TERMINAL EVALUATION REPORT

ON

INSTITUTIONAL SUPPORT TO IPEA IN THE AREA OF MACROECONOMICS

March, 2005

JICA Brazil Office

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Contents of Evaluation Report

Summary

<table>
<tr><td colspan="3">I. Outline of the Project</td></tr>
<tr><td colspan="2">Country : Republic Federative of Brazil</td><td>Project title : Institutional Support to IPEA in the area of Macroeconomics</td></tr>
<tr><td colspan="2">Issue/Sector : Financial System</td><td>Cooperation scheme : Economic Policy</td></tr>
<tr><td colspan="2">Division in charge : Regional Dept. III South America Division</td><td>Total cost :
Cost per participant:
Share of Japan's Contribution:</td></tr>
<tr><td rowspan="2">Period of Cooperation</td><td rowspan="2">(R/D): from April 1, 1999 to March 31, 2002
(Extension): No
(F/U) : No</td><td>Partner Country's Implementing Organization : Institute of Applied Economics Study - IPEA</td></tr>
<tr><td>Supporting Organization in Japan :
Japan International Cooperation Agency - JICA</td></tr>
<tr><td>Related Cooperation :</td><td colspan="2">none</td></tr>
</table>

1 Background of the Project

The Brazilian economy had suffered from chronicle and hyperinflation as well as from slow and unstable growth for more than two decades until the implementation of Real Plan of 1994. Those macroeconomic instability features made it impossible to formulate consistent economic modeling mainly due to lack of consistent data availability. In the meantime, the capacity and know-how of constructing economic models and their application to economic policy evaluation and analyses had deteriorated.

On the basis of macroeconomic stability after Real Plan, Brazil made a footing to revive a sustainable economic development and to prevent potential macroeconomic turmoil with consolidated macroeconomic policy.

The IPEA, the leading institution of economic policy analysis and evaluation under the Ministry of Planification, is expected to play a key role in basic policy analysis and recommendations to formulate Brazilian economic policy and urged to restructure its institution to meet newly recurrent needs from the Government of Brazil. The institutional reinforcement of IPEA requires capacity upgrading of its personnel by means of, among others activities, enhancing interchange of views, opinions and know-how of the personnel between Brazil and Japan.

2 Project Overview

(1) Overall Goal

To reinforce capability of economic policy analysis and monitoring on the sustainable development of Brazil through strengthening the institutional capacity of IPEA.

(2) Project Purpose

To promote exchange of views and opinions in the area of economic policy analysis through macroeconomic modeling exercises and to establish a basis for an active interchange of technical personnel between Brazil and Japan.

(3) Outputs

Revision and updating existing models and databases

Construction of new models

Simulation Exercises

(4) Inputs

Japanese side :

Long-term Expert	**1**	**Equipment**	**US$ 30 000**
Short-term Expert	**5**	**Local cost**	
Trainees received	**5**	**Others**	**US$ 420 000**

Brazilian Side :

Counterpart	**US$ 534 000**	**Equipment**	**US$ 24 000**
Land and Facilities	**US$ 24 000**	**Local Cost**	**US$ 276 000**
Others	**US$ 210 000**		

II. Evaluation Team		
Members of Evaluation Team	Francisco E. Pires de Souza Nelson H. Barbosa Filho	
Period of Evaluation	**20/01/2004 through 20/02/2004**	**Type of Evaluation : Terminal Evaluation**

III. Results of Evaluation

The development of a good, encompassing, and flexible macroeconomic model is essential for economic policy. Its construction in Brazil became possible when the country ended its period of high inflation. JICA's support to capacity building at IPEA is therefore a very important project for the design and execution of economic and development policy in Brazil.

The changes made during the execution of the project were mainly the result of the opportunities to develop new studies based on the expertise of the Japanese participants. In this sense, these changes were necessary adaptations to use the inputs to the project in most efficient way.

The project did contribute, although less than it was expected, to the development of macroeconomic models at IPEA. In contrast, it did contribute a lot to the development of applied models in another two areas: the social security system of Brazil and the consumption behavior in Brazilian households. The two areas are extremely important for the long-run economic planning and policy of the Brazilian Government.

As many other academic initiatives, the project of cooperation between JICA and IPEA was basically an exchange of research experience and seminars, with little impact on the structure of the large macroeconomic models of IPEA. The main result was the exchange of ideas between Brazilian and Japanese researchers and, even though the models constructed during this exchange did not represent a major improvement in relation to what already existed at IPEA before the project, new lines of investigation were opened for future research.

Regarding the annual model, the reduced and simpler version developed by the Japanese experts has a high pedagogic value, in the sense that it is straightforward illustration of how macro models work for those not familiar with the topic. The forecasts and explaining power of such a reduced version are obviously inferior to those of IPEA's large-size model, but its structure is much easier to understand and modify.

Regarding the quarterly model, there was little progress in relation to the model already developed by IPEA. The main contribution was the incorporation of new tests about the fit and accuracy of the model (the so known "final test") to IPEA's research methodology.

Regarding the monthly model, so far the results have not been useful for IPEA basically because of the short size of the sample used. Since the passage of time will naturally eliminate this restriction, there is no obstacle for IPEA's staff to improve the monthly model in the near future.

The main result of the project was the study about the consumption expenditures of Brazilian households. This was the 1st study of its kind based on the data collected by the POF, and its results were carefully and very well written to facilitate its understanding and application by

other researchers.

1 Summary of Evaluation Results

(1) Relevance

Evaluation Result: High

Basis:

・IPEA's models continue to be used in the macroeconomic policy and management by the Brazilian Federal Government.

・IPEA's macro models are a benchmark for other models used within the Brazilian Government and in the Brazilian Academia and market institutions.

