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**Labor Market, Poverty and Policies: An Integrated-CGE-
Microsimulation Analysis for Indonesia**

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MPIA2 - Labor



Labor Market, Poverty and Policies: An Integrated-CGE- Microsimulation Analysis for Indonesia

RESEARCH PROPOSAL

Presented to
PEP Network

By

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&

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INDONESIA

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1. Abstract (100 to 250 words)

It has been suggested that labor market plays an important role in the poverty reduction in Indonesia. However, little do we know on how exactly the labor market structure interacts with poverty reduction policies and how it will likely affect the outcome of the policies. This research proposal addresses a question on how labor market structure such as sectoral mobility, skills mobility, formal-informal duality, and regulatory setting affect the outcome of poverty reduction policies for the case of Indonesia. To answer such question, we propose to develop an integrated micro-simulation CGE model. This model will combine the CGE model with household survey data in an integrated manner that make possible the accurate calculation of various measure of poverty and inequality indicator. This will be the first of its application for Indonesia. It is expected that this research will improve our institution's standing in economic modeling in Indonesia and contribute more to research-based public discourse and policy making.

2. Main research questions and core research objectives

The main research question to be addressed is how labor market structure such as sectoral mobility, skills-mobility, formal-informal duality, and regulatory setting affect the outcome of poverty and inequality reduction policies for the case of Indonesia.

Specific research questions to be addressed are:

- What is the impact and how effective (measured quantitatively) various policies which are addressed specifically to reduce poverty and inequality in Indonesia? The scenario to be formulated are: (a) Education policy by way of increasing the supply of skilled or semi-skilled labor (such as clerical).¹ (b) Increasing labor productivity; (c) Investment in certain prioritized sector² through increasing capital stock in those sector.
- How labor market structure such as the extent of labor's sectoral mobility, skills-mobility (the degree to which labor market is segregated across skill level), formal-informal duality, and regulatory setting (i.e., a minimum wage policy applied to certain sector such as formal labor market) affect the outcome of poverty reduction policies outlined above³.

3. Scientific contribution of the research

¹ This is confirmed as the strategy formulated in the official planning document for 2011-2014, or national medium term planning document.

² As outlined in the official national planning documents.

³One example of a study in line of this approach where labor market rigidities is interacted with other scenario is a study by Bernard Decaluwé & Yazid Dissou & Véronique Robichaud, 2004 "Regionalism and Labour Market Structure: A CGE Analysis of UEMOA Customs Union," Journal of African Economies, Oxford University Press, vol. 13(2), pages 302-332, June.

a) Literature and knowledge gaps on labor market setting and poverty reduction policies in Indonesia

Among the most important works on the linkage between labor market and poverty reduction in Indonesia are by Huppi and Ravallion (1991) and Mason and Baptist (1996). Both papers used similar methodology. Huppi and Ravallion (1991) suggest that labor market plays an important role in the poverty reduction. They, further, conclude that during 1980s, welfare gains within the rural labor market are found to have been important. In a stronger conclusion, Mason and Baptist (1996) suggest that the poverty reduction during the early 1990s was contributed primarily by within-sector welfare gains (mostly within self-employed farm households) rather than due to inter-sectoral labor mobility. Both of these two important papers suggest that labor mobility are important factors in poverty alleviation strategy.

Both of these papers, however, are more of observatory or descriptive trying to explain (through the decomposition of poverty reduction into within sector improvement and inter-sectoral population shift) the poverty reduction that had occurred during certain period but not to find the root cause of the reduction let alone the contribution of specific policies.

There are some literatures addressing the impact of labor market policies, but limited only to the minimum wage policy such as Suryahadi et al (2001), Alatas and Cameron (2003), Alatas and Cameron (2008), and being the most relevant one is Bird and Manning (2008). Bird and Manning (2008) address the connection between minimum wages and poverty in Indonesia and suggest that minimum wage policy is unlikely to be an effective antipoverty instrument in Indonesia.

