayed in India? What are the lessons learned from the Calcutta Metro project which is allegedly an unsuccessful case? What transformation is taking place in the life of Delhi citizens?

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Diversion of Utilities: Yumiko Onishi, IC-Net Limited

There were quite a few things that the Delhi Metro project learned to tackle correctly after the agonizing experience in making the Calcutta Metro. Ask any Kolkata resident about those years and they would roll their eyes before describing their ordeal. Take for example, Anisha's mother who grew up with two younger brothers lived in Kolkata until the 1980s. Once the works on the Calcutta Metro started in bits and pieces along the whole stretch, the dug up earth divided the city into half, literally. Her mother would describe it as "Kolkata's open heart surgery." Unfortunately for Kolkata, there was no tunnel boring machine in those days that allowed the contractors to make one big hole in the ground, instead of digging up the entire stretch of the metro corridor, through which a humongous excavation machine would be lowered for boring underground. Technological advancement over the years benefitted the Delhi Metro immensely by reducing public inconvenience.

"We had to walk on wooden planks to cross ditches," said Anisha's mother, remembering the way she had to reach school pulling the hands of her younger siblings. Part of the reason why people were put through such a testing experience was the shifting of underground utilities. To build underground sections of the metro, the ground had to be excavated. Before one could go deeper, there would be a complicated network of water supply and sewerage pipes that needed to be shifted out of the way. Other government agencies in charge of these utilities had to be roped in before Metro Railway Calcutta (the metro project implementing agency, now Kolkata Metro Rail Corporation) could get their hands to it. In some cases, these other agencies were reluctant in such a manner that gaps were left in the ground so as not to actually shift the utilities. Coordination among multiple agencies has never been an easy task in India. While the metro agency had its own timelines, the others worked at their own pace causing inordinate delays.

Engineers at DMRC were well aware of the fallouts from the Calcutta experience. The current managing director, Mangu Singh, had worked on the Calcutta Metro project in the past. It was based on this experience that Sreedharan insisted Mangu Singh to join DMRC. Waiting for someone else who had no stake in the project would not yield fruit. Instead of requesting the utility owning agencies to shift the pipes and wires, DMRC decided to take the responsibility upon themselves. Singh recollects how other

agencies initially resisted this new found idea. After all, it is their property, their territory and they had their own traditional way of working things.

After much persuasion a compromise was reached. The fact that DMRC was staffed by Indian Railways engineers helped convince the other agencies. DMRC would be in control of the diversion work, but would involve the other agencies in preparation of detailed drawings and approvals would be sought from them. During the execution, if they so desired, they could supervise the works. Besides, the contractors who were experienced with other agencies would be used. To make things smooth, DMRC at times recruited retired personnel from utility owning agencies who would liaise with their old colleagues. This way, civil contractors of Delhi Metro would not suffer, by having their machines lying idle on the side, waiting for the utility diversion to be implemented.

The benefit of shifting utilities on their own not only advanced the speed of work, this way, DMRC could make sure that the public would be least disturbed. The first few instances, where the utility owning agencies agreed, were used to demonstrate the capability of DMRC. Having directly witnessed DMRC's competence, other agencies too gained confidence in DMRC. In one instance, a 1.2 m water main needed to be diverted. It was supplying water to 500,000 people. Where the water supply agency would normally take 48 hours to complete a similar undertaking, DMRC did it in 12 hours. The motivation behind was fairly simple: on the account of Delhi Metro work, people should not be inconvenienced.



Assembling of a tunnel boring machine

A Challenge to ODA Project Ethnography: Hiroshi Sato, Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO)

As an ODA implementing agency, JICA not only undertakes various projects in developing countries to alleviate global poverty and ensure universal human security but also strives to fulfill its accountability to taxpayers and increase its presence in the international development community. It is important for JICA to evaluate its projects to confirm whether they were really effective. Even so, some say that evaluation reports are considered "boring" and "rarely read." While such comments are unavoidable to some extent, it is nevertheless regrettable that many impressive episodes that describe how Japan's ODA has contributed remain unknown to many in Japan and the recipient countries. One good example is the Delhi Metro project.

JICA newly adopted the "ethnography" approach, often used in cultural anthropology. The analysis through this approach itself was a new "project" for JICA. How did readers perceive this report? One may not find it to be an evaluation report, but rather a novel. The report may also receive criticism from those who stress upon evidence/science-based evaluations. However, no matter how rigorously one quests for objectivity using numerical evidence, there are stories that a third-person cannot tell. The very "stories" have the power and resonate in the heart of people who wish to assist developing countries. I hope more and more people will ask for ODA project ethnography and an ambitious attempt of this kind will continue in the future.