(2) Effectiveness

Evaluation Result: High

Basis:

・The annual, quarterly and monthly models were developed as planned.

・The database has been regularly updated as planned, but this would have been done independently of the cooperation with JICA.

・Two new models were developed together with the Japanese experts: a model of consumption and a model of social security in Brazil.

・The results of the project were disseminated through seminars at IPEA and a book (published in 2003).

(3) Efficiency

Evaluation Result: Medium

Basis:

・ The research resources of IPEA were used efficiently.

・The bureaucratic requirements delayed the investments in IPEA's research infrastructure.

・The interchange between the Japanese and Brazilian researchers was very useful, but it was restricted to the periods when the former visited Brazil.

・The visits of Brazilian researchers to Japan were extremely useful.

・The long-term Japanese researcher did not work as planned initially, that is, he concentrated his work more on bureaucratic than on research matters.

（4） Impact

Evaluation Result: Medium

Basis:

・The macro models developed together with the Japanese experts have not yet been incorporated into IPEA's research agenda, but nothing prevents this to happen in the near future.

・The consumption model developed with the Japanese expert has been incorporated into IPEA's studies of the impacts of taxation on households' welfare.

（5） Sustainability

Evaluation Result: High

Basis:

・IPEA's staff is capable of maintaining and developing the results of the cooperation with JICA (the "mini" annual model and the quarterly and monthly model).

・IPEA's staff continue to work on the consumption model developed together with the Japanese expert (Asano) and will update it as soon as new data becomes available.

・Even though some of Brazilian researchers left IPEA, but remained working in Brazilian institutions, the remaining staff is able to maintain and develop the results of the project.

2. Factors promoting sustainability and impact

（1） Factors concerning to Planning

The planning of the cooperation was well conceived and benefited from the fact that it envolved the development of a project that was already being done with certain success, with the purpose of enlarging its scope and developing the skills of IPEA's staff – particularly the new and younger researchers.

（2） Factors concerning to the Implementation Process

The visits of IPEA's participants to Japan were very well arranged and the knowledge adquired in the contact with Japanese intitutions were very fruitful for the development of the project. However, the main factor responsible for the success of those parts of the project that had most impact was the convergence of interests between some researchers of IPEA and Japanese experts, in some subjects or envolving the use of certain techniques. This aspect should be more a matter of planning in other projects of this kind.

3. Factors inhibiting sustainability and impact

(1) Factors concerning to Planning

The planing of the cooperation was well conceived except for the fact that it did not take into account the difficulties that it did not provide a mechanism to proceed with the joint work after the visist of the Japanese experts to Brazil. The impact could eventually be greater if the joint work had continued for all the period of the project and for all the experts.

(2) Factors concerning to the Implementation Process

The fact that the long term japanese expert did not get envolved with the subject of the project, limiting his tasks to the bureaucratic arrangements, was a limiting factor regarding the following up of the work after the short visits of Japanese experts. And this was probably one of the causes of the fact that some of the models developed were not incorporated into IPEA's regular work.

4. Conclusion

Overall, the project was successful. Even though the inputs could have been used more efficiently, the outputs were obtained as planned. Moreover, the adjustments made during the project were very successful, especially the decision to include a study of the consumption function of Brazilian households in the research topics. The resulting models have been incorporated to IPEA's expertise, which in its turn has become increasingly important for macroeconomic management and policy analysis by the Brazilian government.

5. Recommendations

For similar projects in the future, it would be very useful to: clearly specify the form, timing and evaluation of the research output; to balance the demands of the recipient institution with the interest and expertise of Japanese researchers indicated by JICA; to allow or stimulate Japanese researchers to work on the project while in Japan; to carefully define and monitor the work of the long-term Japanese researcher in the recipient country; to formally define the form, size and timing of investments in research infrastructure before the beginning of the project.

6. Lessons Learned

The main lesson learned is that, in academic projects, success depends heavily on three factors, namely: (1) the common interest of Japanese and host researchers in developing a new research

(for instance, the consumption model for Brazil); (2) the degree to which the techniques and methodologies brought by the Japanese researchers are novel to the host researchers (in the case of Macro models, IPEA's staff had already a sophisticated model, so the work of the Japanese experts was concentrated more in the adaptation of the existing models to replication and alternative periodicities); and (3) the intellectual affinity of Japanese and host researchers (in the consumption study of Brazil both parts were interested in the same thing, in the macro area the interest were not always coincident). When these three factors above are present, the project tends to be highly successful.

Project Design Matrix for Evaluation:

Narrative Summary	Quantifiable indexes	Means of verification	Main hipotheses
Goal: support and improve the analysis and monitoring of economic policy in Brazil	Non applicable	Non applicable	The goals of the Brazilian Government remain the same
Purpose: institutional support and capacity-building of IPEA's staff in Macroeconomics	Number and structure of IPEA's models before and after the project	Analysis of the models Analysis of the publications Interviews	The capacity-building of IPEA's staff is due only to the cooperation between JICA and IPEA.
Output: Revision and updating existing models and databases Construtions of new models Simulation Exercises	Number and structure of IPEA's models before and after the project Updating of databases Tests and simulations exercises done with the models	Analysis of the models Analysis of the publications Analysis of the databases Interviews	The capacity-building of IPEA's staff is due only to the cooperation between JICA and IPEA The updating of models and databases is due only to the cooperation between JICA and IPEA
Activities: Econometric analysis Publications (papers and books) Exchange of research staff Organization of seminars and conferences Investments in the research infrastructure of IPEA	Resources from Japan: 450* Project coordinator (240) Visits of Japanese experts to Brazil (60) Training of IPEA's staff in Japan (120) Investments in IPEA's research infrastructure (30)	Resources from Brasil: 534* Seminars and conferences (150) Domestic travels of Japanese experts while in Brazil (60) IPEA's support in services and goods (324)**	IPEA's staff that participated in the project remains at IPEA after the project is completed. No bureaucratic barriers to the exchange of research staff and to the investments in IPEA's research infrastructure.