This research attempts to ask a bigger question: to what extent policies can contribute to the poverty reduction and how they interact with different possible labor market structure in Indonesia. An example of such question is how would the poverty reduction outcome of a policy that increase the supply of skilled labor (through education) be different, had Indonesia did not employ a minimum wage policy in the formal sector? Another different question is to what extent a policy to promote technical change in agriculture resulting in different poverty reduction outcome had the labor mobility across sectors were limited? All of these questions relate to various different set of scenarios which can only be answered by an economic model. An economic model such as a CGE model is designed to serve that purpose.

References

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Asep Suryahadi, & Wenefrida Widyanti & Daniel Perwira & Sudarno Sumarto, 2001. "The Impact of Minimum Wage Policy on Wages and Employment in Developing Countries: The Case of Indonesia," *Economics Study Area Working Papers* 38, East-West Center, Economics Study Area.

Alatas, Vivi & Cameron, Lisa, 2003. "The impact of minimum wages on employment in a low income country : an evaluation using the difference-differences approach," *Policy Research Working Paper Series* 2985, The World Bank.

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Bird, Kelly & Manning, Chris, 2008. "Minimum Wages and Poverty in a Developing Country: Simulations from Indonesia's Household Survey," *World Development, Elsevier*, vol. 36(5), pages 916-933, May.

b) Methodological contribution: the first integrated micro-simulation CGE for Indonesia

There are a number of CGE models in Indonesia that attempts to analyze the impact of policies on poverty on inequality. However, to our knowledge, no attempt has been made to construct an 'integrated'-micro-simulation CGE model. What we mean by 'integrated' is a CGE model where the number of households in the model is what is available in the household survey data. The model solve by GAMS alone. The micro-macro model developed by Bourguignon et al. (2003), combined household survey data with the CGE model but it is not integrated. The CGE model and the micro-simulation are separated and run by different software, GAMS for the CGE model and STATA for the micro-simulation. This approach has disadvantage in a sense that the household heterogeneity does not affect price determination. Price is determined in the CGE model without completely taking into account the household survey data.

Several approaches have been adopted in dealing with income distribution analysis in a CGE model for Indonesian case. The traditional one is the representative household method, where it is assumed income or expenditure of households follows a certain functional form of distribution. There has been growing evidence to suggest, that variation within the one single household-category is important and can significantly affect the results of the analysis (Decaluwé et al. 1999). Household-specific shocks, such as transfers to targeted household groups, cannot be analyzed with the representative household approach. Studies on Indonesia by Sugema et al. (2005) and Oktaviani et al. (2005), among others, belong to this type of approach.

The second approach is the socioeconomic class method. Several CGE studies for Indonesia use this approach, based on the official household classification of the SAM, which divides the population into 10 socioeconomic classes. Studies by Resosudarmo (2003), Azis (2000), and Azis (2006), among others, follow this approach.

A third approach is a top-down method, in which price changes produced by the CGE model are transferred to a separate micro-simulation model, such as a demand system model or an income-generation model. Price changes are exogenous in this micro-model, and so the endogeneity of prices is ignored. Studies for Indonesia by Bourguignon et al. (2003), and Ikhsan et al. (2005) are among this type of approach⁴.

The fourth approach is the integrated multi-household method, which consists of disaggregating or increasing the number of household categories by the size of expenditure or income per capita. If the categories are detailed enough, such as expenditure (or income) centiles, the distributional impact such as poverty incidences or standard inequality indicators can be estimated more precisely. For Indonesia, INDONESIA-E3 model (Yusuf, 2008) uses this approach.