Meta-Analysis of Lessons Learned

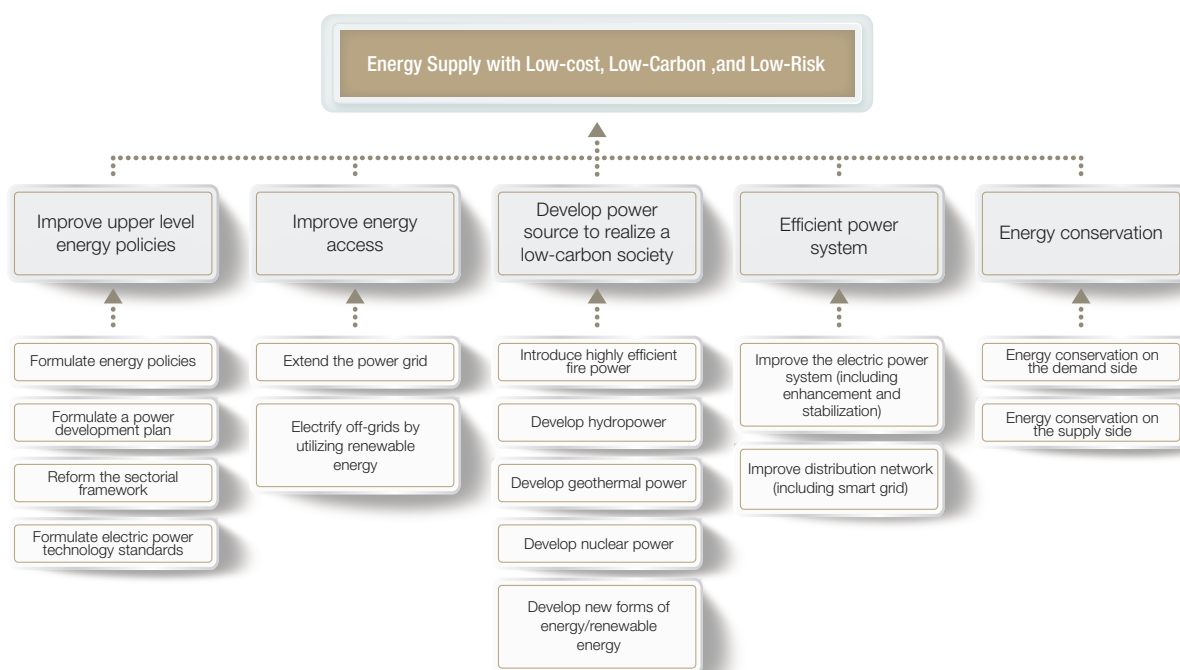
~ Extraction of practical lessons for the energy sector ~

In FY2016, JICA conducted meta-analysis (to extract “knowledge lessons”) in the energy sector via the flow shown below. First, the Industrial Development and Public Policy Department of JICA played a central role in selecting around 400 projects implemented under three assistance schemes (Technical Cooperation, ODA Loans and Grant Aid). Subsequently, we analyzed lessons learned from the projects under each scheme based on a schematic diagram of the development issues. This analysis underwent a total of four taskforce meetings; consisting of evaluation consultants, staff from the Industrial Development and Public Policy Department and Evaluation Department. Eventually, through the scrutiny of sector experts who used to have engaged in the JICA projects in the energy sector, 19 lessons were extracted as follows:



Flow of extracting lessons

In creating the “knowledge lessons sheets” for the energy sector, we revised the format by adding fields to show the applicable schemes and stages for each knowledge lesson, based on the comments from the operational department who would be the main user, so as to ensure users would easily recognize an appropriate schemes and timing to apply. It is expected these improvements will help facilitate smooth browsing of the knowledge lessons through sorting them by the schemes and stages, thus boosting the further utilization of knowledge lessons.



Reference: Schematic diagram of the development issues

Source: JICA's Strategy Paper for Energy Sector, May 2013

Results of Meta-Analysis in the Energy Sector

A total of 19 knowledge lessons sheets were developed through extracting lessons learned from Technical Cooperation, ODA Loan and Grant Aid projects. Specific considerations and countermeasures were suggested for each lesson as shown in the following examples

List of Titles

Lesson	Title	Lesson	Title
1	Confirmation of institutional framework and responsibility of implementing agency	11	Consistency between preparation of up to downstream facilities in the grid
2	Common understanding and construction of a cooperative system among multiple stakeholders in the partner country	12	Scheduling to avoid delay
3	Appropriate project design and monitoring	13	Preliminary analyses—risk assessment and examination of alternatives
4	Confirmation of legal framework on energy conservation, technical standards on electric power facilities	14	Prior written agreement on important matters in project implementation
5	Smooth implementation of technical cooperation by contracted consultant team	15	Secure stable supply of inexpensive fuel
6	Timely procurement of equipment for training and research	16	Risk hedge of private investment part and promotion of private investment
7	Provision of incentives to trainees of training program	17	Effective rural electrification and small-scale decentralized sub-projects
8	Coordination between ODA Loan, Grant Aid, Technical Cooperation and training programs etc. (Continuous assistance)	18	Effective countermeasures for environmental and social consideration
9	Step by step assistance with clear priority to country under rebuilding	19	Consistency and synergy with related development projects including these other than energy
10	Timely implementation of input of the Executing Agency		

Examples of Lessons Learned

Lesson 1	Confirmation of institutional framework and responsibility of the implementing agency	Lesson 4	Confirmation of legal framework on energy conservation, technical standards on electric power facilities
Applicable cases	All projects	Applicable cases	Technical cooperation projects on establishment of legal framework of energy conservation and technical standards on electric power supply and enhancement of executing the legal framework.
Risks	The institutional framework and responsibility of the regulatory institution may not be clearly defined in countries where power sector reform such as debundling of electric power sector was implemented. There is possibility that the institutional framework in charge of power development planning and supervising the implementation of the plan may not be clear, even after establishing the regulatory institution.	Risks	<ul style="list-style-type: none"> Energy conservation measures are not effectively executed without a legal framework. It is difficult to decide the exact project schedule since developing the legal framework is dependent on the political situation and coordination among stakeholders in the host country
Possible measures to be taken	<ul style="list-style-type: none"> JICA should identify the institution in charge of power development planning and managing the plan. JICA conducts a sector survey to confirm the institutional framework and its capacity, if JICA did not identify such institution. 	Possible measures to be taken	<ul style="list-style-type: none"> JICA needs to consider necessary amendments to the scope and schedule of technical cooperation project flexibly to respond on a timely basis to progress in establishing the legal framework in case of a technical cooperation project to assist with this. To provide a technical cooperation project to respond to progress in establishing the legal framework, JICA needs to consider the timely provision of such technical cooperation projects in a step-by-step manner following progress made in the same area. JICA should consider including the establishment of a legal framework of technical standards on electric power supply as a project indicator as much as possible since further effective dissemination of the standards is expected once the standards become mandatory by law.
Lesson 11	Consistency between preparation of up to downstream facilities in the grid	Lesson 15	Secure stable supply of inexpensive fuel
Applicable cases	All financial assistance projects	Applicable cases	Energy supply facilities projects requiring fuel and raw materials (esp., oil, gas and biomass)
Risks	In countries and regions where the power generation capacity is insufficient, even if the power development plan, including the transmission and distribution network of the relevant country, have been thoroughly confirmed at the prior investigation stage, the following risks are considered: <ul style="list-style-type: none"> Even if the rural electrification project is implemented by extending the grid, sufficient power supply will not be carried out due to delays in power development. Electric power supply does not improve, even if the power generation capacity is strengthened due to delays in extending the grid. 	Risks	<ul style="list-style-type: none"> There is a risk that the facility cannot operate as expected unless a sufficient supply of fuel (at a price within a range where profitability is feasible) is made, including unforeseen circumstances.
Possible measures to be taken	<ul style="list-style-type: none"> Prior to financial cooperation to improve transmission and distribution networks in countries or regions where power generation capacity is insufficient absolutely, JICA needs to confirm future prospects, including progress of power development and funding and determine whether to provide grants/loans. In countries where the power generation heavily depends on Independent Power Producers (IPPs), there is a possibility of increased uncertainty, so the connection plan to the power plant concerned must be sufficiently confirmed. In the power plant and substation construction projects, JICA should confirm the construction schedule of the transmission lines connecting these facilities and support construction as necessary. In the project to construct substations and high-voltage transmission lines, JICA should confirm the status of the distribution network. 	Possible measures to be taken	<ul style="list-style-type: none"> Carefully analyze the risk analysis of fuel supply as much as possible. If uncertainty still cannot be eliminated, JICA may consider design changes to the dual fuel type* as well as the possibility of abandoning the project. In anticipation of unforeseen circumstances, take risk measures such as concluding a long-term contract on fuel supply as a prerequisite for implementing the main project, or as a condition for bid/contract consent in the project implementation. Encourage the Executing Agency to undertake cross-sectoral and comprehensive risk analysis.
			*Specifications that can use multiple fuels such as natural gas and crude oil for power generation