* Value in thousands of US dollars and based on the form to request technical cooperation, submitted by IPEA, to the Brazilian Ministry of Foreign Relations. ** One senior economist (120), two junior economists (144), one secretary (24), one research trainee (12), and two offices equipped with computers and telephones (24).

Summary of the results according to the five evaluation criteria:

	Efficiency	Effectiveness	Impact	Relevance	Sustainability
Project goal			The macro models developed by the Japanese experts were not incorporated to the routine research of IPEA. The statistical tests suggested by the Japanese experts were incorporated by IPEA's staff in their routine research tasks The consumption model was the 1st of its kind in Brazil and its is currently being used by IPEA to analyze the impact of indirect taxes on the welfare of Brazilian households.	IPEA's macro models are widely used in the planning and execution of economic policy in Brazil IPEA's models are the benchmark for other branches of the Brazilian Government (specially the Central Bank), for market and academic institutions. IPEA's forecasts have a great impact and repercussion on the Brazilian media and market.	IPEA is capable of maintaining and improving the models that resulted from the project. The consumption model will be updated as soon as the data from the new Survey of Households' Budget (POF), of 2002-03, is published. Some of the Brazilian participants in the project left IPEA, but remained in Brazil, working in research and teaching activities.
Project objective		The annual model was revised and simplified; an alternative quarterly model was created; and the 1st monthly model was created The project made the 1st study of consumption behavior based on the data from the POF Many tests and simulations exercises were done with all macro models The project resulted in seminars and a book, containing the main results of each model			
Output	IPEA provided the necessary infrastructure to the project and received equipments (computers) from JICA. The exchange program was partially effective. The long-term Japanese expert did not worked as initially expected Bureaucratic barriers delayed and made difficult the investment in IPEA's research infrastructure				
Inputs					

Executive Report of Project Evaluation to the Japanese International Cooperation Agency

Introduction

This document presents a summary of the evaluation of the institutional support of JICA to macroeconomic modeling at IPEA. The project was implemented in 1999-2001 and its main goal was to increase the capacity of IPEA's staff, mainly junior researchers, in macroeconomic modeling. The mean to achieve this goal was an exchange program, where Japanese researchers visited Brazil and IPEA's staff visited Japan, as well as investments in IPEA's research infrastructure funded by JICA. The main objective of the interchange was to revise and update IPEA's existing macro models.

Given the academic nature of the project, the evaluation was concentrated on interviews with IPEA's staff and an analysis of the related publications (books, working papers and documents). The evaluation strategy was to compare the state of the art of macro modeling at IPEA before and after its cooperation with JICA.

Evaluation Summary

Seven points emerged in the course of evaluation:

1) The long-term Japanese expert did not work as initially planned. He was more concentrated in the bureaucratic tasks involved in the visits of Japanese experts to Brazil than in coordinating the research of both the parties of the project.
2) The work of the short-term Japanese experts was very helpful and illuminating for IPEA's staff. However, since the Japanese experts worked on the project only during their short visits to Brazil, the research progress was slow.
3) The work of the Japanese experts was concentrated in developing simpler models and forecasting test where IPEA's staff already had well-developed models (the annual and quarterly macro model). In the areas where IPEA had nothing, the Japanese experts created new models (the "mini" annual model, the monthly model and the consumption model).
4) The visits of IPEA's staff to Japan were very useful, especially the ones associated with consumption model.
5) The results of the research were well disseminated through seminars at IPEA, working papers and a book. The latter was IPEA's most demanded publication in the 2003 meeting of the Brazilian Economic Association (ANPEC).
6) Some bureaucratic issues delayed and restricted the investments in IPEA's research infrastructure associated with the project.
7) Even though IPEA's staff is capable of maintaining and developing the results of the project further, so far only the consumption investigation has been formally incorporated into IPEA's research agenda. The other models may be incorporated in the future to facilitated and clarify the structure of IPEA's models (the mini annual model and the quarterly model) or when more observations become available (the monthly model).

Overall Evaluation

Evaluation Criterion	Evaluation Result	Basis
Efficiency	Medium	The research resources of IPEA were used efficiently. The bureaucratic requirements delayed the investments in IPEA's research infrastructure. The interchange between the Japanese and Brazilian researchers was very useful, but it was restricted to the periods when the former visited Brazil. The visits of Brazilian researchers to Japan were extremely useful. The long-term Japanese researcher did not work as planned initially, that is, he concentrated his work more on bureaucratic than on research matters.
Effectiveness	High	The annual, quarterly and monthly models were developed as planned. The database has been regularly updated as planned, but this would have been done independently of the cooperation with JICA. Two new models were developed together with the Japanese experts: a model of consumption and a model of social security in Brazil. The results of the project were disseminated through seminars at IPEA and a book (published in 2003).
Impact	*Medium*	*The macro models developed together with the Japanese experts have not yet been incorporated into IPEA's research agenda, but nothing prevents this to happen in the near future.* The consumption model developed with the Japanese expert has been incorporated into IPEA's studies of the impacts of taxation on households' welfare.
Relevance	High	IPEA's models continue to be used in the macroeconomic policy and management by the Brazilian Federal Government. IPEA's macro models are a benchmark for other models used within the Brazilian Government and in the Brazilian Academia and market institutions.
Sustainability	High	IPEA's staff is capable of maintaining and developing the results of the cooperation with JICA (the "mini" annual model and the quarterly and monthly model). IPEA's staff continue to work on the consumption model developed together with the Japanese expert (Asano) and will update it as soon as new data becomes available. Even though some of Brazilian researchers left IPEA, but remained working in Brazilian institutions, the remaining staff is able to maintain and develop the results of the project.

