

DRAFT PROPOSAL

**Advanced Clean Cars: Economic Assessment, Data, and
Decision Tools to Support Policy and Market Development**

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Abstract

Advanced Clean Cars (ACC) can make an essential contribution to California's goals for sustainable prosperity, but to fulfill their promise these technologies will have to be adopted in significant numbers across state. Public policy and industry marketing are working hard to facilitate this, but doing so most effectively requires a better understanding of how the public responds to these product innovations and, conversely, how the products will influence behavior and economic activity. Despite the emergent nature of the ACC market, some data already exists on consumer preferences and use characteristics. The basis of evidence still needs to be strengthened, however, as do the methods of assessing it. We have already seen, for example, that ACC adoption patterns are very heterogeneous across the state. This poses both a challenge and an opportunity. The challenge is to better understand how and why high adoption rates occur, but this presents the opportunity of extending adoption to much larger consumer groups. To support public and private capacity for this, as well as public and private dialog and agency to promote ACC adoption, this project proposes a comprehensive agenda for data development, behavioral modeling, forecasting and decision tools for economic assessment of ACC. Using a combination of secondary and original data, state-of-the-art behavioral models and forecasting tools, we hope to deliver a new generation of decision software for the next generation of clean transport hardware.

1 Introduction

Advanced vehicle technologies, such as those covered by the California Air Resources Board's (ARB) Advanced Clean Cars initiative, hold the promise to significantly reduce greenhouse gas and toxic emissions, while changing conventional energy use patterns and reducing our dependence on exhaustible resources. Through emission reductions achieved by a combination of fuel efficiency and fuel substitution, a more modern and diverse vehicle fleet can also confer economic savings on households that translate into net economic stimulus, stimulating aggregate employment and economic growth across the state. Research by the Principal Investigator (PI) of this project and others have demonstrated two important facts:¹

1. Standards for emission reduction and energy efficiency, whether in vehicles or other consumer durables like electric appliances, can stimulate California economic growth and employment. These net benefits are larger the more extensive is the adoption of such technologies.
2. Because they are widely dispersed across the economy, these benefits will be enjoyed by California households whether they individually buy ACCs or not. In other words, the overwhelming majority of the state's population has a stake in ACC deployment, not only for environmental but for economic reasons.

Thus we see that the idea of a tradeoff between environment and economic growth is not supported by evidence, and the two findings above, reinforced by a decade of published research, reveal that ACC deployment is strongly grounded in the public interest. Because of California's status as a bellwether of technology innovation and adoption, demand patterns arising from ACC policy are also of interest to the national and global vehicle industry, and for these reasons a

¹ See most recently, Roland-Holst (2012), as well as others, e.g. Huang et al (2012).

natural common interest exists between public and private actors to promote and better understand ACC adoption patterns and prospects.

As one might expect from such a widely used consumer good, and particularly when considering its most innovative categories, ACC adoption patterns have been very heterogeneous. To date, these vehicles have had very diverse receptions in different geographic markets, demographic segments, and generic product lines (sedans, compacts, light trucks, etc.). This presents both a challenge and opportunity. At the moment this behavior can't really be explained in a definitive, evidence-based way, and mainly anecdotal information is available. At the same time, better understanding of successful markets, because they remain a small percentage of total demand, might unlock very large adoption potential across the state economy.

For these reasons, existing consumer sentiment data must be re-examined for its ability to capture this heterogeneity and, because we are dealing with an innovative product category, new surveys must be designed that reflect the impact of these new technologies as well as the diversity of market responses. Finally, we need a new generation of behavioral models, calibrated to these new data structures, to effectively inform policy design and implementation. The same reasoning applies for private sector stakeholders, who could put these new data and models to immediate use for more effective marketing.

The following proposal sets forth a three-part strategy to develop these information sets and decision tools for public and private use. Its ultimate goal is to elucidate the benefits to individuals and society from innovative new vehicle technologies and support enhanced adoption of them to help sustain prosperity in

California. We know the risks of unsustainable emission paths are real, now we need to better understand this important pathway to greater economic security.²

2 Objectives

The proposed research seeks to develop data and empirical decision tools that will be as advanced and up-to-date as their subject matter, a new generation of transportation technologies that will emerge over the next two decades. With an equal amount of prior experience in economic assessment of environmental policy, the PI and his team have a comprehensive strategy for delivering these new information and analysis resources. Because the technologies in question are rapidly emerging, new data and analysis will be essential to provide guidance for both public and private sector actors. Doing this work under public sponsorship will ensure that both the data developed and findings obtained reach the largest possible audience. In this way, these research products can support more effective policy, as well as vehicle and supporting sector marketing strategies to enhance deployment of ACCs.

To be more specific, this project will contribute to six of ARB's expressed interests in deployment of ACC technologies. Each of these is listed below (*italics*), accompanied by a descriptive summary of its relevance to the proposed research. Emphasis among these topics will vary, and can be adjusted before and during the project on the basis of dialog with ARB staff.

1. *New car market trends. Beyond basic descriptive statistics on vehicle sales mix and technology penetration rates, researchers are asked for innovative or novel approaches, methods, etc. to characterize changes in the new vehicle fleet over time and how the Advanced Clean Car program*

² See, e.g. Roland-Holst and Kahrl (2012) for more extended discussion of these issues.

affects those trends. These approaches, methods, etc. should allow for ongoing characterization of the existing new vehicle fleet as well as some ability to extrapolate, forecast, or project future trends.

To be most effective, development and marketing of new vehicle technologies should be responsive to the fundamentals of both existing and emerging consumer needs and tastes, as well as to broader economic conditions. The proposed research has two main objectives that will support this, both from the policy and industry perspectives. Our synthesis of existing data on consumer preferences, and especially our proposal to develop original data, will provide new information resources to elucidate the determinants of emerging vehicle demand. The project will then incorporate this into a new generation of forecasting tools applied to the California economy with particular reference to vehicle markets. Taken together, these knowledge products will offer new insight for both public and private stakeholders, as well as standards for future extensions of this work.

2. *Technology impacts on consumer welfare. Given the array of vehicle technologies that may be employed to comply with more stringent standards, a method and estimation are needed on the consumer response to vehicle technology changes resulting from the regulations. Do consumers like the new technologies with their associated fuel savings, or are the new vehicles undesirable? Is it possible to identify effects of the program on vehicle sales or consumers' choices among vehicles? Is there evidence of hidden costs of the new technologies? In addition to consumer satisfaction with these technologies, changes in consumer welfare may also occur from rebound effects -- that is, changes in miles driven due to vehicle technologies with lower operating costs -- independent of fuel price effects.*

While the modeling component of this research would be prospective, data collection will be retrospective, assembling the results of existing consumer surveys and conducting new ones independently and in collaboration with the industry. Both these datasets are expected to contain valuable information on taste and use history, ranging from their expectations and original adoption

decisions to actual user experiences and their qualitative characteristics. From this information, we plan to develop profiles of user sentiment across a broader spectrum of vehicle technology options. These results will inform most of the questions posed above, and we plan to report specifically on consumer sentiment in the project. Beyond this, we will use statistical inference to extend our survey data to project expected reactions to more diverse technology options.

3. *Affordability of new vehicles. Projected increases in new vehicle prices may be offset by expected fuel savings. However, from the perspective of a new car buyer, an increase in upfront costs may pose a barrier to entering the new car market. A method is needed for quantifying or indexing new vehicle affordability and estimating the extent to which higher upfront costs limit market entry into various vehicle segments/types and the ways in which traditional or alternative leasing/purchasing mechanisms may evolve to address the combination of those higher upfront costs and reduced fuel expenditures. Further research is also needed to understand how affordability influences the dynamics between the new and used vehicle markets.*

Across a very large literature on technology adoption, the issue of initial cost, or the “financial hurdle” is one of the most important. Like efficient vehicles, new consumer products may have complex present-value characteristics, and existing evidence suggests that individuals have very diverse responses to this. These include a spectrum of apparent discount rates, varying price/cost expectations, and highly variable attitudes to nonfinancial product characteristics. The best response to this on the part of policy and industry is to anticipate such heterogeneity and respond according to their capacity. For industry, this means targeting development on technologies with diverse feature sets and transparent value/cost characteristics, supported by financing and communication strategies that facilitate consumer perception of positive net present-value. For policymakers, options include standards, public information, and financial incentives. Standards are outside the scope of this research, but strategies for public information and sustainable incentive schemes will be studied carefully.

In any case, as a practical matter, both policy and industry strategy need to be informed by rigorous evidence on both central tendencies and distributions of consumer behavioral characteristics. Precisely this evidence will be one of the main products of the proposed research. Moreover, we propose to build models that evaluate scenarios for different technology, marketing, and public policy alternatives. Because these will be embedded in an economywide forecasting model, these assessments can improve understanding of the larger potential gains for consumers, producers, and other public and private stakeholders.

4. *Economic Impacts. California could become the center of the emerging ZEV industry, on both the vehicle or infrastructure sides. Research is needed that examines the structure of the ZEV industry within California and beyond to identify the highest value elements in the supply chain and to distinguish the current and future impacts of policies directly affecting regulated parties or affiliated businesses from indirect impacts to other sectors of the economy. Continued research is also needed on the current and future regional and national impacts of the regulatory program on overall economic output and employment.*

The proposed research will not disaggregate the upstream elements of vehicle production, meaning it won't shed light directly on component supply patterns. Having said this, results of our projections regarding final sales will certainly support investment decision-making by supply chain actors. It is well understood that California's path breaking vehicle efficiency standards are making the world's eighth largest economy into a giant incubator for these technologies. Better-informed expectations regarding pathways for adoption of these technologies will reduce risks for those already interested in committing to develop them, including the state's robust venture community.

5. *Incentives based on behavioral economics. Ongoing developments in the field of behavioral economics suggest that incentives could be structured in an alternate manner to be more effective at persuading consumers to adopt new vehicle technologies or behaviors. Research proposals are requested that rigorously evaluate possible incentives for purchasing near*

or pure zero-emission vehicles based on principles of behavioral economics.

6. *Innovative approaches to transform the new vehicle market. A sustainable market cannot rely indefinitely on publicly-funded incentives. Research proposals are requested evaluating innovative approaches to increase consumer awareness and demand for zero-emission vehicles beyond conventional strategies such as financial incentives or vehicle perks (free parking, HOV access). Approaches may include, but are not limited to, the use of social media, alternative vehicle ownership or financing structures, or demonstration projects.*

Our synthesis of existing consumer survey data, combined with the original data we intend to develop during the project, will support a new generation of statistical models that simulate adoption behavior. These models will be designed to measure responses to substantive product characteristics and product perceptions, with special reference to efficiency properties and financial performance. These insights can support more targeted approaches to technology promotion. Historically, the state of California has taken a fairly generic approach to vehicle demand, establishing standards and using direct financial subsidies and privileged access incentives. These strategies have been successful, but public funds have an opportunity cost, privileges by definition are limited in scope, and neither are really sustainable at the intended long-term scales of adoption.

Financial incentives may remain important in the short and medium term, but public policy can continue to support new vehicle adoption with new strategies that build on the state's experience and better target emerging consumer populations. Identifying and simulating such strategies is an important component of this research project, and these can be more effectively targeted with the kind of data that will be developed. Potential approaches to be studied will include, among others, product testing and labeling programs that have proved successful in the electric appliance market, alternative ownership and use programs (e.g. leasing, sharing, etc.), and demographic targeting. In addition to

program scenarios, we plan to evaluate the capacity of alternative existing and emerging media channels to reach potential consumers. Vehicle demand exists in nearly demographic of the state's population, but media are increasingly being segmented. To more effectively promote new technologies, both public and private communications need to adapt to this reality. If this is done carefully, media segmentation can actually facilitate progress because it permits more precise consumer targeting.

3 Technical plan

The project will be committed to three technical components. First, we will develop a comprehensive information resource comprised of secondary and original data on consumer sentiment and behavior related to vehicle adoption and use, with particular emphasis on ACC. This data, in addition to becoming a new public information resource, will then be used with the most advanced econometric techniques to estimate transport choice models related to ACC. The second technical component will then integrate these demand-side behavioral models with the PI's prior efforts to model ACC use characteristics, yielding complete simulation frameworks to assess the impacts of ACC deployment at the market and economywide levels. Finally, the simulation tools will be applied in a series of illustrative scenario frameworks to demonstrate how they can support more effective public policy and private promotional strategies.

