Decision Support for National Development Strategies and Policy Dialog in the CAREC Region

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Central Asia’s Economic Opportunities: Economic Corridors and Global Value Chains
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Overview

Regional economic integration is accelerating in Central Asia, significantly because of determined national and international commitments to infrastructure and other investments.

This has been complemented by substantial progress on the institutional side, promoting a more open multilateral trade and investment environment.

In a rapidly evolving regional economy, however, decision makers need support for more evidence-based strategic planning and engagement.

This project develops a new generation of decision tools for economic assessment and policy dialog, nationally, regionally, and with international development partners.
Information Sharing

At our last ADB meeting on this subject, an expert group proposed a four-part information services strategy:

1. Host an online data portal covering trade, infrastructure, and related economic activity.
2. Develop indicators related to trade, corridors, and infrastructure generally.
3. Develop decision tools that make effective use of the first two resources.
4. Disseminate these data, indicators, and decision tools across the regional policy community, with emphasis on capacity building.
Monitoring: Indicators and Metrics

System performance - how effective are regional commitments/investments?

- Public Agency: Metrics and indicators
  - Trade Facilitation
  - Infrastructure and logistics performance
- Private Agency: Investment climate, standards and indicators

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Impact Evaluation

How are economic activities and livelihoods changed by regional integration?

- Need to capture heterogeneity and net benefits across diverse stakeholder groups
- Beyond macro aggregates - Explicitly spatial and more detailed
- Beyond point estimates - Need to recognize and estimate the role of risk and uncertainty
Example 1: Pakistan Northern Corridor
Household Total Real Income Growth
Cumulative Over Baseline, 2006-2030

Punjab has more transport-intensive agricultural products.

For the Urban Non-poor, income and expenditure effects combine to confer transport benefits.
Household Income Growth as a Percent of 2006 Income

The project is generally pro-poor, with small and landless rural farm households gaining more than Non-poor Non-farm and Urbanites.

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Example 2: Kazakhstan Corridor
The main beneficiaries in relative growth terms are Kazakhstan and proximate economies. Regional spillovers are quite significant.
Sectoral benefits are relatively uniform for local economies, more varied for trading partners.
Nominal gains are much more varied, depending on initial scale and trade shares.
How evidence-based forecasting can help policy

- Ex ante perspective: look before you leap
- Identify/quantify real impacts: - how much and for whom?
  - Reduced costs (TTT, VOC, time, etc.)
  - Expanded investment horizons
  - Larger markets
- Transport vs. Development – capture integrated, indirect, and longer term impacts
- Second-generation infrastructure – find the next level
- Adjustment assistance
  - Identify adjustment needs before they lead to problems
- Support dialog
  - Public: local, national, regional coherence/coordination
  - Private: arouse private stakeholders to complete the Commitment Game
CARGO: Central Asian Policy Simulation Model

- The basic architecture of this regional modeling facility is based on a global prototype designed at the University of California, Berkeley.

- This combines a multi-country Computable General Equilibrium (CGE) forecasting model with an interactive, user-friendly, browser-based “dashboard” for decision makers.

- These tools are designed to be implemented on local computers/tablets with a browser interface.
Basic CARGO Ingredients

Like all good economic policy, CARGO stands on two legs, highest quality data and analytical methods:

- **Data**: A country-by-country, integrated database for assessing economic linkages, policy and market outcomes, energy flows, and environmental impacts
  - Calibrated to GTAP-8, plus estimated Social Accounting Matrices for other CAREC economies
  - Up to 57 sectors/commodities
  - Annual projections to 2050

- **Model**: A state-of-the-art, economic scenario forecasting tool – downscaled from a global CGE developed at UC Berkeley
Regional Modeling Capacity

- A new CAREC regional model has been developed as part of TA-8259, Assisting The Central Asia Regional Economic Cooperation Institute Knowledge Program.
- The most advanced, up-to-date, and detailed model of its kind.
- The current version has 19 countries/regions, up to 57 sectors.
- Could be decomposed into individual member country models (e.g. TA-8259, Phase II).
- Results communication takes two forms:
  - Traditional technical reporting
  - A user-friendly data/results browsing app for dissemination to decision makers.