Conclusion, Recommendations and Lessons Learned

Overall the project was successful. Even though the inputs could have been used more efficiently, the outputs were obtained as planned. Moreover, the adjustments made during the project were very successful, especially the decision to include a study of the consumption function of Brazilian households in the research topics. The resulting models have been incorporated to IPEA's expertise, which in its turn has become increasingly important for macroeconomic management and policy analysis by the Brazilian government.

For similar projects in the future, it would be very useful to: clearly specify the form, timing and evaluation of the research output; to balance the demands of the recipient institution with the interest and expertise of Japanese researchers indicated by JICA; to allow or stimulate Japanese researchers to work on the project while in Japan; to carefully define and monitor the work of the long-term Japanese researcher in the recipient country; to formally define the form, size and timing of investments in research infrastructure before the beginning of the project.

The main lesson learned is that, in academic projects, success depends heavily on three factors, namely: (1) the common interest of Japanese and host researchers in developing a new research (for instance, the consumption model for Brazil); (2) the degree to which the techniques and methodologies brought by the Japanese researchers are novel to the host researchers (in the case of Macro models, IPEA's staff had already a sophisticated model, so the work of the Japanese experts was concentrated more in the adaptation of the existing models to replication and alternative periodicities); and (3) the intellectual affinity of Japanese and host researchers (in the consumption study of Brazil both parts were interested in the same thing, in the macro area the interest were not always coincident). When these three factors above are present, the project tends to be highly successful.

PROJECT EVALUATION REPORT

Project:	Institutional Support to IPEA in the Area of Macroeconomics
Subject:	Macroeconomic Modeling
Evaluation period:	January 20 through February 20, 2004
Evaluating team:	Francisco E. Pires de Souza (fepsouza@ie.ufrj.br)
	Nelson H. Barbosa Filho (nhbarbosa@ie.ufrj.br)

Table of Contents

1 - Framework of Evaluation

This report presents the evaluation results of the project of cooperation between the Japanese International Cooperation Agency (JICA) and the *Instituto de Pesquisa Econômica Aplicada* (IPEA) of the Brazilian Government, to strengthen IPEA's macroeconomic research. This project aimed to promote a discussion of different points of view and opinions about economic policy analysis, through a series of exercises of macroeconomic modeling, as well as to establish the basis for a staff exchange-program between Brazil and Japan.

The project evaluation followed the methodology of "Project Cycle Management", recommended by JICA, and was carried out from January 20 through February 20, 2004. Three information sources were used as basis of analysis:

(a) The project documents.

(b) Interviews with the IPEA's staff.

(c) The publications related to the project.

The information collected was organized in a Project Design Matrix and the results evaluated according to the five criteria recommended by the evaluation methodology, that is: efficiency, effectiveness, impact, relevance and sustainability.

This report is organized in four sections in addition to this introduction. Section two presents a general view of the project origin, development and results. The section three presents the preparation of the Project Design Matrix and section four analyzes the results according to the criteria mentioned above. Section five presents the conclusions, recommendations and main lessons learned. The appendix presents the Project Design Matrix; the list of the IPEA's staff interviewed; the questions made to them; and the documents and publications analyzed by the evaluation team.

2 – Project Overview

The main goal of the cooperation between JICA and IPEA was an institutional support to capacity building at IPEA to analyze and monitor the economic policy and development for the Brazilian Government. More specifically, the project aimed to promote an exchange of views and information about the analysis of economic policy, especially regarding modern techniques of macroeconomic modeling. Since IPEA already had a macroeconomic model to make forecasts and simulations, the work of the Japanese and Brazilian researchers was initially focused in expanding and improving the existing model.

Some changes were made in the initial plan after the project started. As we will comment below, some difficulties came up in executing the planned tasks and, on the other hand, some opportunities of research and cooperation came up in areas not initially included in the work plan of the project.

Regarding the macroeconomic models of IPEA, at the beginning of the project it was decided that the Japanese experts would work in alternative and parallel models to those

already under use and development at IPEA. Because of this strategy, the success of the project depended on the coincidence between the research interests of the Japanese experts and the will of IPEA's staff in diversifying their work toward those interests. The final result was that the three alternative macroeconomic models developed by the Japanese experts (the monthly model, the quarterly model and the reduced annual model or mini MOPSE) ended up not being incorporated, so far, to the routine analysis and research tasks of IPEA's division of macroeconomic studies. This division continues to use the quarterly and annual models developed by their own Brazilian staff, but there is no obstacle for the models constructed by the Japanese staff to be used in the near future, provided that some further work is done in developing and updating such models.

On the other hand, the joint work of Brazilian and Japanese experts on stochastic simulations and multipliers, which was aimed to test the forecasts of the models, ended up being an important addition to the work of IPEA in macroeconomic modeling. In this case, the instrument developed by the project with JICA - the "final test" of the models – was an important complement to the previous work done by IPEA's staff and it was easily incorporated to their routine tasks.

The most interesting part of the project was the joint research of Brazilian and Japanese experts in developing and estimating a model of consumption behavior for Brazil based on the data of the Household Budget Survey (*Pesquisa de Orçamento Familiar* or POF for short) of IBGE (the Brazilian Institute of Geography and Statistics). In order to understand the successes and failures of the institutional support of JICA to IPEA, as well as to make recommendations for new projects of the same kind, it is worthy to pinpoint some characteristics of the research on consumption behavior that made this the most successful part of the JICA-IPEA cooperation.