3.1 Consumer Behavior

As was observed above, consumer decisions regarding expenditure represent complex and heterogeneous behavior patterns.³ When the good in question is a high cost durable that provides a broad spectrum of individual and group

³ Across a vast literature, see e.g. Gowrisankaran and Rysman (2009), Knittel (2009), Bhat et al (2009).

services, like vehicles, consumption decisions have to reconcile purchasing power with a wide array of competing temporal and social considerations. Thus it is hardly surprising that vehicle demand has been a very rich subject of economic and other behavioral research, extending over more than half a century (e.g. Suits: 1958) to the present day. The emergence of ever more innovative vehicles has complicated the work of demand analysis, but these challenges must be overcome if public policy and marketing are to successfully promote adoption of vehicles with better sustainability characteristics. This component of the research project will contribute to that goal in two ways, collecting and developing evidence on the determinants of vehicle demand and developing empirical behavioral models of this demand. These models will later be used to predict demand patterns and evaluate alternative marketing and policy scenarios.

3.1.1 Data Development

Synthesis of Existing Sources

We are fortunate to be conducting vehicle demand analysis at a point in time when we can draw on the immense research literature that is already extant on this subject. Thousands of research reports and publications have appeared on this topic over the last generation, and these show clear lines of methodological progress in both sampling and estimation that will advance our own work. From the former, we plan to assemble all authoritative public data on vehicle demand responses, both in the US and elsewhere, with three purposes.

Firstly, we plan as part of the project to develop a web-based portal that can act as a clearinghouse for access to these data. Secondly, we will mine this archive ourselves to support the behavioral estimation discussed in the next section.

Finally, once the data portal is established with public source data, we intend to approach individual vehicle manufacturers and leading distributors (including internet traders like eBay) with a proposal to share their own survey data. Although this may arouse issues of competitiveness, we hope that they will see

the advantages of contributing to a larger data commons that can support independent research to advance new vehicle adoption and diffusion. There are reasons for optimism in this regard. As a GM spokesperson said recently – “The Advanced Clear Car program allows us to do what we do best – that is to innovate.” To be truly successful, ACC must represent more than just innovative hardware, it must be supported by innovative software (i.e. data and decision tools) that effectively promote adoption on the scale envisioned by the state and industry stakeholders.

Direct surveys

Despite the extensive data resources that already exist on vehicle demand, it should be recognized that we are dealing with a rapidly emerging technology. Because of the new and dynamic nature of the ACC category, existing survey data will only partially inform us about expected consumer behavior. For this reason, we plan to develop more targeted direct survey activities that can shed light on consumer preferences toward the differentiated products appearing on the light vehicle market. These activities will make a unique contribution to our own estimation models, marketing and scenario results. Because this project is publically funded, they will also contribute to the public knowledge base to support evidence-based policy, more effective ACC marketing, and better public information on consumer products.

The detailed sampling strategies and survey instruments will be developed during the course of the project or as part of a more refined proposal. Generally speaking, however, we want to enhance existing demand data in three ways:

1. Greater and more up-to-date product variety – ACC vehicles are a quite specialized subset of the existing and emerging vehicle stock. Although manufacturers are striving to embed them into existing categories as substitutes for a growing range of traditional vehicles, they have use and financial characteristics that set them apart in practice and perception. For

- this reason, surveys that target this category need to be more intensive, with particular reference to preferred new characteristics and by comparison to prior choices. In terms of product characteristics, sampling instruments need to take account of changing taste for vehicle services, including electronic features, advanced audio, guidance, safety, etc. as in addition to fuel efficiency characteristics. The history of consumer products makes clear that single-feature innovations have much less market potential than those that are packaged with a constellation of complementary technology, taste, and use characteristics.
2. Sampling differentiation across diverse demographics – ACC vehicles are arriving on the market in a more heterogeneous and specialized demographic environment, as more and more buyers choose new vehicles on the basis of individual preference and self-association, from increasing segmented social groups. Segmentation is the result of modern lifestyles, with higher proportions in California of single earners and an evolving media landscape that has adapted to this. This is particularly true for new car sales, where the emerging demographics are more likely to be single, younger, and embedded in self-identified (career, locational, etc.) social groups. To explain demand across this mosaic of groups, products and especially communication (public and marketing) need to be likewise differentiated.
 3. Prospective surveying – Because we are working to understand adoption in an emerging technology environment, it is essential to engage consumers on a prospective basis, i.e. to sample their attitudes toward future vehicle design, functionality, and appurtenant services. In addition to understanding their attitudes toward existing or announced models, we want to anticipate their expected needs and preferences. This information can be of great value not only to product designers, but also to the research and public policy communities.

A combination of direct and indirect (internet) sampling techniques will be used. For all the new survey activity, the project will adhere to the highest standards of human subjects research, as reflected in the PI's home institution, the University of California. Subject to discussion with ARB, we can further vet our human subjects standards to an independent auditing body or Institutional Review Board (IRB) for each and every survey conducted. All data, questionnaires, and human subjects review material will be made public.

3.1.2 Statistical Modeling

Using the data resources assembled in the last activity, we will undertake a comprehensive research program of behavioral modeling. Although we have initial priorities for estimation strategy and model choice, this activity will begin with an exhaustive review of relevant research literature. Empirical research on vehicle demand is extensive and very deep, with many recent innovations that are worthy of extension across the project's expanded data sources. The ACC emphasis of this project mandates a more ambitious approach, however, reaching out to the research literature on adoption/diffusion of other high-tech products (e.g. Carranza: 2010). This field has grown exponentially with its subject matter, and here we expect to find many ideas that are worthy of being tested in the context of new vehicle technology. Of particular importance are consumer goods that have been developed and adopted preferentially by "sentinel" consumer groups, the young, professional, and technologically literate group that act as standard setters in these product categories. By elucidating their adoption behavior, we can better understand how to reach this group and leverage the imitation benefits of capturing their interest. A responsible study of this literature is an ambitious activity in itself, we believe essential, but it cannot be completed without dedicated project resources. A review of this literature, assessing its potential to contribute to our understanding of ACC adoption, can be an important intermediate deliverable of this project.

While the literature review is underway, we will begin behavioral modeling with estimation strategies at the forefront of current research in the sector. As the reviewers are well aware, transport demand econometrics has a long and distinguished history, even having been cited in an award of the Nobel Prize for Economics (McFadden: 1974). As was already mentioned, the PI for this project has made the most recent contributions to the economics of ACC use characteristics (Roland-Holst: 2012), but on the demand side a long and diverse literature needs to be synthesized and distilled. Many earlier contributions (e.g. Beggs et al: 1981 and Hill: 1987) are hampered by outdated product and consumer characteristics, while others (Kurami, Turrentine, and Sperling: 1997) hold very important lessons for application today.

Among more recent contributions, we intend to test our data on methods that are emerging along two veins of vehicle adoption research. The first of these is what might be termed state-of-the-art mainstream modeling, as typified by the work of Cirillo and Xu: 2011 and Abbe and Toledo: 2007. These discrete choice models are extending the original work of McFadden through his immediate disciples (e.g. Train: 2003) to much more complex models that take account of dynamics and expectations. These models are making important contributions to our understanding of responses to product innovation, changing tastes, product complexity (including the role of complements and substitutes) and extending them across our new data resources will adapt these insights to the emerging ACC market in California.⁴

A second important strand of research, represented by e.g. Adjemian, Lin, and Williams: 2010, examines spatial demand characteristics and methods for modeling behavior from samples that include more detailed (i.e. census based) consumer characteristics. These approaches are very harmonious with one of the salient objectives of this project, to improve our understanding of

⁴ See, e.g. Busse, Knittel, and Zettlemeyer: 2009.

heterogeneity and use this to target ACC policy and marketing more effectively. Spatial models represent an important prototype for this approach, and we plan to extend this kind of statistical analysis to a broader set of attributes for both consumers and vehicles. This will lead to important extensions of existing work, and the data resources we develop are designed to support this. Each of the main streams of modeling developed will be completely documented for public information, with these reports as potential deliverables of the project.

3.2 Market and Economic Forecasting

The complexities of today's economy are such that policy makers relying on intuition or rules-of-thumb alone are unlikely to achieve optimal outcomes. In the context of a vehicles, the challenges of understanding market drivers are even greater because these are long-lived consumer durables, purchased and used across an extremely diverse demographic. For these reasons, policy makers need better visibility regarding existing and emerging demand determinants to anticipate policy impacts. This kind of understanding is best supported with detailed evidence on actual consumer behavior, combined with scenario analysis tools that allow ex ante testing of strategies before they are implemented. Using the data resources obtained in its first phase, this project will develop and implement a number of such tools.

We propose to use forecasting models at two levels – the vehicle market and the overall California state economy. For vehicle market modeling, we plan to apply our advanced behavioral models (developed in activity 3.1 above) on the demand side to scenarios that represent alternative vehicle technologies, pricing, and marketing strategies.

3.2.1 Market Forecasts

While industry experts traditionally undertake market forecasting, often with proprietary data, the information resources we are developing will be public and

can support very useful independent and public interest research. In terms of findings, industry research emphasizes impacts on corporate balance sheets. Independent research can broaden the assessment perspective to include social criteria like environment, energy independence, and indirect economic benefits. From a methodology perspective, industry research in one sector may also not take full advantage of research innovations from elsewhere. For example, an extensive academic literature exists on technology adoption and diffusion, much of which is relevant, but remains to be applied to, vehicle demand. We want to apply these methods to improve general understanding regarding the emergence of ACC technologies, with the goal of informing public opinion and contributing to more inclusive standards for assessing the prospects of these technologies.

The vehicle industry does a great deal of its own market research, yet it is fair to say that most of these contributions extend traditional thinking about sector fundamentals. Like a most clean technologies, however, ACC vehicles present rapidly evolving choices to consumers, more akin to high tech sectors like IT and biotech. The space of these product characteristics is also changing along many dimensions, something that places new demands on traditional market research. At the same time, new data sources are emerging with the expansion of information technology, and we are only beginning to devise statistical methods for exploiting this. Because of these dynamics, we plan to pursue a three-part approach to market forecasting for ACC adoption/diffusion.

1. Estimation of vehicle demand patterns from new data. Here we will draw on a large and established literature, applying best practices to forecast demand under alternative scenarios for technology emergence, prices (vehicle and energy), and behavioral assumptions.
2. Forecasting and simulation of AAC adoption/diffusion patterns by adapting established models for other modern technologies.

3. Indicative simulation based on inference from emerging information sources, including Internet marketing, sales, and demographic data (e.g. Athy et al: 2011). This research component will be more prospective, offering methodological guidelines for future research. It is doubtful if definitive projections can be obtained with current data resources, but we see this as an important direction to promote future research.

3.2.2 State Economy Forecasts

Given the pervasive importance of vehicle ownership and transportation services generally, significant industry trends have implications for the entire state economy. The vehicle sector alone is a major source of direct and indirect employment, income, and tax revenue. Trends in this sector directly influence macroeconomic cycles, and systemic industry changes have the potential to shift the economy's fundamentals. This is especially true for emerging technologies like ACC, which have the potential to alter practical and financial use characteristics related to a significant share of household income.

As we have also learned from the application of ARB models to AB32 assessment, there are many reasons to take account of economywide policy impacts. Most importantly, the direct costs of environmental policy often fall upon a limited number of interest groups, who may have high individual stakes and are easily organized. Environmental benefits, by contrast, usually accrue to much larger and more diverse groups. Even though these benefits might be individually smaller, they often aggregate to larger economic values than mitigation costs. Beneficiary group size and lower individual gains often make it more difficult to arouse and organize support for socially beneficial policies, but economywide assessments make it easier to identify these benefits and communicate them. This activity buttresses the public interest and also helps policy makers better anticipate the adjustment needs of others. Finally, a better sense of aggregate

impacts can help identify resources for compensatory and/or incentive measures that might facilitate implementation.⁵ For all these reasons, the present research has an important component of policy and ACC market assessment that will be implemented with a statewide forecasting model.

To model the impacts of ACC adoption on the state economy, we will use the Berkeley Energy and Resources (BEAR) model. BEAR is a detailed and dynamic economic simulation model that traces the complex linkages across the California economy as these arise from changing policies and external conditions, like energy prices and technological change.⁶ Because it follows detailed interactions between California consumers, enterprises, and the state's fiscal activities, BEAR captures the myriad of indirect effects that can arise from more narrowly targeted industry or other policies. Taken together, such indirect effects often outweigh direct ones, in many cases in partially countervailing directions. For example, an emission fee may impose direct costs on polluters, but the economywide benefits, including energy savings, averted public health costs and even climate damages, can be much larger. A comprehensive assessment of both direct and indirect effects is essential to fairly appraise the public interest in such policies.