JICA's Efforts in Promoting Impact Evaluation

Aiming to further enhance the effectiveness and quality of projects, JICA has been promoting evidence-based practice as well as the implementation of impact evaluation as a major tool for this purpose. Such evaluation is required to assess the effects accurately, especially when a project has little evidence for its effects or when a project is to be scaled up.

Because statistical and econometric methods are used for impact evaluation, a certain degree of understanding of these methods is required to plan and implement the evaluation and utilize its results. Accordingly, JICA has implemented capacity building for evaluators through several training programs.

In those circumstances, the number of projects and sectors covered by JICA's impact evaluation has been expanding every year. The JICA Research Institute, Evaluation Department, and operational departments have conducted impact evaluations in such sectors as health, education, and infrastructure.

Example 1. **The Skills Training and Job Obtainment Support for Social Participation of Ex-Combatants and Other People with Disabilities in Rwanda**

A Quantitative Evaluation of the Impact on Progress in Social Integration and Reconciliation

After the long-lasting civil war at an end, the genocide in 1994 and having resolved its conflicts with the Democratic Republic of the Congo and other neighboring countries, Rwanda faced urgent issues such as the demobilization and reintegration of soldiers. The situation was more severe for those injured in the conflicts, since all the support they could get was limited to medical assistance and rehabilitation equipment. In response, JICA launched a three-year technical cooperation project for the Skills Training and Job Obtainment Support for Social Participation of Ex-Combatants and Other People with Disabilities (hereinafter referred to as "this project") in March 2011 to promote the social integration of demobilized soldiers with disabilities. This project provided skills training for ex-combatants and civilians with disabilities, organized training for Skills Training Center staff and installed barrier-free facilities at the Skills Training Center.

This project was also characterized by its vocational training arrangements. Those demobilized from the Rwandan Defense Force, participated in the training for about six months alongside those from the former Armed Forces of Rwanda that had lasted until 1994, those from the armed groups that had operated outside the country after 1994 and civilians with disabilities. The training results showed, along with several episodes, that not only had it improved the livelihoods of the participants but also contributed unexpectedly to reducing stigma, enhancing mutual understanding between ex-combatants and civilians, and reconciliation. To assess these impacts quantitatively, JICA proceeded to undertake an impact evaluation.

While incomes and employment can be measured rather easily, it is difficult to quantify the changes in mental attitudes of people, such as a sense of discrimination and feelings toward one another. To account for this challenge, outcome indicators

were assessed using the item count technique as one of the indirect survey techniques*¹, as well as applying social psychological approach. The evaluation exploits the fact that the trainees were selected based on their screening test results in regression discontinuity design*² to estimate causal impact of receiving the skills training on these diverse indicators.

The results of the statistical analysis revealed that the skills training had positive impacts on incomes and employment. Moreover, item count technique showed that the percentage of trainees who would feel upset if the former Armed Forces of Rwanda moved to their neighborhood had halved, from 40% to 20% compared to the non-trainees. Although the ex-combatants and civilians who participated in the skills training were both disabled but had very different social backgrounds, training that required them to work side by side by assigning collaborative activities succeeded not only in increasing their incomes but also in changing their attitudes. When considering the complicated historical background of Rwanda, the significance of this impact is clear.

The impact of vocational training on people with disabilities has rarely been evaluated worldwide; therefore, this impact evaluation provided valuable evidence. Moreover, the results also offered significant insights into peacebuilding assistance amid a post-conflict situation where ethnic issues remain unresolved.

*1: When answering sensitive issues such as moral and ethical attitudes and feelings, some respondents may hesitate to give truthful answers. Some may lie or say what they are expected to say. The item count technique uses a questionnaire designed to elicit the necessary information while allowing respondents to conceal their true thoughts.

*2: In regression discontinuity design, beneficiaries and non-beneficiaries near the cutoff are compared to estimate the causal effect of a project when beneficiaries of the project are selected on the basis of whether their score is above or below a cutoff clearly defined by external rules.