Three characteristics were present in the joint research on consumption and they seem to be the necessary conditions for success, namely:

a) The existence of new project or research topic to be jointly developed by the Japanese and "local" researchers.

b) The use of techniques of investigation that are either new or not well-known by the local researchers.

c) The intellectual affinity and similar interests between the Japanese and local researchers.

In fact, it is possible that just one or two of the above characteristics guarantees the success of the project. When the three are present, the results tend to be highly positive.

Regarding the first characteristic, up until the JICA-IPEA cooperation, the Brazilian literature on consumption behavior lacked a comprehensive study of the demand for a wide bundle of consumption goods. Almost all of the previous works were concentrated just on the demand for food. Then, the interest and previous experience of the Japanese expert on the topic, the interest of one of IPEA's staff in pursuing the same line of research, and the publication, at that time, of the POF data of 1996 by IBGE opened up the opportunity for a novel research on the consumption behavior of Brazilian households.

Regarding the second characteristic, the experience of the Japanese expert in applied microeconometrics was extremely important for the success of the investigation, since most of techniques used were not known by IPEA's staff at that time. The visit of the IPEA researcher to Japan was also very useful because it allowed him to see and learn the techniques used in Japan to model and analyze the data of households' budget surveys. The same techniques were applied to the Brazilian data.

Finally, the intellectual affinity and common interest resulted in a seminal joint work experience. Indeed, not only the original work resulted in many papers, but also new projects of joint work came up from this experience. In sum, this part of the project achieved a good performance in the five evaluation criteria: efficiency, effectiveness, impact, relevance, and sustainability.

Initially, the project would take three years (from April, 1999 through March, 2002 as stated in the "Record of Discussions"). After the project started, its duration was reduced to two years (see the request form for Cooperation in Technical Activities and the "Work Plan for JICA Experts").

3 – Preparation of the Project Design Matrix for Evaluation

Because of the academic nature of the cooperation between JICA and IPEA, the evaluation was planned to compare the progress of the IPEA's macroeconomic research before and after the project. To do so, the evaluation team focused its analysis on the publications and documents related to the project, as well as on the interviews of IPEA's staff.

The main problems in evaluating the project were the following:

a) Difficulty to measure the project goal quantitatively: the support and training of IPEA's staff in macroeconomic modeling involves both tangible aspects (for instance, investments in research infra-strucuture) and intangible aspects (for instance, the increase of knowledge of IPEA's staff). Since the latter is difficult to measure objectively, the evaluation was based on a subjective analysis of the project results (research papers and other publications) and interviews of IPEA's staff.

b) Difficulty to separate the results of the project from the results of other activities usually done by IPEA: independently of its cooperation with JICA, IPEA continued its applied economic research in macroeconomics. Many of the research results obtained during the cooperation with JICA (1999-2001) were, therefore, due to the usual research activities performed by IPEA. To separate the JICA-project results from IPEA's ongoing activities, the evaluation team concentrated its analysis on the book containing the main project results (Fukuchi and Cavalcanti 2003).

c) There was little detail about the resources effectively used in the project: the evaluation team had access only to the initial research and cooperation proposal and, therefore, could not evaluate in great detail how the resources were effectively used. Through the interviews with IPEA's staff, it was possible to obtain only an estimate of the activities and investments in research

infrastructure made with the project resources. The estimate of the inputs to the project was based on the initial proposal of cooperation between JICA and IPEA.

d) Absence of quantitative objectives or targets regarding the publication of the project results: the initial research and cooperation proposal did not specify the form, deadlines and number of research papers that the project should produce.

4 – Evaluation Results

This section presents the comments on the project results according to the five evaluation criteria recommended by JICA.

Efficiency

Regarding efficiency, it is important to investigate how the inputs were converted into outputs, if the quality and quantity of the inputs were adequate, and if the methodology and timing of resource utilization was appropriate.

The main inputs used in the project were:

a) The work of IPEA's staff and Japanese experts indicated by JICA.

b) The research infrastructure of IPEA.

c) The research equipment and material provided by the Japanese Government through JICA.

d) The software, books and documents bought with the financial resources provided by JICA.

In relation to the above, the interviews with IPEA's staff revealed the following:

a) Regardng the work of Japanese and Brazilian researchs, the project was partially effecient. On the one hand, the joint work of Japanese and Brazilian researchers and the visits of the latter to Japan achieved the objective of project stated in the *Master Plan* of December 1998, that is: "*to promote exchange of views and opinions in the area of economic policy analysis through macroeconomic modeling exercises.*" On the other hand, some problems impeded the full and efficient use of the inputs to the project, as detailed below.

b) The research infrastructure provided by IPEA (office and equipments) was adequate to the execution of the project.

c) The purchase of computer software and technical books and publications to be used in the project did not work as planned, as detailed below.

The main problem was the discontinuity in the joint work of the Japanese and Brazilian researchers. According to the interviews, this was caused by the fact that the "long-term" Japanese expert limited himself to execute bureaucratic tasks, related to organizing the visits of the "short-term" Japanese experts, having no great participation in the technical development of the project, that is, macroeconomic modeling.

In the original work plan, the long-term Japanese expert was in charge to "coordinate the activities of the short-term Japanese experts with their corresponding Brazilian researchers", that is, he was supposed to promote the integration of the work of both sides instead of just organizing the visits of one side to the other. As stated in the project: "(...) the long term expert will prepare a basis for modeling works, make up for the relatively uncovered area and act as an interface with the Brazilian side". This was not done as expected.

On the other hand, the short-term Japanese experts made very short visits to IPEA and, in many cases, it seemed that the work they started in Brazil did not continue when they returned to Japan. The research cooperation functioned better in the cases where the short-term Japanese experts came many times to Brazil. Among the most successful work in the macroeconomic modeling, the interviews referred to the coordinator in the Japanese side, T. Fukuchi, and M. Obayashi. Anyway, it seems that the project lacked a long-term coordinator that effectively participated in its technical part and kept track of all the work being done.