BEAR has already been used to produce estimates on several occasions for CalEPA/ARB, beginning with the legislative run-up to passing the 2005 Global Warming Solutions Act.⁷ Successive rounds of BEAR analysis were broadly in accord with the state's findings and buttressed public awareness in legislative discussion of Assembly Bill 32. In the current phase of climate action dialogue, more specific policy design features and impacts have been subjected to

⁵ A classic example of this is free permit distribution to facilitate early compliance with emissions trading systems, but there are many others.

⁶ The BEAR model is the most up-to-date and detailed forecasting model of the California economy. It has been peer reviewed and is fully documented in Roland-Holst (2010).

⁷ Indeed, BEAR forecast results are quoted in the Executive Order establishing AB32

intensive public and private scrutiny. Policies toward vehicle energy use, including efficiency standards and the LCFS, are part of the AB32 legacy and will continue to influence the state economy for the foreseeable future.

For the present analysis, we propose to incorporate a variety of scenarios for ACC deployment and diffusion, incorporating available information regarding industry plans and applying the calibrated consumer behavior models developed in the first phase of the project. As Roland-Holst (2012) has shown, the actual pattern of adoption, in terms of numbers and types of vehicles purchases, can have a substantial impact on statewide long-term fuel demand and household expenditure patterns. In particular, significant fuel savings have the potential to stimulate demand and employment growth across a wide range of other consumer goods and service sectors, delivering a substantial growth dividend to the state economy. In this sense, stakeholders in many other sectors have a material interest in the scope and pace of ACC adoption, and this dynamic needs to be better understood if its full benefits are to be understood. As a platform for integrating our new micro data and behavioral models with the wider economy, BEAR forecasting framework supports exactly this perspective.

The BEAR model will be adapted to include new behavioral models developed in activity 3.1 above. Combined with the PI's previous work including ACC use and financial characteristics, this will provide the basis for more complete economywide assessment of ACC adoption, including estimates of overall consumer savings, the economic stimulus effects of these, and a range of fuel, emissions, and fiscal indicators. A report on these, assessing a variety of policy and market deployment scenarios will be a potential primary deliverable of the project, comprising a technical monograph and a policy brief that distills the main messages for a wider audience.

3.3 Marketing and Policy Strategy Development

All the data and analytical products of the proposed research can support decision making by both public and private strategic actors, including ARB in its appraisal of ongoing and future ACC policies and the vehicle sector itself in developing product and marketing strategy. To make these efforts at enhanced ACC deployment more effective, this research will present a series of applications to policy analysis and marketing. Using the data that will be publically available, combined with behavioral models that will be published in research venues, we will show how policy alternatives can be more effectively simulated to improve scenario research and the ability of vehicle producers and distributors to target their products with evidence-based market research.

As a practical matter, we will implement the market models developed in the first and second phases of the project, using our new data to assess how adoption would proceed under different scenario assumptions about product characteristics, consumer attributes, and communication/media strategies. Because of diversity in all three categories, a wide range of scenarios will be needed to support effective targeting. This work will take the form to two separate research products, one for policy simulation and one for marketing analysis. Both are potential deliverables of the project. To make these studies most relevant, and to make clear their public contribution to the ACC initiative, the scenarios assessed and market strategies tested will be developed in direct consultation with ARB, its invited stakeholders, and vehicle industry representatives.

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Annex 2 – Estimated Cost by Task

Economic Assessment of Advanced Clean Cars

UC Berkeley

Task	Labor	Fringe Benefits	Subs, Consultants	Equip	Travel	Copy Print	Comm	Supplies	Misc	Overhead	Total
1.1	\$64,000	\$10,240	\$15,000	\$-	\$480	\$-	\$800	\$-	\$-	\$18,104	\$108,624
1.2	\$40,000	\$6,400	\$-	\$500	\$300	\$2,500	\$500	\$1,000	\$-	\$10,240	\$61,440
2.1	\$56,000	\$8,960	\$-	\$-	\$420	\$-	\$700	\$-	\$-	\$13,216	\$79,296
2.2	\$56,000	\$8,960	\$-	\$-	\$420	\$-	\$700	\$-	\$-	\$13,216	\$79,296
3	\$40,000	\$6,400	\$-	\$-	\$300	\$-	\$500	\$-	\$-	\$9,440	\$56,640
Total	\$256,000	\$40,960	\$15,000	\$500	\$1,920	\$2,500	\$3,200	\$1,000	\$-	\$64,216	\$385,296

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Research Themes

General Equilibrium Modeling
Regional Economic Development in Asia
Economics of Climate Change
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Fields of Specialization:

International Economics, Development Economics, Environmental Economics,
Applied General Equilibrium Modeling.

Higher Education:

B.A.	Economics	Case Western Reserve University
B.S.	Mathematics	Case Western Reserve University
M.A.	Economics	University of California, Berkeley
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June, 2003 – Present

Director, Rural Development Research Consortium, UC Berkeley
September, 2002 – Present

Managing Director, Berkeley Economic Advising and Research
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June, 2001 - Present

Research Associate, Centre for Economic Policy Research, London
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Professor, École Polytechnique Fédérale de Lausanne
September 1993 – June 1995

Senior Economist and Head of Program, OECD Development Centre, Paris
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Senior International Economist, United States International Trade Commission
August 1989 – July 1990

Occasional consultant to government agencies, World Bank, IMF,
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Publications

Books:

- A1. *California Climate Change: Risk and Response*, with F. Kahrl, University of California Press, Berkeley, 2012.
- A2. *Agriculture, Élevage et Pauvreté en Afrique de l'Ouest*, (ed.) with A.A. Mbaye and J. Otte, Editions CREA-Panafrika, Dakar, 2007.
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Articles and Chapters in Books:

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- B71. "Industry Structure and Conduct in an Applied General Equilibrium Context," with J.F. Francois, in J.F. Francois and K.A. Reinert (eds.), *Applied Methods for Trade Policy Analysis*, Cambridge: Cambridge University Press, 1997.
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- B103. "Distribucion de la Renta en un Modelo SAM de la Economía Española," with C. Polo and F. Sancho, *Estadística Española*, 125(1): 54-72, 1990.
- B104. "Adjustment Under Uncertainty with Computable General Equilibrium Models: General Theory and an Application to Korea," with I. Adelman and A. Sarris, *International Economic Journal*, 4(2): 1-20, Summer 1990.
- B105. "Overview of Uruguay's Trade Orientation and Domestic Economic Structure," Chapter 3 in World Bank and U.N.D.P., *Uruguay: Trade Reform and Economic Efficiency*, Washington, March 1990.
- B106. "Export Potential and the Effects of Export Expansion," with Federico Changuaqui, Chapter 4 in World Bank and U.N.D.P., *Uruguay: Trade Reform and Economic Efficiency*, Washington, March 1990.
- B107. "Import Protection and Import Liberalization," Chapter 5 in World Bank and U.N.D.P., *Uruguay: Trade Reform and Economic Efficiency*, Washington, March 1990.
- B108. "Bias and Stability of Multiplier Estimates," *Review of Economics and Statistics*, Vol. LXXI, No. 4, November 1989.
- B109. "Optimal Adjustment to Trade Shocks under Alternative Development Strategies," with I. Adelman, A. Sarris, and E. Yeldan, *Journal of Policy Modeling*, 11(4): 451-505, Winter 1989.
- B110. "Comments on Goulder and Eichengreen: Savings Promotion and Investment Decisions in a General Equilibrium Framework," in R. Feenstra (ed.), *Trade*

Policies for International Competitiveness, Chicago: University of Chicago Press and NBER, 1989.

- B111. "Macroeconomic Structure and Computable General Equilibrium Models," with S. Robinson, *Journal of Policy Modeling*, 10(3): 353-375, Fall 1988.
- B112. "On the Calibration of Computable General Equilibrium Models," *Proceedings of the Eighth Symposium of the International Forecasting Association*, Abstracted, Amsterdam, June 1988.
- B113. "The Social Accounting Matrix as a Tool for Analyzing Income Distribution," *Proceedings of the First International Symposium on the Social Accounting Matrix*, Naples, Italy, June 1987.

Research Conference Presentations:

- 1. "Global Economic Prospects for Increasing Developing Country Migration into Developed Countries." With D. van der Mensbrugghe, Human Development Research Paper No. 50. New York: United Nations Development Programme, Human Development Report Office.
 - 2. "Trade and Asian Regional Integration," Conference on Economic Challenges in Asia, Stanford Institute of International Development, Palo Alto, May 31 - June 3, 2006.
- "Empirical Methods for Integrating Regional and National Economic Policy Analysis," Development Research Center, State Council of the PRC, Beijing, March 27, 2006.
- "New Horizons for Rural Reform in China: Resources, Property Rights, and Consumerism," with F. Kahrl and D. Zilberman, international conference on "China's Policy Reforms: Progress and Challenges," Stanford Center for International Development, Stanford University, September 29 – October 1, 2005, Palo Alto.
- "California's Energy Future Scenarios for Economic Growth and Sustainability from the BEAR Model of the California Economy," presented at the *Second Annual CEC-PIER Climate Change Conference*, September 19, 2005, Sacramento.
- "Price Transmission and Poverty Alleviation: Local Effects of National Policies in Vietnam," presented at the *International Conference on Putting Development Back into the Doha Agenda: Poverty Impacts of a WTO Agreement*, 2-4 December 2004, The Hague.
- "China's Emergence and Changing Patterns of: Trade, Employment, and Investment in East Asia," *International Forum on China's Development: Key Challenges for China's Sustained Growth*, 10–11 November 11, 2004, Seoul.
- "China's Real Exchange Rate and Implications for East Asian Regional Trade and Investment Flows," presented at the *Third Annual Conference on China Economic Policy Reform*, October 14-16, 2004, Stanford Center for International Development, Palo Alto.
- "Chinese Economic Growth and Atmospheric Pollution: Challenges and Opportunity," with J. He, *Seventh Annual GTAP Conference on Global Trade Analysis*, 18 June 2004, World Bank, Washington.

“East Asian Trade Relations in the Wake of China’s WTO Accession,” International Symposium on *China’s Policy Reforms: Progress and Challenges*, Tsinghua University, Beijing, May 24-25, 2004, sponsored by the National Center for Economic Research, Tsinghua University, Beijing, PRC.

“CGE Methods for Poverty Incidence Analysis: An Application to Vietnam’s WTO Accession,” Seventh Annual *GTAP Conference on Global Trade Analysis*, 18 June 2004, World Bank, Washington.

“A Dynamic General Equilibrium Model of California Climate Change,” presented at the *First Annual CEC-PIER Climate Change Conference*, 9-10 June 2004, Sacramento.

“An Overview of China’s Emergence and East Asian Trade Patterns,” FACES Conference, 12 April 2004, Stanford University, Palo Alto.

“East Asian Trade Relations in the Wake of China’s WTO Accession,” invited address at *Evolution of Trade and Foreign Direct Investment in the Asia-Pacific*, Dissemination Workshops for the Center for Global Partnership (CGP) Project, “China, Japan, and the United States: Emergent Trilateralism in the Pacific Economy,” 23 May 2004, at the Development Research Center of the State Council of the PRC, Beijing, and 27 May 2004, at Japan Foundation Headquarters, Tokyo.

“China’s Emergence in a Regional Context: Projections to 2020,” presented at the international conference on “New Regionalism in East Asia” organized by the Asia Pacific Economic Forum (APEF) and Keio University, 20 September 2003, Tokyo.

“East Asian Regionalism: Implications of ASEAN+3 and other FTA Agreements,” Asian Development Bank Institute, 19 September 2003, Tokyo.

“Asian Trade Liberalization and U.S. Agriculture: Opportunities and Challenges,” with D. Zilberman, presented at the *Conference on Emergent Trilateralism in the Pacific Basin*, 3 June 2003, U.C. Berkeley.

“Future Prospects and Policy for Trilateral Trade among China, Japan, and the United States,” with Hiro Lee, presented at the *Conference on Emergent Trilateralism in the Pacific Basin*, 3 June 2003, U.C. Berkeley.

“Global Supply Networks and Multilateral Trade Linkages: A Structural Analysis of East Asia,” Asian Development Bank Institute, 18 December 2002.

“East Asian Patterns of Comparative Advantage,” Asian Development Bank Institute, 29 August 2002, Tokyo.