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# Central Asian Regional General equilibrium mOdel (CARGO)

<table>
<thead>
<tr>
<th>Countries/Regions</th>
<th>Sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Afghanistan</td>
<td>1 Crops</td>
</tr>
<tr>
<td>2 Azerbaijan</td>
<td>2 Livestock and Fishery</td>
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<tr>
<td>3 Kazakhstan</td>
<td>3 Coal</td>
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<td>4 Kyrgyzstan</td>
<td>4 Oil</td>
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<td>5 Mongolia</td>
<td>5 Gas</td>
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<td>6 Pakistan</td>
<td>6 Processed Food</td>
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<tr>
<td>7 Xinjiang/PRC</td>
<td>7 Textiles and Apparel</td>
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<tr>
<td>8 Tajikistan</td>
<td>8 Light Manufacturing</td>
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<tr>
<td>9 Turkmenistan</td>
<td>9 Heavy Manufacturing</td>
</tr>
<tr>
<td>10 Uzbekistan</td>
<td>10 Transport</td>
</tr>
<tr>
<td>11 Rest of PRC</td>
<td>11 Services</td>
</tr>
<tr>
<td>12 Russian Federation</td>
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<td>13 India</td>
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<td>14 High Income Asia</td>
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<tr>
<td>15 Rest of Asia</td>
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<td>16 EU</td>
<td></td>
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<tr>
<td>17 United States</td>
<td></td>
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<tr>
<td>18 Other Americas</td>
<td></td>
</tr>
<tr>
<td>19 Rest of World</td>
<td></td>
</tr>
</tbody>
</table>

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The CARGO model has been developed in four components:

1. Core Economic model
2. Transport module
3. Energy production/distribution
4. Emissions module
Detailed CARGO Framework

- Data
- Results
- Policy Intervention

Global GE Model

- Use Data
- Engineering Estimates
- Infrastructure Data

Transport

- Investment
- TT Policies

Energy

- IEA Energy Balances
- Elect Generation Data
- Engineering Estimates

Emissions

- Detailed State Output, Trade, Employment, Income, Consumption, Govt. Balance Sheets

Prices
- Demand
- Sectoral Outputs
- Resource Use

Innovation:
- Production
- Consumer Demand

Detailed Emissions of C02 and non-C02

Energy Regulation
- Oil Market

Efficiency incentives
- Emissions standards

Detailed Emission Database

National and International Initial Conditions, Trends, and External Shocks

Trade promotion
- Financial and labor reform
- Industrial Policies

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CARGO System Architecture

Regional Model

National Models

Graphic User Interface

ADB

CAREC

Afghanistan

Xinjiang

National Capitals

Policy Makers
Sample Model Inputs: CAREC Modeling Scenarios

**Transport and Infrastructure Policies**
Regional corridor schemes for national, regional, and global perspectives
Regional implications of national investments
Motorization and urbanization

**Trade Facilitation and Trade Policies**
Asian regional integration – national, regional, and global implications
Bilateral and regional TT measures
Integrated Trade Facilitation

**Energy Policies**
Strategy for Regional Cooperation in the Energy Sector
Energy Action Plan Framework
Regional energy security
Sample Model Outputs: What we forecast

<table>
<thead>
<tr>
<th>Category</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Structure</td>
<td>Sectoral output, demand, imports, and exports for each country.</td>
</tr>
<tr>
<td>Income</td>
<td>Total and per capita GDP by region \nValue added and employment by sector and country \nHousehold income by household category</td>
</tr>
<tr>
<td>Employment</td>
<td>Total employment by sector and country \nEmployment rates by household category</td>
</tr>
<tr>
<td>Energy</td>
<td>Total energy use by sector and country \nEnergy trade, production and usage mix by country \nEnergy use by household type</td>
</tr>
<tr>
<td>Emissions</td>
<td>GHG emissions (CO$_2$, CH$_4$, N$_2$O) by source, use, and region</td>
</tr>
</tbody>
</table>
Extensions

1. Regional assessment of trade and investment potential.
4. Dynamics of regional growth and poverty reduction.
5. Policy impacts on development indicators, MDG’s, etc.
6. Trends in urbanization and rural development.
7. Resource development, public investment, and fiscal impacts.
8. Demographic assessment, including migration, labor force development and employment patterns, and other socioeconomic trends.
Sample CARGO Map 1: CAREC Corridor Shipments by Country and Commodity

Pie charts show monitored carriage (weight*distance) by commodity class. Diameters are proportional to total national monitored carriage.
Sample CARGO Map 2: Kazakhstan - Oblast GRP and Income per Capita
The Policy Dashboard

➢ CARGO represents a new generation of policy simulation models, combining
  – Detailed structural data
  – State-of-the-art forecasting model

➢ The Policy Dashboard is a user-friendly, graphic interface that allows visualization of policy impacts.
Demonstration

- Now we switch to a browser.
Thank you