On the Brazilian side, the main problem was that some of the young research staff left IPEA during the project. One researcher left IPEA to pursue his Ph.D. studies abroad, while two other researchers left IPEA to work in other Brazilian institutions. The result was that IPEA lost part of the capacity building promoted by the project.

Moving to the purchase of computer software and other research materials, there was a partial success. Because of bureaucratic obstacles to purchase computer software and publications with the resources of the project, as well as because of an imperfect communication between the Brazilian and Japanese sides, only part of the research inputs demanded by IPEA were effectively acquired.

There were many restrictions to the purchase of the research inputs listed as necessary by IPEA. For instance, it was not possible to buy or subscribe to scientific journals with the resources of the project. Moreover, an econometric software that was available in Brazil (E-Views 4.0) had to be bought in Japan and, when it finally arrived in Brazil, the research team realized that what was bought was a one-user license. In this case there was failure of communication between the Brazilian and Japanese sides. From the electronic mails exchanged between the Brazilian researcher and the long-term Japanese expert, it was clear that it was necessary to buy a license for more than one user.

Because of the above failures, the quantity and timing of use of inputs was not efficient. Given what was initially planned, the reduced inputs effectively made available for IPEA cannot be interpreted as a high productivity of the project.

Finally, it is impossible to calculate or estimate input-output verifiable indicators because it is impossible to measure, in monetary terms, the main product of the project – the institutional improvement of IPEA, the capacity building of IPEA's staff in the area of macroeconomic modeling and its capacity in offering useful tools for the analysis of the Brazilian economic policy. In the next criterion (effectiveness), we do a qualitative analysis – which is more adequate in the case of this project – of the outputs of the project. Such a qualitative assessment indicates that the inputs were not used in the most efficient way possible.

Effectiveness

If we define effectiveness as the degree to which the objective of the projects were achieved, independently on whether the inputs were efficiently used, the institutional support of JICA to IPEA was relatively successful. The exchange program allowed IPEA's staff to learn from the institutions and economic policy of Japan and, especially in the case of the study on consumption expenditures of households and the works on stochastic dynamic simulations, to learn new techniques of macroeconomic modeling and investigation.

The visits to Japanese institutions (like the Central Bank of Japan, Ministries of the Japanese Government and centers of statistical research) allowed the Brazilian researchers to learn from how economic policy is done in Japan, as well as from the studies and models used to guide such policy. According to the interviews, these visits were of great utility for the Brazilian researchers.

In order to analyze the output of the project in relation to its stated objectives, we have to separate what output was really due to the cooperation between JICA and IPEA from the output due to other factors and routine tasks already done by IPEA without JICA. In short, the main results in terms of macroeconomic modeling were the following:

a) The quarterly and annual models of IPEA, which are the ones effectively used by IPEA in its short-run forecasts and analysis of economic policy, were extended and now include many more variables and equations in comparison to what was available before the JICA-IPEA cooperation. However, the contribution of JICA to such a development was small, that is, it was restricted to the development of new accuracy test (the final test) to evaluate the forecasts of IPEA's quarterly and annual models.

b) In contrast, the reduced and more "use-friendly" version of IPEA's annual model (the so known mini MOPSE) was an important contribution of the Japanese experts (M. Obayashi), in the sense that it made a simpler version of IPEA's model easily accessible to all research staff at IPEA and other branches of the Brazilian government and academia. Nevertheless, some technical problems with the mini MOPSE have yet to be solved and, therefore, this model has not been used by IPEA' division of macroeconomic studies.

c) The alternative and simpler version of IPEA's quarterly model was also developed by the Japanese expert (S. Tokunaga), and its results were published in the book containing the main output of project. Similar to what happened with the mini MOPSE model, the alternative quarterly model has not been used by IPEA' division of macroeconomic studies because it is less sophisticated than its original quarterly model.

d) The monthly model (developed by T. Fukuchi) was a natural complement to IPEA's quarterly and annual model, but is has also not been used by IPEA because its results were not considered to be statistically good. However, since the major deficiency of this model was the short size of the sample used to estimate it during the project, the model may be incorporated to IPEA's routine investigation in the near future, when the monthly series would be long enough to allow for meaningful statistical results.

Two products, not initially planned, were successfully added to the project. The first one was a quantitative analysis of the social security system in Brazil, which is important for macroeconomic policy because of its implications for the evolution of the Government's budget deficits and debt. The second product was an econometric analysis of the consumption expenditures of Brazilian households, which we already commented in the introduction.

It should be noted the innovative nature of the research done on consumption. Through its analysis of the micro data of the POF, this part of the project allowed a special aggregation of the information into regional price and quantity indexes, which in its turn allowed a better knowledge of the regional variations in the consumption behavior of Brazilian households. Moreover, the estimated price and income elasticity of consumption also allowed many simulation exercises, which verified the impact of indirect taxes, subsidies, and income policies on the welfare of Brazilian households.

Relevance

The annual macroeconomic model of IPEA (MOPSE-B) was the first of its kind and it was developed by IPEA for the Brazilian Government to be used in the analysis of the macroeconomic policy of the country. Initially, the MOPSE-B was built to attend the analytical demands of the *Secretaria de Política Econômica* (SPE - Secretary of Economic Policy), a division of the Brazilian Ministry of Finance, to which IPEA was subordinated in 1998-2000. IPEA later moved to the Ministry of Planning, Budget and Management.

The support and capacity-building of IPEA's staff in macroeconomic modeling is extremely important for the actions of the Brazilian Federal Government, especially in recent years, when the Brazilian monetary and fiscal policies have become increasingly oriented by quantitative targets (inflation targets on the monetary side and primary-surplus targets on the fiscal side).