Example 2. Project for Enhancing Access and Capacity of EQUITV Program (Phases 1 and 2) in Papua New Guinea

An Analysis of the Impact of the Program Using ICT on Students' Learning

As an archipelagic country comprising nearly 10,000 islands, Papua New Guinea was faced with a shortage of schools and teachers in quantity and quality, particularly in remote areas. To deal with this, JICA launched two Technical Cooperation projects, the Project for Enhancing Quality in Teaching through TV Program and the Project for Enhancing Access and Capacity of EQUITV Program, in December 2006 and April 2012, respectively (hereinafter collectively referred to as "these projects"). These projects developed a video program on mathematics and science for grades 7 and 8 at primary schools (hereinafter referred to as the "EQUITV Program") and aired it on TV or distributed its DVDs to schools.

These projects were highly appreciated by the Government of Papua New Guinea and teachers cited its positive impact on pupils' understanding. Nevertheless, many schools have not adopted the EQUITV Program due to the lack of TVs. Accordingly, JICA decided to evaluate the impact of the EQUITV Program to encourage more schools to install TVs and adopt the program.

The impact evaluation used the fixed effects model^{*3} to compare improvements in students' learning between the intervention group (schools having adopted the EQUITV Program

between 2012 and 2014) and the control group (schools that had not done so). The comparison was made using administrative data (completion exam ("Grade 8 National Exams") results, sex and age) on students in grade 8 between 2011 and 2014 (the students were replaced yearly). Since four years of data were available, the impact of the EQUITV Program was compared between three school groups who had taken the EQUITV method for one, two and three years, respectively.

The results showed that the students at schools who had taken the EQUITV Program for three years tended to perform better in the completion exam^{*4}. The evaluation results also suggested that the more frequently per year the EQUITV Program was used, the greater impact it had on students' performance. These results will be shared with the Government of Papua New Guinea and are expected to encourage schools and communities to adopt the EQUITV Program.

^{*3}: The introduction of EQUITV Program is not randomly assigned but chosen by each school. Therefore, in order to minimize potential biases school fixed effects are added to control each school's characteristics (including unobservable characteristics) that remained unchanged over time.

^{*4}: All the intervention groups tended to get higher scores, regardless of the number of years they had taken the program. In most of the subjects (mathematics, integrated studies and English), however, a statistically significant difference (a 95% level) only emerged among the schools who had taken the EQUITV method for three years.

Presentation on JICA's Impact Evaluations at the Japan Evaluation Society

The Japan Evaluation Society held its 17th annual conference at Hiroshima University from November 26 to 27, 2016. At the conference, JICA organized a session to present its evaluation practices.

The presentation in the session gave an overview of ex-post evaluations JICA had conducted as well as various efforts it had made to improve its evaluation system. Subsequently, the presentation suggested future potential to conduct impact evaluation based on existing data ("real world evaluation") by reviewing recent trends in ever-diversifying evaluation approaches and referring to a case study (See "Example 2. Project for Enhancing Access and Capacity of EQUITV Program in Papua New Guinea). Although an impact evaluation may be costly and time-consuming for those needing to collect data alone, the cost and time can be reduced by using existing data (e.g. data

collected by governments or monitoring ongoing projects). Accordingly, JICA will continue considering the active use of existing data for impact evaluations.

This session was attended by about 30 people (including presenters) engaged in evaluation and/or international development cooperation. The participants discussed various topics, such as the nature of the ideal evaluation model and how JICA can strengthen its evaluation system.



Presentation at the Conference of Japan Evaluation Society

Statistical Analysis on External Evaluations

Since FY2014, JICA has been engaging in statistical analysis of external evaluations to grasp the trends in performance of projects and gain insights from the ratings to improve project design and implementation.

1. An Overview of the Statistical Analysis

► Background

Since FY2009, JICA has conducted ex-post evaluations based on coherent methodologies and criteria, including the Five OECD-DAC Criteria, for all the three assistance schemes of Technical Cooperation, ODA Loan, and Grant Aid. As of FY2015, the number of external evaluations in the meantime reached 923 (refer to p.9 for the rating criteria, main examination items, and rating flowchart for external evaluation).

► Objectives

This statistical analysis aimed to analyze the past external evaluations (quantitatively and qualitatively) to understand their trends and gain insights to improve project design and implementation.

► Subject of this statistical analysis

This statistical analysis was conducted on 923 external evaluations, consisting of evaluations on projects in all three schemes from FY2009 to FY2015*1 and those of ODA Loans from FY2003 to FY2008*2 (i.e. 117 Technical Cooperation, 186 Grant Aid and 620 ODA loan projects).

► Method

The analysis of the trend and distribution of external evaluation results (overall ratings and sub-ratings based on the Five DAC Criteria) was conducted on a total of 923 projects across the three schemes. (Quantitative analysis (descriptive statistics))

* Following FY2015, hypotheses on factors that may influence evaluation results (qualitative analysis (multivariate analysis) is currently being further verified by adding more hypotheses for the analysis.

► Notes

The rating system is a useful tool to assess the performance of development projects and provide hints that helps understand the current situation and ways for improvement. This system is, however, subject to the following constraints: (1) it limits the assessment to the scope of the DAC evaluation Criteria (for example, it does not evaluate aspects like contribution of the donor); (2) it cannot fully capture the different difficulties the project faced, such as the nature of assistance (e.g. necessity of innovations) and project environments (e.g. vulnerability of the recipient country); and (3) it only assesses the results of past activities but does not evaluate the ongoing activities or their future (potential) outputs. Therefore, it should be noted that the rating results do not represent a comprehensive outcome of the development projects. In addition, ODA Loans include Yen Loan and Private Sector Investment Finance, although projects under the latter finance have not yet reached the timing for evaluation. Therefore, it should also be noted that ODA Loans referred to in this analysis mean Yen Loans.

*1: External evaluation target projects with assistance of one billion yen or more and those likely to provide useful lessons learned.