“An Overview of China’s Emergence and East Asian Regional Trade to 2020,” Asian Development Bank Institute, 22 July 2002, Tokyo.

“Emergent Trilateralism in the Pacific Basin: How will Globalization Affect China’s Trade with Japan, the United States and the Region?” paper presented at The Fifth Annual Conference on Global Economic Analysis, Taipei, June 2002, with Hiro Lee and Dominique van der Mensbrugghe.

“New Perspectives on Aid Effectiveness,” Annual Bank Conference on Development Economics, June 24-26, Oslo, Norway (ABCDE-Europe 2002), with F. Tarp.

“Regionalism versus Globalization in the Americas: Empirical Evidence on Opportunities and Challenges,” with Dominique van der Mensbrugghe, Symposium on Impacts of Trade Liberalization on Latin America and the Caribbean, Inter-American Development Bank, Washington, November, 2001.

“Trade and Transmission of Endogenous Growth Effects: Japanese Economic Reform as an Externality for East Asian Economies,” with Hiro Lee, presented at the Third Annual Conference on Global Economic Analysis, Melbourne, Australia, June 2000.

“The NAFTA and Industrial Pollution: Some Empirical General Equilibrium Estimates,” with K.A. Reinert, paper presented to the CEC Symposium on Assessing the Environmental Effects of Trade, Dallas, June 2000.

“Recovery and Transition for the Indonesian Economy,” with I. Azis, paper presented to the Conference on Sustainable Development in India and Indonesia, United Nations University, Tokyo, May 2000.

“On the Opportunity Cost of Japan’s Recession to Its Trading Partners,” with Hiro Lee, presented at the Workshop on Reform and Recovery in East Asia: The Role of APEC, Australian National University, Canberra, September 1999.

“Trade Reform, Environmental Policy, And Urban Public Health In Chile,” with John Beghin, Brad Bowland, Sébastien Dessus, and Dominique van der Mensbrugghe, presented to environmental policy seminars at CONAMA and Universidad de Chile, Santiago, 1997.

“Colombia and the NAFTA,” with M. Bussolo, presented at the Annual Meetings of the Latin American Economic Association, Bogota, 1997.

“A Free Trade Area in the Asian Pacific?” with Hiro Lee, presented at the Conference on “Economic Integration: Aspects of Fiscal and Trade Policies,” University of Tokyo, October 1995.

“The Potential Impact of the Removal of Japanese Tariff and Nontariff Barriers on Japan-U.S. Trade Patterns,” with Hiro Lee, presented at the Fifth International CGE Modeling Conference, Waterloo, Canada, October 1994.

“International Trade and the Transfer of Environmental Costs and Benefits,” with Hiro Lee, presented at the Annual Meetings of the American Economic Association, Boston, January 1994.

“Spain’s Entry into the EEC from a Social Accounting Perspective,” with J.C. Collado, presented at the Tenth International Conference on Input-Output Techniques, Seville, Spain, March 29 - April 2, 1993.

“Social Accounting Methods and International Trade,” with Hiro Lee, presented at the Tenth International Conference on Input-Output Techniques, Seville, Spain, March 29 - April 2, 1993.

“Modeling Chinese Growth and Trade from a General Equilibrium Perspective,” with H. Lee and D. van der Mensbrugghe, presented to the Development Research Center of the State Council, People’s Republic of China, Beijing, February, 1993.

“Design and Implementation of a Regional Economic Database for Chinese Policy Analysis,” presented to the Development Research Center of the State Council, People’s Republic of China, Beijing, February 1993.

“Trends in Comparative Advantage between the United States and Japan: Confluence of Interests or Potential for Conflict?” with Hiro Lee, presented to the Annual Meetings of the American Economic Association, Anaheim, January 1993.

“The Role of Nontariff Barriers in North American Trade,” with K.A. Reinert and C.R. Shiells, presented to the Annual Meetings of the American Economic Association, Anaheim, January 1993.

“A General Equilibrium Analysis of North American Economic Integration,” with K.A. Reinert and C.R. Shiells, presented at the NAFTA Economywide Modeling Conference, U.S. International Trade Commission, Washington, 1992.

“Bilateral Trade Between the United States and Japan and the Implications of Agricultural Protection,” with Hiro Lee, presented to the Second International CGE Modeling Conference, Waterloo, Canada, October 1991.

“Demand Specification for Tradeable Goods: A Comparison of Estimates with Flexible Functional Forms,” with K. Reinert and C. Shiells, presented at the Third Taskforce on Applied General Equilibrium Modeling, IIASA, Laxenburg, 1991.

“A General Equilibrium Approach to Spanish Trade and Industrial Policy,” with F. Sancho, presented at the *VI Jornadas de Economia Industrial*, Madrid, September 1990.

“The Debt Problem, Stabilization and Structural Adjustment, and their Socioeconomic Impact: the Case of Indonesia,” with E. Thorbecke, presented at the annual meetings of the American Economic Association, New York, December 1988.

“Parameter Choice for Computable General Equilibrium Models,” presented at the N.B.E.R. Workshop on Applied General Equilibrium Modeling, Palo Alto, April 1988.

“The Opportunity Cost of Defense Spending,” with S. Robinson and L.D. Tyson, presented at the annual meetings of the American Economic Association, December 1987.

“Modeling Structural Adjustment in the U.S. Economy,” with S. Robinson, presented at the annual meetings of the American Economic Association, December 1986.

“Notes on Differential Applications of Computable General Equilibrium Models,” presented to the Workshop on General Equilibrium Modeling, International Institute of Applied Systems Analysis, Vienna, August 1986.

“Distribution and Redistribution,” presented to the Fifth World Congress of the Econometric Society, Cambridge, Massachusetts, August 1985.

Invited Presentations¹

¹ These represent only invited appearances where all expenses were covered by the sponsor.

- F1. "Trade and Asian Regional Integration," Conference on Economic Challenges in Asia, Stanford Institute of International Development, Palo Alto, May 31 - June 3, 2006.
- D1. "Pro-Poor Livestock Policy in Four Archetype Developing Countries," UN Food and Agriculture Organization, Rome, June 21, 2006.
- D2. "Integrated Poverty Assessment for Livestock Policy," Ministry of Agriculture, Dakar, Senegal, May 8, 2006.
- D3. "Potential Gains from Integration of the Central Asian Republics," Asian Development Bank Trade Policy Coordinating Committee Workshop, Urumchi, April 7-10.
- D4. "Empirical Methods for Integrating Regional and National Economic Policy Analysis," Development Research Center, State Council of the PRC, Beijing, March 27, 2006.
- D5. "Strategic Economic Assessment of Avian Flu Control Measures," Faculty of Economics, Chulalongkorn University, Bangkok, March 21-22, 2006.
- D6. "China's Agricultural Development and Implications for California Agriculture," California Agribusiness Executive Seminar Monterey Plaza Hotel and Spa, Monterey, CA, March 5-7, 2006.
- D7. "Managing Greenhouse Gas Emissions in California: Preliminary Results from the BEAR Model," testimony before the California Environmental Protection Agency, Sacramento, February, 2006.
- D8. "A Giant Awakens: China's Global Economic Emergence and Implications for US Agriculture," Lecture presented to:
- D9. UC President's Advisory Commission on Agriculture and Natural Resources, April 7 2005, Berkeley.
- D10. Wells-Fargo National Agribusiness Finance Seminar, October 12, 2005, Las Vegas.
- D11. "Emergent Trilateralism in Developing Asia: Long Term Scenarios for Regional Growth and Trade," Lectures sponsored by the Asian Development Bank:
 - a. National Institute of Development Administration, Thailand, July 26, 2005, Bangkok.
 - b. Ministry of Finance of the PRC, July 22, 2005, Beijing.
 - c. Development Research Center, State Council of the PRC, July 21, 2005, Beijing.
 - d. Ministry of Finance, India, July 16, 2005, New Delhi.
 - e. Indira Gandhi Institute of Development Research, July 14, 2005, Mumbai.

- D12. "Economic Impacts of Reducing Trade Barriers in the Central Asian Republics," Ministry of Trade of Kazakhstan, June 7, 2005, Almaty.
- D13. Three Lectures on Reconciliation of Economic Accounts, Development Research Center, State Council of the PRC, June 4-5, 2005, Beijing:
 - a. "Micro and Macro Integration for Economic Policy Analysis"
 - b. "Reconciling China's Regional Input-Output Tables"
 - c. "Provincial Trade Flow Estimation for China"
- D14. "Trade and Growth Horizons for Asia," speech to the Annual Meeting of the Asian Development Bank, May 5, 2005, Istanbul.
- D15. "China's Emergence and Changing Patterns of: Trade, Employment, and Investment in East Asia," *International Forum on China's Development: Key Challenges for China's Sustained Growth*, 10–11 November 11, 2004, Seoul.
- D16. "Implications of Indian and Chinese Emergence for the Asian Regional Economies," address to the Research Department of the Asian Development Bank, 23 September 2004, Manila.
- D17. "Leveraging China's Emergence for Vietnamese Economic Growth," invited address to the Ministry of Agriculture and Rural Development, 20 September 2004, Hanoi, Viet Nam.
- D18. "Tracing Policy Impacts to the Household Level in Viet Nam," Second Annual PPLPI Steering Committee Meeting, 23 June 2004, United Nations Food and Agriculture Organization, Rome, Italy.
- D19. "Economic Analysis of Rural Poverty and Vietnam's WTO Accession," invited address to the resident mission of the World Bank, January, 2004, Hanoi.
- D20. "Globalization and Agricultural Development in Vietnam: Economic Assessment of Bilateral Trade Agreements," invited address to the Ministry of Agriculture and Rural Development, 12 January 2004, Hanoi.
- D21. "East Asian Trade Relations in the Wake of China's WTO Accession," invited address at *Evolution of Trade and Foreign Direct Investment in the Asia-Pacific*, Dissemination Workshops for the Center for Global Partnership (CGP) Project, "China, Japan, and the United States: Emergent Trilateralism in the Pacific Economy," 23 May 2004, at the Development Research Center of the State Council of the PRC, Beijing, and 27 May 2004, at Japan Foundation Headquarters, Tokyo.
- D22. "East Asian Regionalism: Implications of ASEAN+3 and other FTA Agreements," Asian Development Bank Institute, 19 September 2003, Tokyo.

- D23. “Asian Trade Horizons for the Latin American Economies,” address to the Inter-American Development Bank, 18 June 2004, Washington.
- D24. “WTO Accession and Domestic Reform: Vietnam’s Trade Horizons to 2020,” invited address to the Central Institute of Economic Management, 29 March 2004, Hanoi.
- D25. “Couching Dragon or Hidden Tiger? Threats or Opportunities from Open China,” address to invited delegations and experts at the Resident Mission of the Asian Development Bank, 14 January 2003, Beijing.
- D26. “Vietnamese Agriculture and the WTO,” invited address to the Ministry of Agriculture and Rural Development, 22 November 2002, Hanoi.
- D27. “Opportunities and Challenges from China’s Global Emergence: East Asian Trade Horizons to 2020,” Annual Meetings of the Asian Development Bank, 8 May 2002, Shanghai, PRC.
- D28. “China and the WTO: Perspectives to 2020” with Dominique van der Mensbrugghe (World Bank), presented at
 - a. Foreign Affairs Committee of the Chinese People’s Consultative Conference, Beijing, January 2002;
 - b. Global Prospects Research Department of the World Bank, Washington, February 2002.
 - c. The Fifth Annual Conference on Global Economic Analysis, Taipei, June 2002.
 - d. Asian Development Bank Institute, Tokyo, July 2002.