Impact

The models of IPEA were and continue to be used by SPE in the definition and analysis of the macroeconomic policy of Brazil. In addition to this, the models have also been used in the macroeconomic forecasts of the Ministry of Planning, during the elaboration of its Multi-Year Investment Plans for 2000-03 and 2004-07.

The macroeconomic model of IPEA has also been used by the Central Bank of Brazil in the development of its own macro models to track and target inflation, which use basically the same qualitative structure of IPEA's model. In fact, IPEA's staff presented their work in a series of seminars to the researchers of the Central Bank of Brazil in 1999-2000.

The models of IPEA also have an important impact in the application of macroeconomic models by the Brazilian academia. The main channels of transmission from IPEA to the academia are the following:

a) The IPEA seminar series, which are open to the public.

b) The Economic Bulletin (*Boletin de Conjuntura*) published by IPEA based on the results of its macroeconomic models.

c) The Working Paper Series of IPEA.

d) The book containing the joint studies of IPEA's staff and the Japanese experts (which was IPEA's the most demanded publication at the last meeting of the Brazilian Economic Society, ANPEC, in December 2003).

e) The utilization of IPEA's macroeconomic model as a benchmark in courses of macroeconometrics at the top economic departments of Brazil.

In the private sector, the main impact of IPEA's model occurs through its forecast and studies published in IPEA's economic bulletin (*Boletim de Conjuntura*). The forecasts have a wide repercussion in the media and constitute a benchmark for the forecasts of financial firms (collected by the Focus Bulletin of Market Expectations of the Central Bank of Brazil) and of the Central Bank of Brazil (included in its quarterly Inflation Targeting Report).

In addition to the macroeconomic model, the cooperation with JICA allowed IPEA to develop the first study about consumption in Brazil based on the households' budget survey (*Pesquisa de Orçamento Familiar*) of IBGE. This study provided detailed information about the price and income elasticity of consumption expenditures by income class and, in this way, it was extremely useful for the analysis of the impact of indirect taxes on the welfare of Brazilian households.

Sustainability:

IPEA's research staff is capable of maintaining and developing further the macroeconomic models constructed during its cooperation with the JICA experts. So far some of the results have not been developed beyond what was done together with the Japanese researchers because they do not necessarily coincide with the current research priorities of IPEA (not because a lack of analytical capacity by IPEA). In the long run, IPEA has enough analytical capacity and intention to continue the investigation started with the Japanese experts. For instance, the research on consumption continues to be developed and will be updated as soon as the new data on the Brazilian households' budget (collected in 2002-03) is published by IBGE.

As it happens with various branches of the Brazilian Government, IPEA tends to loose some of its younger staff after some years. Usually, IPEA's staff is composed mostly of young researchers that, after some years of work and training, receive better job offers from the market, or even from other branches of the Brazilian Government (the Central Bank, the Ministry of Finance, etc). In most of the cases the former IPEA researcher remains in Brazil.

5 – Conclusion

The development of a good, encompassing, and flexible macroeconomic model is essential for economic policy. Its construction in Brazil became possible when the country ended its period of high inflation. JICA's support to capacity building at IPEA is therefore a very important project for the design and execution of economic and development policy in Brazil.

The changes made during the execution of the project were mainly the result of the opportunities to develop new studies based on the expertise of the Japanese participants.

In this sense, these changes were necessary adaptations to use the inputs to the project in most efficient way.

The project did contribute, although less than it was expected, to the development of macroeconomic models at IPEA. In contrast, it did contribute a lot to the development of applied models in another two areas: the social security system of Brazil and the consumption behavior in Brazilian households. The two areas are extremely important for the long-run economic planning and policy of the Brazilian Government.

As many other academic initiatives, the project of cooperation between JICA and IPEA was basically an exchange of research experience and seminars, with little impact on the structure of the large macroeconomic models of IPEA. The main result was the exchange of ideas between Brazilian and Japanese researchers and, even though the models constructed during this exchange did not represent a major improvement in relation to what already existed at IPEA before the project, new lines of investigation were opened for future research.

Regarding the annual model, the reduced and simpler version developed by the Japanese experts has a high pedagogic value, in the sense that it is straightforward illustration of how macro models work for those not familiar with the topic. The forecasts and explaining power of such a reduced version are obviously inferior to those of IPEA's large-size model, but its structure is much easier to understand and modify.

Regarding the quarterly model, there was little progress in relation to the model already developed by IPEA. The main contribution was the incorporation of new tests about the fit and accuracy of the model (the so known "final test") to IPEA's research methodology.

Regarding the monthly model, so far the results have not been useful for IPEA basically because of the short size of the sample used. Since the passage of time will naturally eliminate this restriction, there is no obstacle for IPEA's staff to improve the monthly model in the near future.

The main result of the project was the study about the consumption expenditures of Brazilian households. This was the 1st study of its kind based on the data collected by the POF, and its results were carefully and very well written to facilitate its understanding and application by other researchers.

6 – Recommendations and lessons learned

In general, the design and planning of the project should have had taken in account whether or not there were already Brazilian studies on the topic, as well as the accumulated knowledge of Brazilian researcher in the are of macro modeling. This would allow a better definition of the cooperation between Brazil and Japan and improve the choice of Japanese experts. In addition to this general point, and considering future projects of the similar nature, we recommend that:

a) The long-term Japanese expert should have a more technical background and profile.

b) The exchange program should try to match the demands of the local institution to the cooperation offered by JICA.

c) The short-term Japanese experts should be chosen based on their availability to continue to work in the project after they returned to Japan or, in case this is not possible, based on their previous knowledge of the existing model of the local institution and its expertise in the specific techniques that can be incorporated in the existing model through a short-run consulting work

d) The project should have had more clear objectives and goals as, for instance:

- Specific topics and sub-topics to be investigated by each Japanese and Brazilian researcher.
- Specification and number of research papers to be written by each participant researcher.
- Deadline to deliver and review the research papers.
- Evaluation system for the research papers where, for instance, each participant would evaluate the contribution of another participant (cross-refereeing) before the final publication of the results.
- Creation of a specific web site to post and disseminate the results and the methodology of the project.