The last approach is the integrated micro-simulation-CGE method, which consists of multiplying the number of households into as many households as are available in the household level data. Increasing computation capacity allows a large number of households to be included in the model. It allows the model to take into account the full set of detailed information available from household-level data, and avoids pre-judgment about aggregating households into categories. All prices are endogenously determined by the model, and no prior assumption of parameter distribution is necessary. Data reconciliation is a difficult problem and the size of the model can become a constraint on the application of this approach. This microsimulation-CGE model has been implemented in various studies including Annabi et al. (2005) for Senegal, Plumb (2001) for U.K., Cororaton and Cockburn (2005) and, Cockburn (2004) for Nepal, Cororaton and Cockburn (2006) for the Philippines. However, this approach has not been yet applied for the case of Indonesia.

This approach outperforms all of the first four methods outlined above in terms of the incorporation of within households distribution. The biggest advantage of this model however, is the flexibility in terms of the output of the model. Because it models explicitly the whole household survey data, any type of poverty and inequality indicators can be readily calculated. In addition, those indicators can also be distinguished into various relevant groups such as regions or socio-economic characteristics. In summary, this research is a good opportunity to develop this kind of model for Indonesia.

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⁴ Some attempt has been made to improve this approach by providing feedback from the micro-model to the CGE model. Belonging to this category among others are studies by Filho and Horridge (2004) for Brazil, and Savard (2003) for the Philippines.

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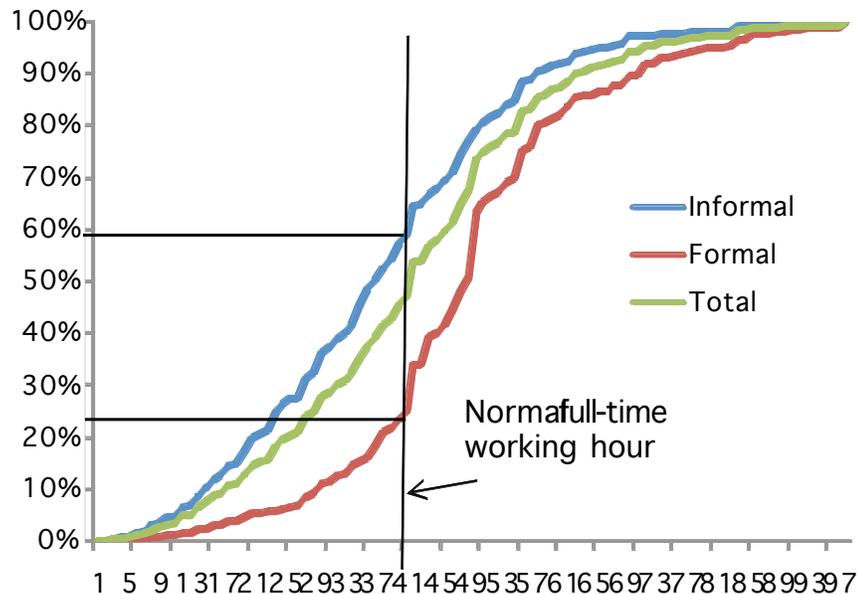
Yusuf, Arief Anshory, 2008. "INDONESIA-E3: An Indonesian Applied General Equilibrium Model for Analyzing the Economy, Equity, and the Environment," Working Papers in Economics and Development Studies (WoPEDS) 200804, Department of Economics, Padjadjaran University, revised Sep 2008.

c) Policy relevance

According to the most recent National Medium Term Development Plan 2010-2014 published by the Ministry of National Development Planning, inclusive economic development is the government development priority. Inclusive development planning is defined as a development that gives opportunity for all without exception. Inclusive economic development is supported by both poverty alleviation strategy and employment policies such as education, training, and improving skills so more people will be involved in development (Ministry of National Planning, 2009, p71).

Indonesian current government has been campaigning the pro-growth, pro-poor, and pro-job policies. However, most of the attention is usually on reducing open unemployment yet the structural problem are well beyond that. The most related critical problems are underemployment, low competitiveness due to labor market regulation, and low absorption of formal labor market and consequently the high portion of low-paying informal labor market. Almost 60% of labor working in low-wage informal sector works below normal working hour (see Figure 1). All of these structural problem can be the root cause of poverty incidence in Indonesia.