Research Reports:

- E1. Kazybayeva S, Otte J, and D. Roland-Holst (2008). A Social Accounting Matrix for Cambodia 2004. 27pp
- E2. Sriboonchitta S, Otte J, and D Roland-Holst (2009). A Social Accounting Matrix for Thailand, 2006. 33pp
- E3. Hong Hanh PT, Nhan LT, Otte J, and D Roland-Holst (2009). A Social Accounting Matrix for
- E4. Viet Nam, 2005. 53pp
- E5. Heft-Neal S, Otte J, and D. Roland-Holst (2009). Assessment of Smallholder Indigenous Poultry Producer Viability in Cambodia. 130pp
- E6. Kahrl F, Behnke D, and D Roland-Holst (2010). Smallholder Poultry Supply Chains in Lao PDR. 26pp
- E7. Burgos S, Hinrichs J, Otte J, Pfeiffer D, and D Roland-Holst (2008). Poultry, HPAI and Livelihoods in Viet Nam – A Review. 41pp
- E8. Burgos S, Otte J, and D Roland-Holst (2008). Poultry, HPAI and Livelihoods in Lao PDR – A Review. 38pp
- E9. Ifft J, Otte J, Roland-Holst D, and D Zilberman (2009). Poultry Certification for Pro-Poor HPAI Risk Reduction. 37pp
- E10. Burgos S, Otte J, and D Roland-Holst (2009). Poultry, HPAI and Livelihoods in Myanmar – A Review. 35pp
- E11. Heft-Neal S, Kahrl F, Otte J, and D Roland-Holst (2009). Assessment of Smallholder Indigenous Poultry Producer Viability in Thailand. 71pp
- E12. Sriboonchitta S, Chaiwan A, Heft-Neal S, Otte J, and D Roland-Holst (2010). Promoting Rural Livelihoods and Public Health in Through Poultry Contracting: Evidence from Thailand. 33pp
- E13. Sriboonchitta S, Chaiwan A, Kahrl F, Heft-Neal S, Otte J, and D Roland-Holst (2010) Livestock Promotion for Market Oriented Rural Poverty Alleviation. 16pp
- E14. Behnke D, Otte J, and D Roland-Holst (2010). Micro Contracting and the Smallholder Poultry Supply Chain in Lao PDR. 26pp
- E15. Changannakham P, Behnke D, Otte J, and D Roland-Holst (2010). Promoting Rural Livelihoods and Public Health Through Poultry Microfinance: Evidence from Lao PDR. 35pp

- E16. Behnke D, Otte J, and D Roland-Holst (2010). Assessment of Smallholder Indigenous Poultry Producer Viability After HPAI: Evidence from Lao PDR, 149pp
- E17. Heft-Neal S, Kahrl F, Otte J and D Roland-Holst (2010). Synthesis of Findings on Smallholder HPAI Risk and Control in Thailand and Cambodia. 39pp
- E18. Epprecht M, Vinh LV, Otte J, and D Roland-Holst (2007). Poultry and Poverty in Viet Nam
- E19. Otte J and D. Roland-Holst (2007). HPAI Control Measures and Household Incomes in Viet Nam
- E20. Roland-Holst D, Epprecht M, and J Otte (2008). Adjustment of Smallholder Livestock Producers to External Shocks: The Case of HPAI in Viet Nam
- E21. Otte J, Pfeiffer D, Soares-Magalhaes R, Burgos S, and D Roland-Holst (2008). Flock Size and HPAI Risk in Cambodia, Thailand, and Viet Nam
- E22. Ifft J, Otte J, D. Roland-Holst, and D Zilberman (2008). HPAI Control from a Demand Side Perspective
- E23. Ifft J, Otte J, Roland-Holst D, and D Zilberman (2008). Smallholder Poultry Supply Chains in the Ha Noi Region
- E24. Ifft J, Otte J, Roland-Holst D, and D Zilberman (2009). Smallholder Poultry Certification for Pro-Poor HPAI Risk Reduction
- E25. Otte J, Hinrichs J, Rushton J, Roland-Holst D, and D Zilberman (2009). Impacts of Avian Influenza on Poultry Production in Developing Countries
- E26. Heft-Neal S, Kahrl F, Otte J, and D Roland-Holst (2009). HPAI Risk Reduction and Smallholder Poultry Supply Chains – The Case of Thailand
- E27. Sproul T, Zilberman D, Roland-Holst D, and J Otte (2009). A Case for Multilateral Investment in Avian Flu Prevention
- E28. Sproul T, Zilberman D, Ifft J, Roland-Holst D, and J Otte (2009). Economics of Avian Flu Policy
- E29. Heft-Neal S, Otte J, and D Roland-Holst (2009). Pro-Poor HPAI Risk Reduction for Small-holder Poultry Supply Chains in Cambodia
- E30. Ifft J, Anh Tuan ND, Loc ND, Otte J, and D Roland-Holst (2010). Safety Certified Free-Range Duck Supply Chains Enhance both Public Health and Livelihoods
- E31. Ifft J, Anh Tuan ND, Loc ND, Otte J, and D Roland-Holst (2010). Poultry Demand in Ha Noi and Ho Chi Minh City

- E32. Zilberman D, Otte J, Pfeiffer D, and D Roland-Holst (2011). *Human and Environmental Health and the Future of Animal Agriculture*, Springer Verlag.
- E33. Otte J, Hinrichs J, Rushton J, Roland-Holst D, and D Zilberman (2008). *The Economic Impact of HPAI – A Global Review*. AI Symposium for Asian-Australian Association of Animal Production Societies (AAAP) Congress – 24 September 2008, Hanoi, Viet Nam
- E34. Metras R, Soares Magalhaes RJ, Hoang Dinh Q, Fournié G, Gilbert J, Dung DH, Roland-Holst D, Otte J, and D Pfeiffer (2009). Pilot study for the implementation of a traceability scheme for smallholder poultry farms in Northern Viet Nam. Poster presented at the SVEPM Meeting in London, UK, April 2009.
- E35. Fournie G, Metras R, Soares Magalhaes RJ, Hoang Dinh Q, Gilbert J, Dung DH, Roland-Holst D, Otte J, and D Pfeiffer (2009). Modelling the impact of vaccination on silent spread of HPAI H5N1 during the final stages of the small-holder production cycle in northern Viet Nam. Abstract and presentation at the 12th International Symposium on Veterinary Epidemiology & Economics (ISVEE), 10-14 August 2009, Durban, South Africa.
- E36. Ifft J, Otte J, Roland-Holst D, and D Zilberman (2009). Poultry certification for pro-poor HPAI risk reduction. Abstract and presentation at the 12th International Symposium on Veterinary Epidemiology & Economics (ISVEE), 10-14 August 2009, Durban, South Africa.
- E37. Ifft J, Otte J, Roland-Holst D, and D Zilberman (2009). Economic Decision Making of Smallholder Poultry Producers After Avian Influenza Outbreaks: Evidence from Viet Nam. Abstract and presentation at the 12th International Symposium on Veterinary Epidemiology & Economics (ISVEE), 10-14 August 2009, Durban, South Africa.
- E38. Otte J, Roland-Holst D, Zilberman D, and D Pfeiffer (2009). Pro-poor HPAI risk management in the greater Mekong region. Abstract and presentation at the 12th International Symposium on Veterinary Epidemiology & Economics (ISVEE), 10-14 August 2009, Durban, South Africa
- E39. Ifft J, Roland-Holst D, and D Zilberman (2009). Valuation of Safety-Branded and Traceable Free Range Chicken in Ha Noi: Results from a Field Experiment. Selected Presentation and Paper at the Annual Meeting of the American Agricultural Economics Association, Milwaukee, July 26-28, 2009.
- E40. Burgos S, Hong Hahn PT, Roland-Holst D, and SA Burgos (2007). Characterization of Poultry Production Systems in Vietnam. *Int. J. Poultry Sci.*, 6(10), 709-712
- E41. Otte J, Hinrichs J, Rushton J, Roland-Holst D, and D. Zilberman (2008). Impacts of avian influenza virus on animal production in developing countries. CAB

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- E42. Leibler JH, Otte J, Roland-Holst D, Pfeiffer DU, Soares-Magalhaes R, Rushton J, Graham JP, and EK Silbergeld (2009). Industrial Food Animal Production and Global Health Risks: Exploring the Ecosystems and Economics of Avian Influenza. *EcoHealth*, 6(1):58-70.
- E43. Ifft J, Roland-Holst D, and D Zilberman (2009). Impact of Quality Characteristics on Demand for Chicken in Viet Nam. *ARE Update*, Vol. 12, No. 4, Mar/Apr, 2009.
- E44. Metras R, Soares-Magalhaes R, Hoang Dinh Q, Fournie G, Gilbert J, Dung DH, Roland-Holst D, Otte J, and D Pfeiffer (submitted). A poultry tracing scheme for smallholders Viet Nam: results of a feasibility study. *Rev. Sci. Tech. Status?*
- E45. Pfeiffer D, Otte J, Roland-Holst D, Inui K, N. Tung, and D Zilberman (submitted). Implications of global and regional patterns of HPAI H5N1 virus clades for risk management. *Journal*; status?
- E46. Ifft J, Roland-Holst D, and D Zilberman (in prep). A Field Experiment to Value the Safety Labelled Free Range Chicken in Ha Noi. To be submitted to *Journal of Development Economics*
- E47. Ifft J, Roland-Holst D, and D Zilberman (in prep). Valuing Characteristics of Duck Certification: A Field Experiment in Ho Chi Minh City.
- E48. "WTO Service Standards and their Implications for Viet Nam Agriculture," Report No. 6, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2006.
- E49. "Leveraging China's Emergence For Viet Nam's Economic Growth Opportunities And Challenges For Agriculture," Report No. 5, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2005.
- E50. "Viet Nam's Trade With the Republic of Korea: Longer-Term Prospects for Agriculture," Report No. 4, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2005.
- E51. "Viet Nam's Trade With Japan: Longer-Term Prospects for Agriculture," Report No. 3, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2004.
- E52. "Viet Nam's Trade With The European Union: Longer-Term Prospects for Agriculture," Report No. 2, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2004.

- E53. "Viet Nam's Bilateral Trade Agreement With The United States: Economic Projections To 2020 And Implications For Agriculture," Report No. 1, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2003.
- E54. Household Income Determination in Vietnam: A Structural Analysis with Implications for Market Reform," with Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 63pp, January, 2003.
- E55. "Economic Reform and Structural Price Transmission: Lessons from an Emerging Asian Economy," with Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 56pp, January, 2003.
- E56. "A 2000 Social Accounting Matrix for Vietnam," with John Rand and Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 102pp, June, 2002.
- E57. "A 1999 Social Accounting Matrix for Vietnam," with John Rand and Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 84pp, January, 2002.
- E58. "Japan's Emerging Role in Economic Development and Cooperation in the Pacific Basin," with H. Lee, M. Ezaki, and S. Urata, report prepared for the Japan Foundation Center for Global Partnership, 1995.
- E59. "Labor Market Structure and Trade Liberalization in Morocco," with A.M. Maechler, paper prepared for the Country Economic Memorandum in Morocco, Washington: The World Bank, 1995.
- E60. "A General Equilibrium Modeling Facility for Morocco," report prepared for the Moroccan Ministry of Trade, Rabat, 1995.
- E61. "User's Manual for the Costa Rican General Equilibrium Model," report prepared for MIDEPLAN Costa Rica and USAID, 1994.
- E62. "Estimates of Non-agricultural Trade Control Measures for Applied General Equilibrium Analysis," report prepared for the OECD Development Centre, Paris, and the International Economics Division of the World Bank, Washington, August 1992.
- E63. "Tax Evasion and Tax Reform in a Low-Income Country: General Equilibrium Estimates for Madagascar," with M. Haddad and J. de Melo, The World Bank, December 1990.
- E64. "Export Responsiveness in U.S. Mining and Manufacturing Industries," with K. Reinert, U.S. International Trade Commission, Washington, D.C., June 1990 18pp.

- E65. "General Equilibrium Estimates of the Cost of U.S. Import Protection," with K. Reinert, U.S. International Trade Commission, Washington, D.C., June 1990, 135pp.
- E66. "Social Accounting Matrices and Exogenous Parameter Estimates for U.S. Trade Policy Analysis," with K. Reinert, U.S. International Trade Commission, Washington, D.C., June 1990, 49pp.
- E67. "Stabilization and Structural Adjustment in Indonesia: An Intertemporal General Equilibrium Analysis," Technical Paper, OECD Development Centre, Paris, March 1992, 75pp.
- E68. "General Equilibrium Modeling for Trade Policy: An Overview," with S. Tokarick, USITC, Washington, November 1989, 65pp.
- E69. "A General Equilibrium Analysis of Domestic Resources, Competitiveness, and Trade Policy in Ecuador," with E. Sadoulet, prepared for the Latin America Division of the World Bank, Washington, March 1989, 105pp.