Finally, the project experienced two main problems. Because it did not start from zero, that is, there was already a model constructed by IPEA and a reasonable knowledge of the topic by IPEA's staff, it would be necessary to choose Japanese experts that could effectively contribute to improving the existing IPEA's models instead of pursuing parallel models. Second, the long-term Japanese expert, who could have solved the first problem, limited himself to bureaucratic tasks, related to the visit of the short-term Japanese experts, and did not have a major role in the technical execution of the project, that is, macroeconomic modeling.

Appendix

A1: Documents Consulted:

- E-mails exchanged by IPEA's staff and the Japanese experts on the development of the project.
- Record of Discussion – regarding the project "Institutional support to IPEA in the area of macroeconomics."
- Work Plan for JICA Experts, regarding the "Joint Study Project on Institutional Development of Macroeconomic Planning."
- *Formulário para Solicitação de Atividades de Cooperação Técnica* of Ministry of Foreign Relations of Brazil.

A2: Papers and publications consulted:

- Asano, S., Barbosa, A.L.N.H., Fiuza, E.P.S. (2001). "Efficient and equitable commodity taxation: micro-simulations based on an estimated Brazilian consumer demand system." Rio de Janeiro: IPEA, Texto para Dicussão 835.
- Banco Central do Brasil, Relatório de Inflação, vários números.
- Cavalcanti, M.A.F.H., Carvalho, L.M., e Carvalho, J.C.J. (2003). "MOPSE-B: O Modelo Macroeconométrico Anual do IPEA." IPEA: Rio de Janeiro, mimeo.
- Fukuchi, T. e Cavalcanti, M.A.F.H. (2003). *Modeling the Brazilian Economy.* IPEA/JICA (livro contendo os principais resultados do projeto).
- Muinhos, M.K. e Alves, S.A.L. (2003). "Medium-Size Macroeconomic Model for the Brazilian Economy." Brasília: Banco Central do Brasil, Texto para Discussão 64.
- Muinhos, M.K., Alves, S.A.L. e Riella, G. (2002). "Modelo Estrutural com Setor Externo: Endogeneização do Prêmio de Risco e do Câmbio." Brasília: Banco Central, Texto para Discussão 42.
- Reis, E.J., Cavalcanti, M.A.F.H., Castro, A.S., Rossi, J.L., Rildo, E. e Hernandez, B.M. (1999). "Model for Projections and Simulations of the Brazilian Economy." Rio de Janeiro: IPEA, Texto para Discussão 619.

A3: Interviews:

- Paulo Mansur Levy – Current Director of Macroeconomic Studies of IPEA
- Eustáquio J. Reis – Director of Macroeconomic Studies at the time of the cooperation between JICA and IPEA.
- Marco Antônio F. H. Cavalcanti – Economist at the Division of Macroeconomic Studies (DIMAC) of IPEA and the main Brazilian researcher responsible for the project in the area of macroeconomic modelling.
- Eduardo P. S. Fiúza – Economist at the Division of Macroeconomic Studies (DIMAC) of IPEA and the main Brazilian researcher responsible for the project in the area of consumer behavior.

A4: List of questions used in the interviews:

Effectiveness: were the objectives achieved?

- In what the degree were the models improved in relation to what existed before the project?
- Was there an increase in the dissemination and utilization of IPEA's models (web site, publications, seminars, courses, etc)?
- Did the project result in an increase in the analytical capacity of IPEA's staff (courses, training, etc)?
- Did the project improve the research infrastructure at IPEA (library, software, hardware, etc)?
- Did the project result in new models and/or an increase in the knowledge of IPEA's staff about this topic?

Efficiency: were the objectives achieved in the most efficient way?

- How the project inputs were allocated?
- How many people participated in the project? What was the task of each one of them? How do you evaluate the performance of each one of them?
- Were the resources for the capacity-building of IPEA's staff used in the most efficient way?
- How many people participated in the exchange program? Was the exchange program efficient?
- How much was allocated to the improvement of IPEA's research infrastructure?
- What was the impact of the project on IPEA's research infrastructure?

Relevance: were the project objectives important to the Brazilian society and/or Government?

- Were the theoretical closure and macroeconomic scenarios used by IPEA's models in accordance with the orientation and strategy of the economic policy of the Brazilian Government?
- Were the models and forecasts by IPEA used by other branches of the Brazilian Government (Central Bank, Ministry of Finance, Ministry of Planning, National Congress, etc)?
- What is the accuracy degree of IPEA's macroeconomic forecasts? What is the accuracy in comparison with the existing alternatives?

Impact: what was the impact of the project on the Brazilian Government and/or society?

- What is the impact of IPEA's models on the teaching and research in the area of macroeconomics in Brazil?
- What is the impact of IPEA's models and forecasts on the policy design and decisions by the Brazilian Government?
- What is the impact of IPEA's models and forecasts on the decisions of private economic agents (banks, firms, etc) in Brazil?

Sustainability: are the results permanent or temporary?

- Is IPEA capable of maintaining, developing and improving the models without JICA's cooperation?

- Does IPEA have enough people capable to maintain and improve the models?
- Does IPEA have enough technical and financial resources to maintain and improve the models?


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