Figure 1. Cummulative Distribution of hour of works



Source: Labor Force Survey 2007

The politics of minimum wage regulation has also been problematic due among others to our recent democratization. Compared to the past, now labor union is a lot stronger politically. We are at the edge of losing competitiveness from our neighbouring countries such as Vietnam and China. This research can assess whether this policy is really beneficial for poverty reduction and with appropriate dissemination can influence policies.

Education policies such by means of increasing access to primary and secondary education has always been on the policy agenda⁵, yet there is always mismatch problem in Indonesia. Our most recent data suggests for example that the highest unemployment rate is among those with vocational education. Not only that such factor as employment opportunity (demand) and supply plays a role, but also the structural setting where this supply and demand meets. This research has a potential to shed some new lights on this aspects.

With regard to access to policy making, we have quite many experience in dealing with policy makers such as government agencies and other relevent institution. For example, recently, our institution (CEDDS) has been regularly a partner of International Labor Organization (ILO) in conducting labor market studies.⁶

Another of our important work in the past is a study sponsored by USAID titled “Indonesia’s Employment Protection Legislation: Swimming Against the Tide?” in 2004. This work has been quoted in many other important studies and as a result of that in 2006 the president has requested some of our researchers involved to conduct in-depth study to revise the severance payment regulation.

Reference

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d) Methodology

The methodology to be used in this research is an integrated micro-simulation Computable General Equilibrium Model of the Indonesian economy. A CGE model can be described as a set of n non-linear equations and n endogenous variables representing the optimizing behaviour of consumers and producers of various commodities in a competitive market setting. Due to a large number of variables and equations involved, the system of equations is solved by computer using special software like GAMS. An integrated-micro-simulation-CGE model, as also previously described, is a CGE model

⁵ National Medium Term Development Planning 2010-2014 (2009), Ministry of National Development Planning.

⁶ This works are among others with ILO on the Assessment of the Labor Market for the Employment Intensive Manufacturing Sectors, Including an Improved Understanding of Present and Future Opportunities for Employment in Selected Sub-Sectors: Case of Indonesian Food and Beverage Industry, 2008 or with Indonesian Central Bank on the structure and mobility of labor in textile Industry in Bandung Metropolitan Area, 2008

where the number of representative households in the model is as many as the number of households in a representative national household survey, and this is typically in thousands.

We will use PEP standard CGE model⁷ (Decaluwé et al, for this research for two reasons. First, PEP standard model has been widely used in the PEP network and this research is also a capacity-building in nature, so we can expect the most of technology transfer if using this model. Secondly,

Some modification to the standard model needs to be done as the strategy to answer some specific research questions outlined in this research. They are among others are the following:

- 1) The model needs to be modified so that it can incorporate various labor market regulation, such as minimum wage policy. For a minimum wage policy, this can easily be done through exogenizing wage for selected type and endogenizing labor supply for that type. For most model this can be done simply by changing the closure not modifying the equation in the model.
- 2) The model needs to be modified to incorporate different degree of skill-mobility. This can be done through differentiating degree of skill-classes. More classes means more mobility, less classes means less mobility. The distinction of classes will be based on data availability.
- 3) The model needs to be modified to incorporate different sectoral labor mobility. This can be done through differentiating labor market clearing conditions. Market clearing conditions for certain type labor can be structured to be sectoral or group-sectoral specific. For example, agricultural labor can only be mobile among different agricultural sector but not to manufacturing sector and so on.