Unpublished Working Papers:

- F1. "Asia's Long Term Growth and Integration: Reaching beyond Trade Policy Barriers," with Douglas Brooks and Fan Zhai, Policy Brief No. 38, Economic Research Department, Asian Development Bank, Manila, 2005.
- F1. "Behavioral and Empirical Perspectives on FDI: International Capital Allocation across the Asian Region," with Douglas Brooks and Fan Zhai, Discussion Paper, Economic Research Department, Asian Development Bank, Manila, 2005.
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- F8. "Emergence of China and the implications for regional trade initiatives in the Asian Pacific," with Hiro Lee and Dominique van der Mensbrugghe, Working Paper No. 2002-27, Kitakyushu: International Center for Economic Research, Tokyo, 2002.
- F9. "Global Agricultural trade and the Doha Round: What are the implications of North and South?" with Beghin, John C. and Dominique van der Mensbrugghe, Working Paper 02-WP 308, Staff Research Paper 10665, Department of Economics, Iowa State University, 2002.
- F10. "An Overview of China's Emergence and East Asian Trade Patterns to 2020," Discussion Paper No. 44, Asian Development Bank Institute, Tokyo, 2002.
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- F12. "Trade and Income Growth in Vietnam: Estimates from a New Social Accounting Matrix," with Finn Tarp and John Rand, Discussion Paper DP0201, Central Institute of Economic Management, Hanoi, and Nordic Institute of Asian Studies, Copenhagen, 2002.
- F13. "Rural-urban Dualism in Vietnam: Prospects for Redistribution Through Economic Reform," with Finn Tarp, Discussion Paper DP0202, Central Institute of Economic Management, Hanoi, and Nordic Institute of Asian Studies, Copenhagen, 2002.
- F14. "Economic Structure and Development in an Emergent Asian Economy: Evidence from a Social Accounting Matrix for Vietnam," with Finn Tarp and John Rand, Discussion Paper DP0203, Central Institute of Economic Management, Hanoi, and Nordic Institute of Asian Studies, Copenhagen, 2002.
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- F20. "International Trade and the Transfer of Environmental Costs and Benefits," with Hiro Lee, Technical Paper No. 91, OECD Development Centre, Paris, December 1993.
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- F22. "Trends in Comparative Advantage between the United States and Japan: Conflict or Confluence of Interests?" with Hiro Lee, Working Paper, Institute of International Studies, University of California, Berkeley, January 1993.
- F23. "Matrix Methods of Enterprise Accounting," Working Paper, Department of Economics, Mills College, November 1991.
- F24. "Export Earnings, Government Expenditure, and Household Incomes in Indonesia," Working Paper, Department of Economics, Mills College, September 1988.

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- G1. "Household Income Determination in Vietnam: A Structural Analysis with Implications for Market Reform," with Finn Tarp, revised and re-submitted to *Oxford Economic Papers*.
- G2. "Dragon by the Head, Dragon by the Tail: Bilateralism and Globalism in East Asia," with F. Tarp, revised and re-submitted to the *China Economic Review*.
- G3. "Regional Cooperation to Promote Trade and Investment," with Bahodir Ganiev and Richard Pomfret, draft chapter for a UNIDO report on Central Asian economic development, to appear.

David Roland-Holst - Biosketch



David Roland-Holst is an Adjunct Professor in the Departments of Economics and Agricultural and Resource Economics at UC Berkeley. Dr. Roland-Holst is one of the world's leading authorities on policy modeling, and has extensive research experience in economics related to environment, development, agriculture, and international trade, authoring three books and over 100 articles and chapters in professional publications. He has served in academic posts in the US, Europe, and Asia and conducted research in over 40 countries, working with US and foreign national governments, the Asian Development Bank, Inter-American Development bank, Organization for Economic Cooperation and Development (OECD), World Bank, and several United Nations agencies. Professor Roland-Holst holds a Ph.D. in Economics from UC Berkeley and is a US citizen.

1. Selected Research on Economics of Climate Change

Books

1. [*Climate Change in California: Risk and Response*](#), with F. Kahrl, University of California Press, Berkeley, 2012.
2. [*Trade and the Environment in General Equilibrium: Evidence from Developing Economies*](#), with John Beghin and Dominique van der Mensbrugghe, Norwell, MA: Kluwer Academic Publishers, 2002.
3. [*Economic Development and Cooperation in the Pacific Basin: Trade, Investment, and Environmental Issues*](#), with Hiro Lee, Cambridge: Cambridge University Press, 1998.

Published Articles and Chapters in Books

4. "[Growth and Structural Change in China's Energy Economy](#)," with F. Kahrl, *Energy* (2013), Forthcoming.
5. "[Plug-in Electric Vehicle Deployment in California: An Economic Assessment](#)," Working Paper, Department of Agricultural and Resource Economics, University of California, Berkeley, September.
6. "[China's Water-Energy Nexus](#)," with F. Kahrl, *Water Policy*, (2008), Forthcoming (16pp).
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8. "[What Hope for Climate Multilateralism?](#)" with F. Kahrl, *Update*, Vol. 11, No. 3, Jan/Feb, 2008.
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10. "Energy Scenarios for East Asia: 2005-2025," Comment, in Z. Fan and F. Harrigan (eds.), *From Growth to Convergence: Asia's Next Two Decades*, Asian Development Bank, Manila, 2007, December.
11. "The Economics of Climate Change in Agriculture," with D. Zilberman, X. Liu, and D. Sunding, in *Mitigation and Adaptation Strategies for Global Change*, Kluwer, 2004.
12. "Trade Integration, Environmental Degradation, and Public Health in Chile: Assessing the linkages," with John Beghin, Brad Bowland, S. Dessus, and Dominique van der Mensbrugghe, *Environment and Development Economics* 7 (2003): 45-71.

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15. "NAFTA and Industrial Pollution: Some General Equilibrium Estimates," with Kenneth A. Reinert, *Journal of Economic Integration*, 16(2), 2001.
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2. Regional Economic Development in Asia

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1. [*Economic Development and Cooperation in the Pacific Basin: Trade, Investment, and Environmental Issues*](#), with Hiro Lee, Cambridge: Cambridge University Press, 1998.

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3. "Regional Trade Opportunities for Asian Agriculture," with Shika Jha, Songsak Sriboonchitta, and Drew Behnke, in John Gilbert (ed.), *New Developments in Computable General Equilibrium Analysis for Trade Policy*, London: Emerald, pp. 273-302.
4. [*"Growth and structural change in China's energy economy,"*](#) with F. Kahrl, *Energy*, (2009), Forthcoming.
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4. [*"China's Real Exchange Rate and Implications for East Asian Regional Trade and Investment Flows,"*](#) in B. Fleisher, N. Hope, A. Pena, and D. Yang (eds.), *Policy Reform and Chinese Markets: Progress and challenges*, Elgar, 2008.
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39. "Industrial Organization and Trade Liberalization: Evidence from Korea," with J. de Melo, in R.E. Baldwin (ed.), *Empirical Studies of Commercial Policy*, Chicago: University of Chicago Press and NBER, 1992.
40. "Adjustment Under Uncertainty with Computable General Equilibrium Models: General Theory and an Application to Korea," with I. Adelman and A. Sarris, *International Economic Journal*, 4(2): 1-20, Summer 1990.

Research Conference Presentations:

1. "Trade and Asian Regional Integration," Conference on Economic Challenges in Asia, Stanford Institute of International Development, Palo Alto, May 31 - June 3, 2006.
2. "Empirical Methods for Integrating Regional and National Economic Policy Analysis," Development Research Center, State Council of the PRC, Beijing, March 27, 2006.
3. "New Horizons for Rural Reform in China: Resources, Property Rights, and Consumerism," with F. Kahrl and D. Zilberman, international conference on "China's Policy Reforms: Progress and Challenges," Stanford Center for International Development, Stanford University, September 29 – October 1, 2005, Palo Alto.
4. "Price Transmission and Poverty Alleviation: Local Effects of National Policies in Vietnam," presented at the *International Conference on Putting Development Back into the Doha Agenda: Poverty Impacts of a WTO Agreement*, 2-4 December 2004, The Hague.
5. "China's Emergence and Changing Patterns of: Trade, Employment, and Investment in East Asia," *International Forum on China's Development: Key Challenges for China's Sustained Growth*, 10–11 November 11, 2004, Seoul.
6. "China's Real Exchange Rate and Implications for East Asian Regional Trade and Investment Flows," presented at the *Third Annual Conference on China*

- Economic Policy Reform*, October 14-16, 2004, Stanford Center for International Development, Palo Alto.
7. "Chinese Economic Growth and Atmospheric Pollution: Challenges and Opportunity," with J. He, Seventh Annual *GTAP Conference on Global Trade Analysis*, 18 June 2004, World Bank, Washington.
 8. "East Asian Trade Relations in the Wake of China's WTO Accession," International Symposium on *China's Policy Reforms: Progress and Challenges*, Tsinghua University, Beijing, May 24-25, 2004, sponsored by the National Center for Economic Research, Tsinghua University, Beijing, PRC.
 9. "CGE Methods for Poverty Incidence Analysis: An Application to Vietnam's WTO Accession," Seventh Annual *GTAP Conference on Global Trade Analysis*, 18 June 2004, World Bank, Washington.
 10. "An Overview of China's Emergence and East Asian Trade Patterns," FACES Conference, 12 April 2004, Stanford University, Palo Alto.
 11. "East Asian Trade Relations in the Wake of China's WTO Accession," invited address at *Evolution of Trade and Foreign Direct Investment in the Asia-Pacific*, Dissemination Workshops for the Center for Global Partnership (CGP) Project, "China, Japan, and the United States: Emergent Trilateralism in the Pacific Economy," 23 May 2004, at the Development Research Center of the State Council of the PRC, Beijing, and 27 May 2004, at Japan Foundation Headquarters, Tokyo.
 12. "China's Emergence in a Regional Context: Projections to 2020," presented at the international conference on "New Regionalism in East Asia" organized by the Asia Pacific Economic Forum (APEF) and Keio University, 20 September 2003, Tokyo.
 13. "East Asian Regionalism: Implications of ASEAN+3 and other FTA Agreements," Asian Development Bank Institute, 19 September 2003, Tokyo.
 14. "Asian Trade Liberalization and U.S. Agriculture: Opportunities and Challenges," with D. Zilberman, presented at the *Conference on Emergent Trilateralism in the Pacific Basin*, 3 June 2003, U.C. Berkeley.
 15. "Future Prospects and Policy for Trilateral Trade among China, Japan, and the United States," with Hiro Lee, presented at the *Conference on Emergent Trilateralism in the Pacific Basin*, 3 June 2003, U.C. Berkeley.
 16. "Global Supply Networks and Multilateral Trade Linkages: A Structural Analysis of East Asia," Asian Development Bank Institute, 18 December 2002.
 17. "East Asian Patterns of Comparative Advantage," Asian Development Bank Institute, 29 August 2002, Tokyo.
 18. "An Overview of China's Emergence and East Asian Regional Trade to 2020," Asian Development Bank Institute, 22 July 2002, Tokyo.
 19. "Emergent Trilateralism in the Pacific Basin: How will Globalization Affect China's Trade with Japan, the United States and the Region?" paper presented at

- The Fifth Annual Conference on Global Economic Analysis, Taipei, June 2002, with Hiro Lee and Dominique van der Mensbrugghe.
20. "Trade and Transmission of Endogenous Growth Effects: Japanese Economic Reform as an Externality for East Asian Economies," with Hiro Lee, presented at the Third Annual Conference on Global Economic Analysis, Melbourne, Australia, June 2000.
 21. "Recovery and Transition for the Indonesian Economy," with I. Azis, paper presented to the Conference on Sustainable Development in India and Indonesia, United Nations University, Tokyo, May 2000.
 22. "On the Opportunity Cost of Japan's Recession to Its Trading Partners," with Hiro Lee, presented at the Workshop on Reform and Recovery in East Asia: The Role of APEC, Australian National University, Canberra, September 1999.
 23. "A Free Trade Area in the Asian Pacific?" with Hiro Lee, presented at the Conference on "Economic Integration: Aspects of Fiscal and Trade Policies," University of Tokyo, October 1995.
 24. "The Potential Impact of the Removal of Japanese Tariff and Nontariff Barriers on Japan-U.S. Trade Patterns," with Hiro Lee, presented at the Fifth International CGE Modeling Conference, Waterloo, Canada, October 1994.
 25. "International Trade and the Transfer of Environmental Costs and Benefits," with Hiro Lee, presented at the Annual Meetings of the American Economic Association, Boston, January 1994.
 26. "Modeling Chinese Growth and Trade from a General Equilibrium Perspective," with H. Lee and D. van der Mensbrugghe, presented to the Development Research Center of the State Council, People's Republic of China, Beijing, February, 1993.
 27. "Design and Implementation of a Regional Economic Database for Chinese Policy Analysis," presented to the Development Research Center of the State Council, People's Republic of China, Beijing, February 1993.
 28. "Trends in Comparative Advantage between the United States and Japan: Confluence of Interests or Potential for Conflict?" with Hiro Lee, presented to the Annual Meetings of the American Economic Association, Anaheim, January 1993.
 29. "Bilateral Trade Between the United States and Japan and the Implications of Agricultural Protection," with Hiro Lee, presented to the Second International CGE Modeling Conference, Waterloo, Canada, October 1991.
 30. "The Debt Problem, Stabilization and Structural Adjustment, and their Socioeconomic Impact: the Case of Indonesia," with E. Thorbecke, presented at the annual meetings of the American Economic Association, New York, December 1988.