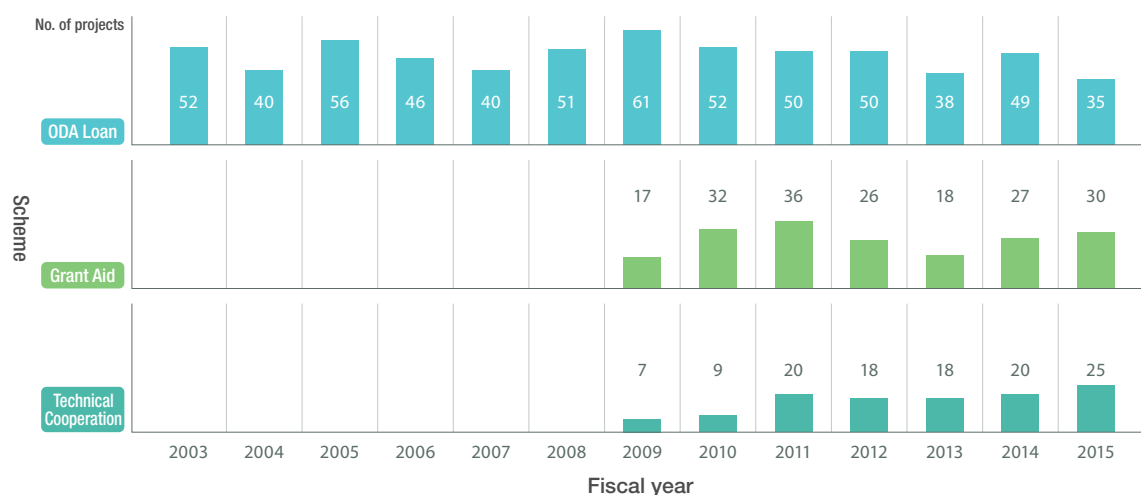
*2: For the ex-post evaluations of ODA Loans conducted by the former Japan Bank for International Cooperation, those with ratings were covered in this analysis.

2. Analysis Results (Descriptive Statistics): Trends and Distributions of External Evaluation

Number of evaluation

The rating system was first adopted for the external evaluation of ODA Loans in FY2003. During the 13 years up to FY 2015, a total of 620 projects (an average of 48 per year) were evaluated. The same evaluation system was introduced to Grant Aid and Technical Cooperation projects from FY2009. To date, a total of 186 Grant Aid projects (an average of 27 per year) and a total of 117 Technical Cooperation projects (an average of 17 per year) were evaluated. The ratio of external evaluations for ODA Loan, Grant Aid, and Technical Cooperation is 67:20:13, respectively.

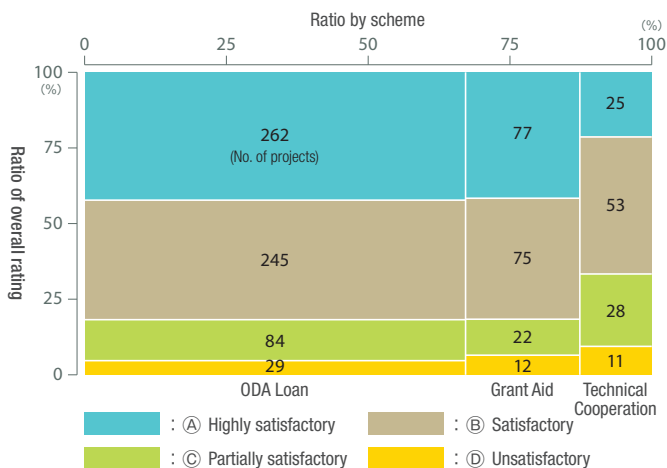
<Figure 1> Transition in the Number of External Evaluations per Fiscal Year by Scheme



Rating Results

Figure 2 is a mosaic profit of the results for overall ratings per scheme. The vertical axis represents the share for each rating, and the horizontal axis the share for each scheme. The figures in the figure show the corresponding number of external evaluations. The width of each column indicates the proportion of the number of ex-post evaluations corresponding to the scheme (for example, that of ODA Loan is the widest and that of Technical Cooperation is the narrowest). The yellow boxes for all three schemes are small, indicating that only a few projects received a rating of "D: unsatisfactory." Figures 3 to 6 also show results for each evaluation criteria in the mosaic profit form.

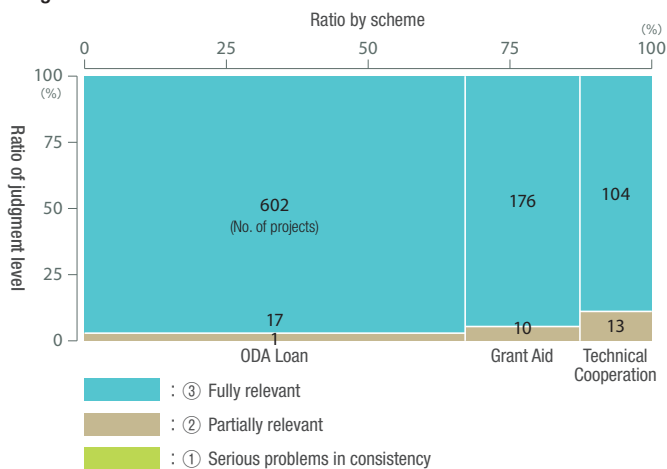
<Figure 2> Results for Overall Rating



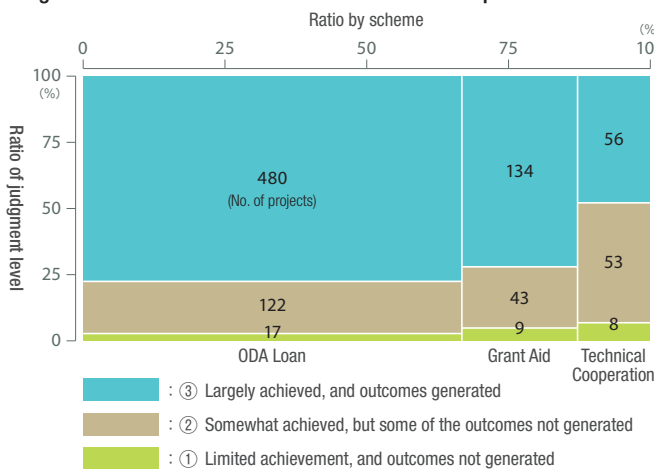
Specific differences among the schemes indicated by these mosaic profits are: efficiency shows the smallest proportion of projects rated ③ in ODA Loan; and sustainability shows a relatively smaller proportion of projects rated ③ in Grant Aid and Technical Cooperation.