Among the biggest challenge would be constructing the Social Accounting Matrix for the CGE model because the matrix would be so large (the number of household would be more or less 60,000 households as this is the number of observation in our household survey data) but yet still consistent and balance. Reconciliating household survey data with the national data will be another challenging task. However, we have experience in doing similar thing for constructing INDONESIA-E3 model (Yusuf, 2006⁸).

e) Data requirements and sources

- Indonesian official Social Accounting Matrix (Source: Indonesian Statistics Office, for the year 2005, or 2008 if the update is available)
- Indonesian official Input-Output Table (Source: Indonesian Statistics Office, for the year 2005, or 2008 if the update is available)

⁷ <http://www.pep-net.org/programs/mpia/pep-standard-cge-model/>

⁸ Yusuf, Arief Anshory (2006), Constructing Indonesian social accounting matrix for distributional analysis in the CGE modelling framework. Working Papers in Economics and Development Studies 200604, Department of Economics, Padjadjaran University. available at <http://ideas.repec.org/p/unp/wpaper/200604.html>.

- Indonesian National Socio-Economic Survey/SUSENAS (Source: Indonesian Statistics Office, for the year 2005, or 2008 depending on the availability of 2008's SAM and I-O table)
- Indonesian Labor Force Survey/SAKERNAS (Source: Indonesian Statistics Office, for the year 2005, or 2008 depending on the availability of 2008's SAM and I-O table)

The integrated-Microsimulation CGE model require us to construct our own Social-Accounting-Matrix (SAM) by combining all of those data source. The approach will be similar to that used by Yusuf (2006).

Reference

Arief Anshory Yusuf, 2006. "Constructing Indonesian Social Accounting Matrix for Distributional Analysis in the CGE Modelling Framework," Working Papers in Economics and Development Studies (WoPEDS) 200604, Department of Economics, Padjadjaran University, revised Nov 2006.
<http://ideas.repec.org/p/unp/wpaper/200604.html>

f) Consultation and Dissemination Strategy

Stake holder's involvement

There will be an element of the project where we need inputs from stake holders and also we need some reaction or responses to our assumptions or results. To this end we plan conduct a focus group discussion and a series of interview with relevant stake holders including policy makers. Issues to be raised among others are labor market structure, labor regulation and its effectiveness and so on.

Academic publication

Because one of the target of this project is to improve individual's and institution's capacity, the output of this projects will be disseminated through working papers (our working paper series) and finally international refereed journal articles. Publications in good journals will have observable impacts not only in the present but also future prominence of this institution.

Seminars and conference

Our research results will be disseminated through participating in national and international conference.

Newsletters and newspaper articles

To increase the outreach to more general audience, a special newsletter describing the summary of the research will be distributed to relevant stake holders especially policy

makers. In addition, a popular media opinion article will be written highlighting the study results to more general audience.

Policy briefs targeted to government officials/agencies

We will publish and distribute policy briefs from this research and distribute in some of the event regularly by BAPPENAS (Ministry of Planning), or even sent directly to government officials at BAPPENAS and other relevant agencies.

Past consultation and dissemination involving team members

We have quite many experience in consultation and dialog with government officials in many of our past research projects. Below is just the most recent ones and involve the team member of this research.

Dr. Arief Anshory Yusuf (the team leader) has been intensively collaborated with various ministries including Ministry of National Development Planning (BAPPENAS) as well as Ministry of Finance. Most recently, Dr. Yusuf is the key person who leads the capacity building for BAPPENAS (under AusAID grants) on inter-regional economic modeling⁹ to help the agency better shape their policy formulation. The project has been a while for one year and will be extended for the next three years. This opportunity will also be used to disseminate this proposed research (PEP), for example, by including this model in the capacity building especially for those who are more in charge in poverty alleviation within the agency. The head of our institute (CEDS) before given to Dr. Yusuf was just recently appointed as the Minister of National Development Planning (Head of BAPPENAS), this also indicates our good network with this agency.