Invited Presentations²

31. "Trade and Asian Regional Integration," Conference on Economic Challenges in Asia, Stanford Institute of International Development, Palo Alto, May 31 - June 3, 2006.
32. "Potential Gains from Integration of the Central Asian Republics," Asian Development Bank Trade Policy Coordinating Committee Workshop, Urumchi, April 7-10.
33. "Empirical Methods for Integrating Regional and National Economic Policy Analysis," Development Research Center, State Council of the PRC, Beijing, March 27, 2006.
34. "Strategic Economic Assessment of Avian Flu Control Measures," Faculty of Economics, Chulalongkorn University, Bangkok, March 21-22, 2006.
35. "China's Agricultural Development and Implications for California Agriculture," California Agribusiness Executive Seminar Monterey Plaza Hotel and Spa, Monterey, CA, March 5-7, 2006.
36. "A Giant Awakens: China's Global Economic Emergence and Implications for US Agriculture," Lecture presented to:
 - a. UC President's Advisory Commission on Agriculture and Natural Resources, April 7 2005, Berkeley.
 - b. Wells-Fargo National Agribusiness Finance Seminar, October 12, 2005, Las Vegas.
37. "Emergent Trilateralism in Developing Asia: Long Term Scenarios for Regional Growth and Trade," Lectures sponsored by the Asian Development Bank:
 - a. National Institute of Development Administration, Thailand, July 26, 2005, Bangkok.
 - b. Ministry of Finance of the PRC, July 22, 2005, Beijing.
 - c. Development Research Center, State Council of the PRC, July 21, 2005, Beijing.
 - d. Ministry of Finance, India, July 16, 2005, New Delhi.
 - e. Indira Gandhi Institute of Development Research, July 14, 2005, Mumbai.
38. "Economic Impacts of Reducing Trade Barriers in the Central Asian Republics," Ministry of Trade of Kazakhstan, June 7, 2005, Almaty.

² These represent only invited appearances where all expenses were covered by the sponsor.

39. Three Lectures on Reconciliation of Economic Accounts, Development Research Center, State Council of the PRC, June 4-5, 2005, Beijing:
 - a. "Micro and Macro Integration for Economic Policy Analysis"
 - b. "Reconciling China's Regional Input-Output Tables"
 - c. "Provincial Trade Flow Estimation for China"
40. "Trade and Growth Horizons for Asia," speech to the Annual Meeting of the Asian Development Bank, May 5, 2005, Istanbul.
41. "China's Emergence and Changing Patterns of: Trade, Employment, and Investment in East Asia," *International Forum on China's Development: Key Challenges for China's Sustained Growth*, 10–11 November 11, 2004, Seoul.
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43. "Leveraging China's Emergence for Vietnamese Economic Growth," invited address to the Ministry of Agriculture and Rural Development, 20 September 2004, Hanoi, Viet Nam.
44. "Tracing Policy Impacts to the Household Level in Viet Nam," Second Annual PPLPI Steering Committee Meeting, 23 June 2004, United Nations Food and Agriculture Organization, Rome, Italy.
45. "Economic Analysis of Rural Poverty and Vietnam's WTO Accession," invited address to the resident mission of the World Bank, January, 2004, Hanoi.
46. "Globalization and Agricultural Development in Vietnam: Economic Assessment of Bilateral Trade Agreements," invited address to the Ministry of Agriculture and Rural Development, 12 January 2004, Hanoi.
47. "East Asian Trade Relations in the Wake of China's WTO Accession," invited address at *Evolution of Trade and Foreign Direct Investment in the Asia-Pacific*, Dissemination Workshops for the Center for Global Partnership (CGP) Project, "China, Japan, and the United States: Emergent Trilateralism in the Pacific Economy," 23 May 2004, at the Development Research Center of the State Council of the PRC, Beijing, and 27 May 2004, at Japan Foundation Headquarters, Tokyo.
48. "East Asian Regionalism: Implications of ASEAN+3 and other FTA Agreements," Asian Development Bank Institute, 19 September 2003, Tokyo.
49. "Asian Trade Horizons for the Latin American Economies," address to the Inter-American Development Bank, 18 June 2004, Washington.

50. "WTO Accession and Domestic Reform: Vietnam's Trade Horizons to 2020," invited address to the Central Institute of Economic Management, 29 March 2004, Hanoi.
51. "Couching Dragon or Hidden Tiger? Threats or Opportunities from Open China," address to invited delegations and experts at the Resident Mission of the Asian Development Bank, 14 January 2003, Beijing.
52. "Vietnamese Agriculture and the WTO," invited address to the Ministry of Agriculture and Rural Development, 22 November 2002, Hanoi.
53. "Opportunities and Challenges from China's Global Emergence: East Asian Trade Horizons to 2020," Annual Meetings of the Asian Development Bank, 8 May 2002, Shanghai, PRC.
54. "China and the WTO: Perspectives to 2020" with Dominique van der Mensbrugghe (World Bank), presented at
 - a. Foreign Affairs Committee of the Chinese People's Consultative Conference, Beijing, January 2002;
 - b. Global Prospects Research Department of the World Bank, Washington, February 2002.
 - c. The Fifth Annual Conference on Global Economic Analysis, Taipei, June 2002.
 - d. Asian Development Bank Institute, Tokyo, July 2002.

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1. "[Industrial Food Animal Production and Global Health Risks: Exploring the Ecosystems and Economics of Avian Influenza](#)," with J. H. Leibler, J. Otte, D.U. Pfeiffer, R. Soares Magalhaes, J. Rushton, J.P. Graham, and E.K. Silbergeld, *EcoHealth*, (2009), 10.1007/s10393-009-0226-0.
2. "[Impacts of avian influenza virus on animal production in developing countries](#)," with J. Otte, J. Hinrichs, J. Rushton, and D. Zilberman, CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources 2008 3, No. 080.
3. "[Livestock and Livelihoods: Development goals and indicators applied to Senegal](#)," with J. Otte, *African Journal of Agricultural Research* Vol. 2(6), pp. XX-XXX, June, 2007.
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1. "Global Supply Networks and Multilateral Trade Linkages: A Structural Analysis of East Asia," Asian Development Bank Institute, 18 December 2002.
2. "New Perspectives on Aid Effectiveness," Annual Bank Conference on Development Economics, June 24-26, Oslo, Norway (ABCDE-Europe 2002), with F. Tarp.

Invited Presentations³

1. "Pro-Poor Livestock Policy in Four Archetype Developing Countries," UN Food and Agriculture Organization, Rome, June 21, 2006.
2. "Integrated Poverty Assessment for Livestock Policy," Ministry of Agriculture, Dakar, Senegal, May 8, 2006.

³ These represent only invited appearances where all expenses were covered by the sponsor.

3. "Strategic Economic Assessment of Avian Flu Control Measures," Faculty of Economics, Chulalongkorn University, Bangkok, March 21-22, 2006.
4. "China's Agricultural Development and Implications for California Agriculture," California Agribusiness Executive Seminar Monterey Plaza Hotel and Spa, Monterey, CA, March 5-7, 2006.
5. "A Giant Awakens: China's Global Economic Emergence and Implications for US Agriculture," Lecture presented to:
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 39. "Bilateral Trade Between the United States and Japan and the Implications of Agricultural Protection," with Hiro Lee, presented to the Second International CGE Modeling Conference, Waterloo, Canada, October 1991.
 40. "Demand Specification for Tradeable Goods: A Comparison of Estimates with Flexible Functional Forms," with K. Reinert and C. Shiells, presented at the Third Taskforce on Applied General Equilibrium Modeling, IIASA, Laxenburg, 1991.

41. "A General Equilibrium Approach to Spanish Trade and Industrial Policy," with F. Sancho, presented at the *VI Jornadas de Economia Industrial*, Madrid, September 1990.
42. "The Debt Problem, Stabilization and Structural Adjustment, and their Socioeconomic Impact: the Case of Indonesia," with E. Thorbecke, presented at the annual meetings of the American Economic Association, New York, December 1988.
43. "Parameter Choice for Computable General Equilibrium Models," presented at the N.B.E.R. Workshop on Applied General Equilibrium Modeling, Palo Alto, April 1988.
44. "The Opportunity Cost of Defense Spending," with S. Robinson and L.D. Tyson, presented at the annual meetings of the American Economic Association, December 1987.
45. "Modeling Structural Adjustment in the U.S. Economy," with S. Robinson, presented at the annual meetings of the American Economic Association, December 1986.
46. "Notes on Differential Applications of Computable General Equilibrium Models," presented to the Workshop on General Equilibrium Modeling, International Institute of Applied Systems Analysis, Vienna, August 1986.
47. "Distribution and Redistribution," presented to the Fifth World Congress of the Econometric Society, Cambridge, Massachusetts, August 1985.

Invited Presentations⁴

1. "Trade and Asian Regional Integration," Conference on Economic Challenges in Asia, Stanford Institute of International Development, Palo Alto, May 31 - June 3, 2006.
2. "Pro-Poor Livestock Policy in Four Archetype Developing Countries," UN Food and Agriculture Organization, Rome, June 21, 2006.
3. "Integrated Poverty Assessment for Livestock Policy," Ministry of Agriculture, Dakar, Senegal, May 8, 2006.
4. "Potential Gains from Integration of the Central Asian Republics," Asian Development Bank Trade Policy Coordinating Committee Workshop, Urumchi, April 7-10.

⁴ These represent only invited appearances where all expenses were covered by the sponsor.

5. "Empirical Methods for Integrating Regional and National Economic Policy Analysis," Development Research Center, State Council of the PRC, Beijing, March 27, 2006.
6. "Managing Greenhouse Gas Emissions in California: Preliminary Results from the BEAR Model," testimony before the California Environmental Protection Agency, Sacramento, February, 2006.
7. "A Giant Awakens: China's Global Economic Emergence and Implications for US Agriculture," Lecture presented to:
 - a. UC President's Advisory Commission on Agriculture and Natural Resources, April 7 2005, Berkeley.
 - b. Wells-Fargo National Agribusiness Finance Seminar, October 12, 2005, Las Vegas.
8. "Emergent Trilateralism in Developing Asia: Long Term Scenarios for Regional Growth and Trade," Lectures sponsored by the Asian Development Bank:
 - a. National Institute of Development Administration, Thailand, July 26, 2005, Bangkok.
 - b. Ministry of Finance of the PRC, July 22, 2005, Beijing.
 - c. Development Research Center, State Council of the PRC, July 21, 2005, Beijing.
 - d. Ministry of Finance, India, July 16, 2005, New Delhi.
 - e. Indira Gandhi Institute of Development Research, July 14, 2005, Mumbai.
9. "Economic Impacts of Reducing Trade Barriers in the Central Asian Republics," Ministry of Trade of Kazakhstan, June 7, 2005, Almaty.
10. Three Lectures on Reconciliation of Economic Accounts, Development Research Center, State Council of the PRC, June 4-5, 2005, Beijing:
 - a. "Micro and Macro Integration for Economic Policy Analysis"
 - b. "Reconciling China's Regional Input-Output Tables"
 - c. "Provincial Trade Flow Estimation for China"
 - d. "Trade and Growth Horizons for Asia," speech to the Annual Meeting of the Asian Development Bank, May 5, 2005, Istanbul.
11. "China's Emergence and Changing Patterns of: Trade, Employment, and Investment in East Asia," *International Forum on China's Development: Key Challenges for China's Sustained Growth*, 10–11 November 11, 2004, Seoul.