Efficiency is evaluated by comparing the actual results against the planned project duration and cost. The duration of ODA Loans tend to be extended since the responsibility of the recipient country such as land acquisition is often included in its evaluation scope. Meanwhile, the sustainability of Grant Aid is shown to be lower than that of ODA Loan because countries receiving Grant Aid tend to have limited technical and financial capacity than those eligible for ODA Loan. A common trend for Technical Cooperation projects can be seen in effectiveness/impact with relatively smaller proportion of ③ ratings. This can be partly explained by the fact that capacity development of human resources or organization is set as the project goal in many Technical Cooperation projects, but there is difficulty in retaining and disseminating their effects after project completion.

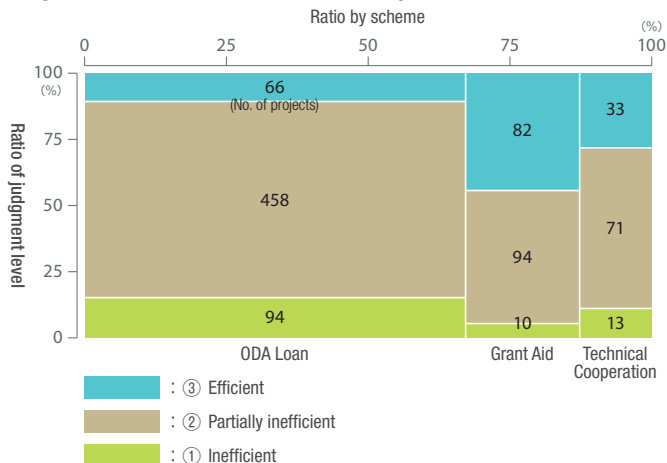
<Figure 3> Evaluation results for Relevance



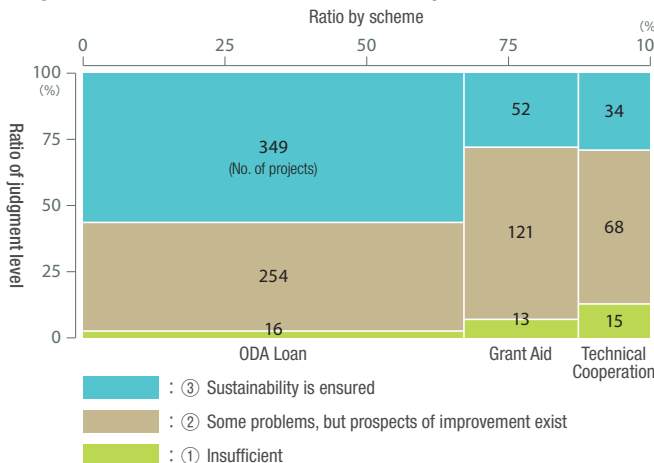
<Figure 4> Evaluation results for Effectiveness / Impact



<Figure 5> Evaluation results for Efficiency



<Figure 6> Evaluation results for Sustainability



3. Trends and Distributions of External Evaluation by Starting Year

In this section, the result of external evaluation shown in “2. Analysis Results” are reorganized focusing on their project commencement year. The heat maps (which represent the number of projects in colors by combining the perspectives shown in the vertical and horizontal axes) in Figures 7 to 10 present the rating results by region and sector. Based on this, the performance of external evaluation and tendency of ratings are analyzed. Here, the target projects range from those having started in 1981, which is commencement year for the oldest external evaluation project, to those in 2008*3 when the new JICA was established (by merger of former Japan Bank for International Cooperation and former JICA). Overall, 618 ODA Loan and 149 Grant Aid projects are covered. Technical Cooperation were excluded because fewer external evaluations were conducted *4.

It should be noted, however, that the following figures do not show the whole picture of JICA projects initiated during the said period*5 as they represent those for which external evaluation was completed and excludes projects that are ongoing or completed but awaiting evaluation.

*3: Since the number of external evaluations is still limited for projects that started after 2009 (2 ODA Loan and 27 Grant Aid projects), they were excluded from the heat maps from the viewpoint of appropriateness.

*4: For Grant Aid projects, among the external evaluations conducted after FY2009 when ex-post evaluation was introduced, the earliest project was commenced in 2001. Therefore, the period from 1981 to 1999 remains blank for Grant Aid projects in all heat maps.

*5: The number of projects awaiting external evaluation increases as the year progresses, and their data is excluded from the figure. Since the project period for ODA Loan is usually longer than those for Grant Aid, many ODA loans that started in the late 2000s are yet to be evaluated at the time of analysis.