Our other team members, Ms. Pipit Pitriyan and Mr. Ahmad Komarulzaman is also now intensively involved in a prestigious Global Development Network 4 years Project on Strengthening Institution to improve public sector accountability. This project involve a lot of consultation with government agency during the course of the project, such as education, health, and water sector agencies. We have been conducted many workshop and policy dialogues where both Ms. Pitriyan and Mr Komarulzaman are importantly in charge.

g) List of team members

Team leader:

Dr. Arief Anshory Yusuf

Sex: male

Age: 37

Dr. Yusuf has an extensive experience in economy-wide modeling and has a large number of previous works related to poverty and income distribution (see attached CV). Among the most recent relevant recent works are:

⁹ For more information about this model or activity see <http://ceds.fe.unpad.ac.id/ircge/>

Yusuf, Arief A. and Budy Resosudarmo, Mitigating Distributional Impact of Fuel Pricing Reform: Indonesian Experience, *Asean Economic Bulletin*, 25(1), 2008, 32-47.

Warr, Peter, Menon, Jayant and Yusuf, Arief A. (2009), Regional Economic Impacts of Cross-Border Infrastructure: A General Equilibrium Application to Thailand and Lao PDR, No 35, Working Papers on Regional Economic Integration, Asian Development Bank.

Warr, Peter and Yusuf, Arief A., (2009), International food prices and poverty in Indonesia, Departmental Working Papers, Australian National University, Economics RSPAS.

Team members:

Mr. Akhmad Komarulzaman

Sex: male

Age: 28

Mr. Ahmad has some experiences in economy-wide modelling. It was started from being part of to developing the INDOTERM, an inter-regional CGE model for Indonesia. Then, deepen this field during taking the graduate degree and writing the master thesis. Recently, Ahmad involved in developing AGEFIS model as well as being an instructors in several applied general equilibrium model trainings (see attached CV).

Ms. Pipit Pitriyan

Sex: female

Age: 31

Ms. Pipit Pitriyan has a formal training in CGE modeling from Monash University but has more experience in dealing with household survey data analyzing such issue as labor market, poverty, and education (see CV)

h) Expected capacity building

Institutional capacity building

Our institution, Center for Economics and Development Studies (CEDS), Padjadjaran University has a very clear mission: producing research output with high-quality academic content in addition to more policy-oriented research, but the approach has been a combination of output-motivated activities within a capacity-building framework. This aims at the dual target in term of research output as well as staffs and institutional development¹⁰. The capacity building approach of PEP-Network fits our mission.

In Indonesia, CEDS has been known for its expertise in economic modeling especially CGE modeling. However, this started only recently after our initial collaboration with

¹⁰ <http://www.ceds.fe.unpad.ac.id>

Monash University for a capacity building project in CGE modeling in 2006. We, then, established a CEDS CGE Modeling Unit (CCMU)¹¹. Building capacity in economic modeling needs to be continuing and sustainable as it takes years of practice for a novice modeler to be able to master the tool. Consequently, related activities need to be continually supported. The opportunity offered by PEP-Network is among the answers to this need.

Our research also often touches the human development aspect such as poverty and inequality and we always want to sharpen our analysis on this aspect. Modeling and Policy Impact Analysis (MPIA) of the PEP-Network offers a capacity building in which we don't yet have the capacity but we want to pursue namely a better tool to analyze the poverty and distribution impact of policies and shocks within the CGE modeling framework.

Individual capacity building

We also expect that this research will improve the capacity of individual researchers involved. Despite Dr. Yusuf's (Team leader of the project) years of experience in CGE modeling, he is still in its increasing learning curve and is really keen to be able to master better modeling approach to analyze distributional impact. Explicitly modeling the household survey data into a CGE model is among his keen interest. In this project, Dr. Yusuf will lead, oversee the research, and also transfer his previous knowledge to other team members.

Mr. Ahmad Komarulzaman has just recently finished his Master from Europe completing a thesis using a CGE model, hence, has a lot of potential to become an able modeller and researcher. He also has some previous research experience using a CGE model prior to his master study. Ahmad, however, doesn't have experience in dealing with developing a large CGE model. In this project, Ahmad will be in charge mostly in the CGE model programming (in GAMS) under very close supervision from the team leader.