12. "Implications of Indian and Chinese Emergence for the Asian Regional Economies," address to the Research Department of the Asian Development Bank, 23 September 2004, Manila.
13. "Leveraging China's Emergence for Vietnamese Economic Growth," invited address to the Ministry of Agriculture and Rural Development, 20 September 2004, Hanoi, Viet Nam.
14. "Tracing Policy Impacts to the Household Level in Viet Nam," Second Annual PPLPI Steering Committee Meeting, 23 June 2004, United Nations Food and Agriculture Organization, Rome, Italy.
15. "Economic Analysis of Rural Poverty and Vietnam's WTO Accession," invited address to the resident mission of the World Bank, January, 2004, Hanoi.
16. "Globalization and Agricultural Development in Vietnam: Economic Assessment of Bilateral Trade Agreements," invited address to the Ministry of Agriculture and Rural Development, 12 January 2004, Hanoi.
17. "East Asian Trade Relations in the Wake of China's WTO Accession," invited address at *Evolution of Trade and Foreign Direct Investment in the Asia-Pacific*, Dissemination Workshops for the Center for Global Partnership (CGP) Project, "China, Japan, and the United States: Emergent Trilateralism in the Pacific Economy," 23 May 2004, at the Development Research Center of the State Council of the PRC, Beijing, and 27 May 2004, at Japan Foundation Headquarters, Tokyo.
18. "East Asian Regionalism: Implications of ASEAN+3 and other FTA Agreements," Asian Development Bank Institute, 19 September 2003, Tokyo.
19. "Asian Trade Horizons for the Latin American Economies," address to the Inter-American Development Bank, 18 June 2004, Washington.
20. "WTO Accession and Domestic Reform: Vietnam's Trade Horizons to 2020," invited address to the Central Institute of Economic Management, 29 March 2004, Hanoi.
21. "Couching Dragon or Hidden Tiger? Threats or Opportunities from Open China," address to invited delegations and experts at the Resident Mission of the Asian Development Bank, 14 January 2003, Beijing.
22. "Vietnamese Agriculture and the WTO," invited address to the Ministry of Agriculture and Rural Development, 22 November 2002, Hanoi.
23. "Opportunities and Challenges from China's Global Emergence: East Asian Trade Horizons to 2020," Annual Meetings of the Asian Development Bank, 8 May 2002, Shanghai, PRC.

24. “China and the WTO: Perspectives to 2020” with Dominique van der Mensbrugghe (World Bank), presented at
25. Foreign Affairs Committee of the Chinese People’s Consultative Conference, Beijing, January 2002;
26. Global Prospects Research Department of the World Bank, Washington, February 2002.
27. The Fifth Annual Conference on Global Economic Analysis, Taipei, June 2002.
28. Asian Development Bank Institute, Tokyo, July 2002.

Research Reports:

- E70. Kazybayeva S, Otte J, and D. Roland-Holst (2008). A Social Accounting Matrix for Cambodia 2004. 27pp
- E71. Sriboonchitta S, Otte J, and D Roland-Holst (2009). A Social Accounting Matrix for Thailand, 2006. 33pp
- E72. Hong Hanh PT, Nhan LT, Otte J, and D Roland-Holst (2009). A Social Accounting Matrix for Viet Nam, 2005. 53pp
- E73. Sriboonchitta S, Chaiwan A, Kahrl F, Heft-Neal S, Otte J, and D Roland-Holst (2010) Livestock Promotion for Market Oriented Rural Poverty Alleviation. 16pp
- E74. Behnke D, Otte J, and D Roland-Holst (2010). Micro Contracting and the Smallholder Poultry Supply Chain in Lao PDR
- E75. Changannakham P, Behnke D, Otte J, and D Roland-Holst (2010). Promoting
- E76. Fournie G, Metras R, Soares Magalhaes RJ, Hoang Dinh Q, Gilbert J, Dung DH, Roland-Holst D, Otte J, and D Pfeiffer (2009). Modelling the impact of vaccination on silent spread of HPAI H5N1 during the final stages of the small-holder production cycle in northern Viet Nam. Abstract and presentation at the 12th International Symposium on Veterinary Epidemiology & Economics (ISVEE), 10-14 August 2009, Durban, South Africa.
- E77. “Leveraging China’s Emergence For Viet Nam’s Economic Growth Opportunities And Challenges For Agriculture,” Report No. 5, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2005.
- E78. “Viet Nam’s Trade With the Republic of Korea: Longer-Term Prospects for Agriculture,” Report No. 4, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2005.
- E79. “Viet Nam’s Trade With Japan: Longer-Term Prospects for Agriculture,” Report No. 3, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2004.
- E80. “Viet Nam’s Trade With The European Union: Longer-Term Prospects for Agriculture,” Report No. 2, Research Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2004.
- E81. “Viet Nam’s Bilateral Trade Agreement With The United States: Economic Projections To 2020 And Implications For Agriculture,” Report No. 1, Research

- Papers on Globalization and Agricultural Development in Vietnam, Ministry of Agriculture and Rural Development, Ha Noi, 2003.
- E82. Household Income Determination in Vietnam: A Structural Analysis with Implications for Market Reform,” with Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 63pp, January, 2003.
- E83. “Economic Reform and Structural Price Transmission: Lessons from an Emerging Asian Economy,” with Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 56pp, January, 2003.
- E84. “A 2000 Social Accounting Matrix for Vietnam,” with John Rand and Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 102pp, June, 2002.
- E85. “A 1999 Social Accounting Matrix for Vietnam,” with John Rand and Finn Tarp, Research Monograph, Central Institute of Economic Management, Hanoi, 84pp, January, 2002.
- E86. “Japan’s Emerging Role in Economic Development and Cooperation in the Pacific Basin,” with H. Lee, M. Ezaki, and S. Urata, report prepared for the Japan Foundation Center for Global Partnership, 1995.
- E87. “Labor Market Structure and Trade Liberalization in Morocco,” with A.M. Maechler, paper prepared for the Country Economic Memorandum in Morocco, Washington: The World Bank, 1995.
- E88. “A General Equilibrium Modeling Facility for Morocco,” report prepared for the Moroccan Ministry of Trade, Rabat, 1995.
- E89. “User’s Manual for the Costa Rican General Equilibrium Model,” report prepared for MIDEPLAN Costa Rica and USAID, 1994.
- E90. “Estimates of Non-agricultural Trade Control Measures for Applied General Equilibrium Analysis,” report prepared for the OECD Development Centre, Paris, and the International Economics Division of the World Bank, Washington, August 1992.
- E91. “Tax Evasion and Tax Reform in a Low-Income Country: General Equilibrium Estimates for Madagascar,” with M. Haddad and J. de Melo, The World Bank, December 1990.
- E92. “Export Responsiveness in U.S. Mining and Manufacturing Industries,” with K. Reinert, U.S. International Trade Commission, Washington, D.C., June 1990 18pp.
- E93. “General Equilibrium Estimates of the Cost of U.S. Import Protection,” with K. Reinert, U.S. International Trade Commission, Washington, D.C., June 1990, 135pp.

- E94. "Social Accounting Matrices and Exogenous Parameter Estimates for U.S. Trade Policy Analysis," with K. Reinert, U.S. International Trade Commission, Washington, D.C., June 1990, 49pp.
- E95. "Stabilization and Structural Adjustment in Indonesia: An Intertemporal General Equilibrium Analysis," Technical Paper, OECD Development Centre, Paris, March 1992, 75pp.
- E96. "General Equilibrium Modeling for Trade Policy: An Overview," with S. Tokarick, USITC, Washington, November 1989, 65pp.
- E97. "A General Equilibrium Analysis of Domestic Resources, Competitiveness, and Trade Policy in Ecuador," with E. Sadoulet, prepared for the Latin America Division of the World Bank, Washington, March 1989, 105pp.

Unpublished Working Papers:

- F2. "Asia's Long Term Growth and Integration: Reaching beyond Trade Policy Barriers," with Douglas Brooks and Fan Zhai, Policy Brief No. 38, Economic Research Department, Asian Development Bank, Manila, 2005.
- F25. "Behavioral and Empirical Perspectives on FDI: International Capital Allocation across the Asian Region," with Douglas Brooks and Fan Zhai, Discussion Paper, Economic Research Department, Asian Development Bank, Manila, 2005.
- F26. "Growth and Trade Horizons for Asia: Long-term Forecasts for Regional Integration," with Jean-Pierre Verbiest and Fan Zhai, *Asian Development Review*, Vol. 22, No. 2, 2005.
- F27. "East and Southeast Asian Trade Relations in the Wake of China's WTO Accession," Working Paper, Sanford Center for International Development, Palo Alto <http://scid.stanford.edu/pdf/scid206.pdf> , 2004.
- F28. "Regionalism and Globalism in East and Southeast Asia," with I. Azis, L. Liu, and D. van der Mensbrugghe, Discussion Paper, Asian Development Bank Institute, Tokyo, 2003.
- F29. "East Asian Patterns of Comparative Advantage," Discussion Paper, Asian Development Bank Institute, Tokyo, 2003.
- F30. "Global Supply Networks and Multilateral Trade Linkages: A Structural Analysis of East Asia," Discussion Paper, Asian Development Bank Institute, Tokyo, 2003.
- F31. "How Will Agricultural Trade Reforms in High-income Countries Affect the Trading Relationships of Developing Countries?" with Beghin, John C. and Dominique van der Mensbrugghe, Staff Research Paper 10665, Department of Economics, Iowa State University, 2003.

- F32. "Emergence of China and the implications for regional trade initiatives in the Asian Pacific," with Hiro Lee and Dominique van der Mensbrugghe, Working Paper No. 2002-27, Kitakyushu: International Center for Economic Research, Tokyo, 2002.
- F33. "Global Agricultural trade and the Doha Round: What are the implications of North and South?" with Beghin, John C. and Dominique van der Mensbrugghe, Working Paper 02-WP 308, Staff Research Paper 10665, Department of Economics, Iowa State University, 2002.
- F34. "An Overview of China's Emergence and East Asian Trade Patterns to 2020," Discussion Paper No. 44, Asian Development Bank Institute, Tokyo, 2002.
- F35. "China and the WTO: Beginning of the End for Asian Regionalism?" with Dominique van der Mensbrugghe, processed, January, 2002.
- F36. "Trade and Income Growth in Vietnam: Estimates from a New Social Accounting Matrix," with Finn Tarp and John Rand, Discussion Paper DP0201, Central Institute of Economic Management, Hanoi, and Nordic Institute of Asian Studies, Copenhagen, 2002.
- F37. "Rural-urban Dualism in Vietnam: Prospects for Redistribution Through Economic Reform," with Finn Tarp, Discussion Paper DP0202, Central Institute of Economic Management, Hanoi, and Nordic Institute of Asian Studies, Copenhagen, 2002.
- F38. "Economic Structure and Development in an Emergent Asian Economy: Evidence from a Social Accounting Matrix for Vietnam," with Finn Tarp and John Rand, Discussion Paper DP0203, Central Institute of Economic Management, Hanoi, and Nordic Institute of Asian Studies, Copenhagen, 2002.
- F39. "General Equilibrium Assessments of Trade Liberalization in APEC Countries," with H. Lee and D. van der Mensbrugghe, Discussion Paper Series No. 103, Research Institute for Economics and Business Administration, Kobe University, July 1999.
- F40. "APEC Trade Liberalization and Structural Adjustments: Policy Assessments," with H. Lee and D. van der Mensbrugghe, APEC Discussion Paper Series No. 11, APEC Study Center, Nagoya University and the Institute of Developing Economies, March 1997.
- F41. "Labor Markets, Trade Reform, and Structural Adjustment in Small Open Economies," with A.M. Maechler, Technical Paper No. 110, OECD Development Centre, Paris: OECD, 1995.
- F42. "Input-based Pollution Estimates for Environmental Assessment in Developing Countries," with J. Beghin, S. Dessus, and D. van der Mensbrugghe, Technical Paper No. 101, OECD Development Centre, Paris, October 1994.

- F43. "Trade and Pollution Linkages: Piecemeal Reform and Optimal Intervention," with J. Beghin and D. van der Mensbrugghe, Technical Paper No. 99, OECD Development Centre, Paris, October 1994.
- F44. "International Trade and the Transfer of Environmental Costs and Benefits," with Hiro Lee, Technical Paper No. 91, OECD Development Centre, Paris, December 1993.
- F45. "A Detailed Input-output Table for Morocco, 1990," with M. Bussolo, Technical Paper No. 90, OECD Development Centre, Paris, November 1993.
- F46. "Trends in Comparative Advantage between the United States and Japan: Conflict or Confluence of Interests?" with Hiro Lee, Working Paper, Institute of International Studies, University of California, Berkeley, January 1993.
- F47. "Matrix Methods of Enterprise Accounting," Working Paper, Department of Economics, Mills College, November 1991.
- F48. "Export Earnings, Government Expenditure, and Household Incomes in Indonesia," Working Paper, Department of Economics, Mills College, September 1988.