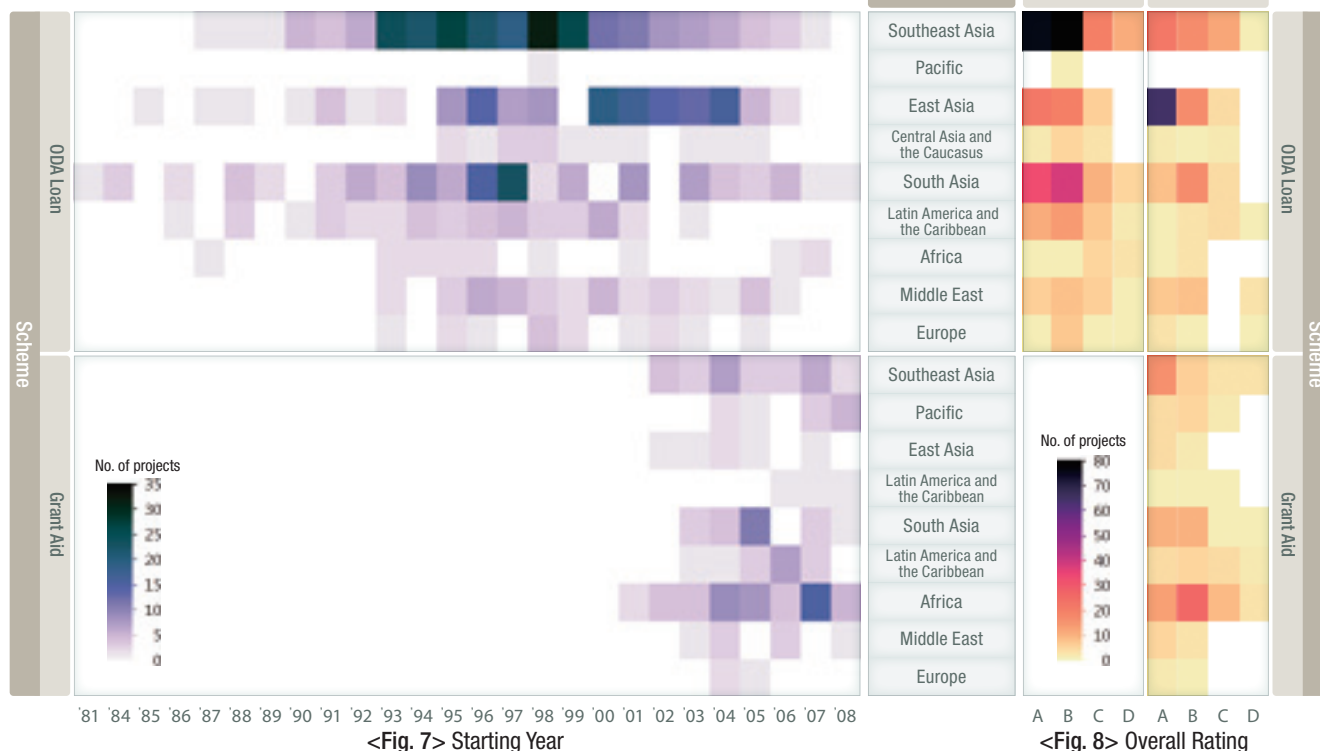
Distribution of Ratings by Region

Figure 7 is a heat map aggregated by region, representing the number of projects by their commencement year while Figure 8 represents the result of overall rating by region with dividing the project commencement year into two periods: (1) from 1981 when the earliest project started to 1999 when former Japan Bank for International Cooperation was established, and (2) from 2000 until 2008 when the new JICA was established*6.

These heat maps clearly show that more ODA Loan projects were implemented in the Asian region throughout the whole period. According to Figure 7, the number of projects were first concentrated in Southeast Asia in the early 1990s and then in South Asia from the late 1990s, followed by East Asia from the 2000s*7. This tendency indicates that the region where JICA provided assistance shifted in accordance with the economic growth in each

region. Regarding Grant Aid projects, many were implemented in the African region. The distribution of ratings by region in Figure 8 indicates more ODA Loan projects were assisted in Southeast Asia, South Asia and East Asia. Although in the case of Southeast Asia, results are distributed among all ratings, overall, the whole Asian region have relatively higher ratings, and the proportions of “A: Highly satisfactory” and “B: Satisfactory” are particularly higher in East Asia. Under the Grant Aid, in Africa and Asia where many projects were implemented, the ratings were mostly high. While in Africa, although the proportion of rating “B” is high, the proportion of “C: Partially satisfactory” is also at a certain level, which suggests that project effectiveness and sustainability may be more difficult to achieve in the African region compared with Asia.

<Figure 7> Distribution of Number of External Evaluations by Starting Year (by Region) *8
<Figure 8> Distribution of Overall Rating (by Region)