Ms. Pipit Pitriyan has a formal training in CGE modeling from Monash University, Australia and was involved in one of our research project using a CGE model. However, Pipit has even more experience in dealing with household survey data analyzing such issue as labor market, poverty, and education. Pipit, in this project, will be dealing mostly on the aspect of labor market and poverty and supporting the CGE model by preparing the household survey data. Pipit will also be supervised closely by the team leader. It is expected that through this project, Pipit's skill in household level data handling and analysis (using STATA software) will be improved, her knowledge on CGE modeling will be widened, and she will have more variety of tools to analyze economic issues of her interest namely poverty, education, and labor market.

i) Any ethical, social, gender or environmental issues or risks that should be noted.
None.

¹¹ <http://www.ceds.fe.unpad.ac.id/unit/ccmu.html>

j) **List of past, current or pending projects in related areas involving team members** Name of funding institution, title of project, list of team members involved

Year	Funding institution	Project title	Team members (Who are to be involved in PEP research)
2006	AusAID	Economic Modeling Capacity Building to Increase an Indonesian Regional Public University's Participation in National and Regional Policy Making <i>Development of INDOTERM, an inter-regional CGE model for Indonesia</i> ¹² (collaboration with Monash University)	Arief Anshory Yusuf, Pipit Pitriyan, Ahmad Komarulzaman
2008	Ministry of Finance	AGEFIS: Applied General Equilibrium for FIScal Policy Analysis ¹³	Arief Anshory Yusuf
2009	Ministry of Finance	AGEFIS-E: Extension of AGEFIS incorporating energy-emissions and carbon taxation module	Arief Anshory Yusuf, Ahmad Komarulzaman
2008	ILO	Assessment of the labor market for the employment intensive manufacturing sector	Pipit Pitriyan
2008	ILO	Feasibility study to establish a short course and masters program in labor market development	Pipit Pitriyan
2007-2008	The World Bank	Education and the Labor Market: Skill Mismatch, Vocational Education Job-related Training	Pipit Pitriyan
2007	The World Bank	Employment protection legislation and labor market flexibility: international evidence and lessons for Indonesia	Pipit Pitriyan
2006	IRM, Japan	Strategy and Policy of Labor Union on Industrial Relationship Dispute in Multinational Automotive Company	Pipit Pitriyan
2003	USAID	Indonesia's Employment Protection Legislation: Swimming Against the Tide?	Pipit Pitriyan
2007	ADB	Does Road Improvement Reduce Poverty? A General Equilibrium Analysis for Lao PDR – Paper	Arief Anshory Yusuf
2007	ACIAR, Australia	Technical change in agriculture in Thailand and Indonesia: A general equilibrium analysis	Arief Anshory Yusuf
2007-2008	CSIRO, Australia	Regional Economic Modelling for Indonesia: Implementation of the IRSA-INDONESIA-5	Arief Anshory Yusuf
2009	ADB	Regional Economic Impacts of Cross-Border Infrastructure: A General Equilibrium Application to Thailand and Lao PDR	Arief Anshory Yusuf
2007-2008	EEPSEA-IDRC	The Distributional Impact of Environmental Policy: The Case of Carbon Tax and Energy Pricing Reform in Indonesia	Arief Anshory Yusuf

¹² Publication from this activity are among others: Mark Horridge & Glyn Wittwer, 2006. "The Impacts of Higher Energy Prices on Indonesia's and West Java's Economies using INDOTERM, a Multiregional Model of Indonesia," Working Papers in Economics and Development Studies (WoPEDS) 200607, Department of Economics, Padjadjaran University, revised Aug 2006.

¹³ Publication from this activity: Arief Anshory Yusuf & Djoni Hartono & Wawan Hermawan & Yayan, 2008. "AGEFIS: Applied General Equilibrium for FIScal Policy Analysis," Working Papers in Economics and Development Studies (WoPEDS) 200807, Department of Economics, Padjadjaran University, revised Oct 2008.