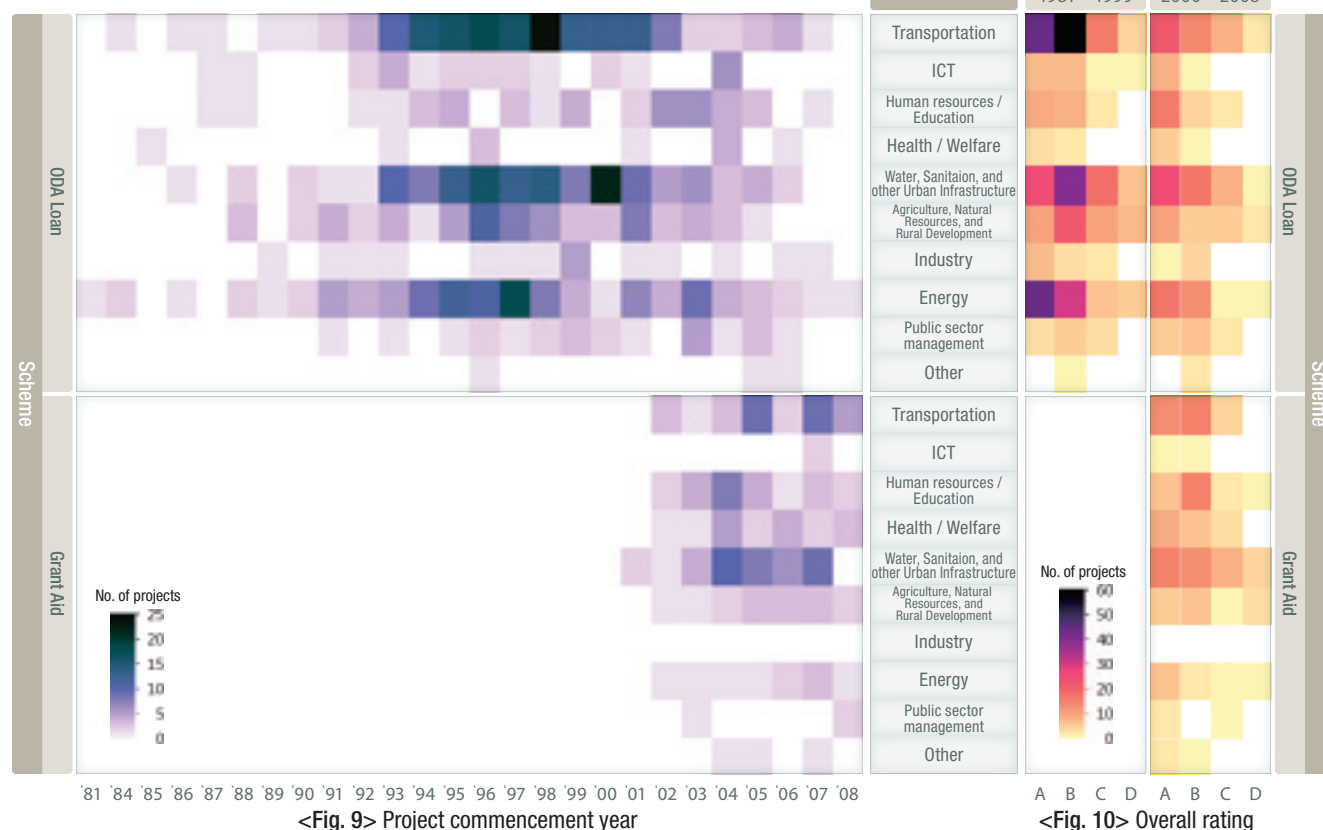
Distribution of Ratings by Sector

Figure 9 is a heat map aggregated by sector representing the number of projects by their commencement year while Figure 10 represents the overall rating, as in Figure 8. According to Figure 9, the proportions of projects for transportation and water, sanitation, and other urban infrastructure sectors are relatively higher under both ODA Loan and Grant Aid, followed by the energy sector, where power sector projects account for a large portion in ODA Loans. Under Grant Aid, the human resources/education sectors account for the second largest. Meanwhile, there are fewer ODA Loan projects in the health/welfare sectors because construction of hospitals and provision of medical equipment are basic infrastructure improvements, and tend to be covered under Grant Aid. Regarding the industry sector, since projects were extended for private sector development or small and medium enterprise financing in terms of loans, evaluation results were only available for ODA Loan projects.

Conversely, the distribution of ratings by sector as shown in Figure 10 indicates a very high concentration of ODA Loan projects rated as "A" in the energy sector, suggests projects under this sector are highly-rated. Similarly, higher ratings are distributed in the transportation and water, sanitation, and other urban infrastructure sectors while a certain number of projects have overall ratings of "C" and "D: Unsatisfactory" as there were many projects implemented. Regarding the tendency for the evaluation criterion for all projects rated "C" or "D," the proportion of sub-rating "③" in effectiveness was confirmed to be small, similarly to the tendency in the mosaic profit for effectiveness in descriptive statistics (p.55); and no differences were acknowledged between the starting years nor sectors. Conversely, efficiency and sustainability were rated "②" in relatively many projects; and it should be noted that there were no projects commenced after 2000 rated "①" for sustainability in their ex-post evaluation.

For Grant Aid scheme, the number of projects in the transportation and water, sanitation, and other urban infrastructure sectors rated as "A" or "B" is more or less the same; while those for the latter sector are vast, and distribution for "C" or "D" ratings also stand out. Throughout all sectors, for projects with an overall rating of "C" or "D", sub-rating by evaluation criteria shows relatively more distribution in "②" for efficiency, effectiveness and sustainability but there are also many projects rated "①" for sustainability compared to the other evaluation criteria.

<Figure 9> Distribution of the Number of External Evaluation by Project Commencement Year (by sector)*9
<Figure 10> Distribution of Overall Rating (by Sector)



*6: Since the former Japan Bank for International Cooperation (JBIC) was established in October 1999 and the new JICA (by merger of former JBIC and former JICA) was established in October 2008, the periods are divided by the year of these establishments.
 *7: Projects in China accounts for a large proportion of assistance in East Asia but new commitments for Grant Aid and ODA loans to the country ceased in 2006 and 2007, respectively.
 *8: Each region includes the following countries: Southeast Asia: Indonesia, Cambodia, Thailand, the Philippines, Vietnam, Malaysia, Myanmar, Laos and East Timor; Pacific: Kiribati, Samoa, Solomon, Tonga, Vanuatu, Papua New Guinea, Palau, Fiji and Micronesia; East Asia: Republic of Korea, China and Mongolia; Central Asia and the Caucasus: Azerbaijan, Armenia, Uzbekistan, Kazakhstan, Kyrgyz, Georgia, Tajikistan and Turkmenistan; South Asia: Afghanistan, India, Sri Lanka, Nepal, Pakistan, Bangladesh, Bhutan and Maldives; Latin America and the Caribbean: Argentina, Antigua and Barbuda, Ecuador, El Salvador, Guyana, Guatemala, Grenada, Costa Rica, Colombia, Jamaica, Saint Vincent and the Grenadines, Dominican Republic, Nicaragua, Paraguay, Brazil, Peru, Bolivia, Honduras and Mexico; Africa: Angola, Uganda, Ethiopia, Eritrea, Ghana, Gabon, Cameroon, Guinea, Kenya, Côte d'Ivoire, Zambia, Sierra Leone, Zimbabwe, Swaziland, Seychelles, Senegal, Tanzania, Nigeria, Namibia, Niger, Burkina Faso, Burundi, Benin, Botswana, Madagascar, Malawi, Mali, Mauritius, Mauritania, Mozambique, Lesotho and Republic of South Africa; Middle East: Algeria, Iran, Egypt, Syria, Tunisia, Morocco, Jordan and Lebanon; and Europe: Albania, Ukraine, Slovakia, Serbia, Turkey, Bulgaria, Bosnia and Herzegovina, Macedonia and Romania.
 *9. Categorization of sectors is based on those used in our statistical analysis.