

ADB Working Paper Series on Regional Economic Integration



Can Global Value Chains Effectively Serve Regional Economic Development in Asia?

Hans-Peter Brunner

No. 110 | March 2013



ADB Working Paper Series on Regional Economic Integration

Can Global Value Chains Effectively Serve Regional Economic Development in Asia?

Hans-Peter Brunner*
No. 110 | March 2013

This paper summarizes some results as presented in Aid for Trade—An Investment Benefit Roadmap from South Asia. Manila: ADB. Forthcoming. (Team leader Hans-Peter Brunner, in conjunction with Global Development Solutions LLC. and Applied Agents, and funded by the Investment Climate Facilitation Fund under the Regional Cooperation and Integration Financing Partnership Facility established by the Government of Japan).

*Senior Economist, Office of Regional Economic Integration, Asian Development Bank, 6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines. hbrunner@adb.org

The ADB Working Paper Series on Regional Economic Integration focuses on topics relating to regional cooperation and integration in the areas of infrastructure and software, trade and investment, money and finance, and regional public goods. The Series is a quick-disseminating, informal publication that seeks to provide information, generate discussion, and elicit comments. Working papers published under this Series may subsequently be published elsewhere.

Disclaimer:

The views expressed in this paper are those of the author and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

ADB does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use.

By making any designation of or reference to a particular territory or geographic area, or by using the term "country" in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

Unless otherwise noted, \$ refers to US dollars.

Contents

Abstract	iv
1. Introduction	1
2. Development of Product-Specific GVCs	3
2.1 Indian Bamboo Floor Tiles: A GVC Analysis	4
2.2 Ceramic Table Ware in Bangladesh: A GVC Analysis	5
3. A Geographic Agent-Based Model with Built-in Feedback among Economic Tiles	8
4. Investment Scenarios	9
5. Concluding Remarks	9
References	11
ADB Working Paper Series on Regional Economic Integration	18
Figures	
1. Regional Economic Integration Feedback	12
2. Preliminary Business Plan Scenario: GVC Interventions in Bamboo Floor	13
3. GVC Interventions Bangladesh Ceramic Tableware	14
4. GVC Tracing for Bamboo Floor Tiling and Sea Buckthorn Plants	15
5. District Income Growth above Baseline from Full GVC Investment Package	15
Tables	
1. An Example of a Value Chain for Coffee	16
2. Raw Material Imports from India–Transaction Costs, 2009	16
3. Plaster of Paris Imports from Thailand–Transaction Costs, 2009	17
4. Summary of Barriers to Competitiveness in Bangladesh	17

Abstract

Regional economic integration through logistics, information network and connectivity improvement can increase the 'virtual size' of an economy as trade with neighboring countries increases. This leads to substantial benefits from scale, network, coordination and agglomeration economies. As is shown, especially in small economies and LDCs, regional economic integration induces the necessary rebalancing needed for integration of the regional portions of Global Value Chains (GVCs) to the global portions of GVCs. This paper demonstrates this with South Asian case studies in GVC development and with the related mapping methodology. This methodology traces a product through an entire channel across a region, from the point of product conception to the point of consumption. As an appropriate set of investment and policy measures is undertaken across a region, it can as we show in the paper, lead to a substantially 'rebalanced' way of income growth.

Keywords: Rebalancing, spatial distribution of growth, regional economic integration, South Asia, value chains

JEL Classification: C15, F12, F15, O18, R12

1. Introduction

This short paper features South Asian case studies in a Global Value Chain (GVC) development and related-mapping methodology, which is a process of tracing a product flow through an entire channel across a region, from the point of product conception to the point of consumption. This process highlights the underlying patterns of inputs, constraints, and competitive advantages that a producer has. It also traces the path of all value-adding and non-value-adding activities associated with the production of a good and approximates the costs involved at each stage.

Transaction productivity is low in poor and small economies that are remote from key markets. The high cost of market access makes integration into GVCs difficult, lowering incomes and growth. Regional integration through logistics, information network, and connectivity improvements can increase the “virtual” size of an economy as trade with neighboring countries increases. This leads to substantial benefits from scale, network, and agglomeration economies (Winters 2009). Further, this leads to a rise of unit values in exports, and thus to increased income and gross domestic product (GDP) growth. As export unit values increase, the cost of transportation per weight unit decreases relative to its value.

High quality products are also highly networked (Kali and Reyes 2007) as they come with many additional features; that is, these are complex goods that require equally complex GVCs. With the lowering of transport and transaction costs due to technological advances in the transport and communications sectors, and due to infrastructure investment, GVCs have increasingly evolved geographically. Conversely, studies have shown that inadequate infrastructure impedes horizontal diversification as market access remains difficult and the costs of exploring new markets stay high (Cadot et al. 2008). For regions and countries that produce lower quality goods, structural change entails moving into product components (and services) that are incorporated into higher quality products in sectors with high vertical product differentiation. However, such a move is only possible if entry into GVCs is easy and can occur with low transport and transaction costs. Thus, structural change also means the integration of GVCs in the region and the linkage of the regional part of GVCs to the global portion(s) of GVCs.

Harding (2009) is the only study linking integration in a geographic space through improved connectivity of infrastructure to increased export unit values from improved quality of existing products (vertical integration), or in terms of moving horizontally into new products. Harding uses changes in transaction costs due to reforms and investment in 10 Eastern European counties to evaluate the impact on export unit values at the 4-digit product level. The study finds that reform of and investment in the financial, communications, power, and road infrastructure sectors significantly increase export unit values. An additional interesting finding in the Harding study is that roads matter more for vertically differentiated products than for other products.

If an appropriate set of investment measures is undertaken across a region, it can, as shown in this paper, lead to substantially rebalanced growth in terms of income brackets and geography. Regional economic integration, when combined with measures to help

economies move into higher centrality in a product space¹ and when seen and examined through the prism of a stylized growth feedback model, is a very effective and powerful driver of a regional economy. Efforts to raise productivities, including transaction productivities in trade, with the levers of network, agglomeration, and scale economies, are likely to substantially propel economic growth upward.

To address the perceived trade account deficit, especially among the smaller, less developed countries (LDCs) of South Asia, it is necessary to upgrade and diversify the supply and sector structures in these economies. This is tantamount to both diversifying and integrating within a product group, but also to branching out into nearby product groups in the global product space. The GVC development and mapping methodology can facilitate investment in such rebalancing efforts.

A feedback cycle (Figure 1) of structural change needs detailed scrutiny. Structural change is about the establishment of economic measures and conditions that allow movement into those areas of product space in which firms can exploit markets through product differentiation at the high quality and price spectrum. This change is reliant on productivity growth. Such movement in product space can occur in developing economies through integration into GVCs that are anchored to a lead firm that ultimately assembles a vertically integrated and differentiated product at the high quality and price spectrum in a high income consumer market. I refer this strategy leading to structural change in product space as the vertical transformation of product space.

Another facet of a response strategy to the challenge of regional economic integration is for economies to diversify horizontally within the product space—an increase in the variety of trade. Diversification in product space leads to increased opportunities for growth, less vulnerability to economic disruptions (Baccetta et al. 2009), and is shown to increase average unit values in exports and, hence, induce positive feedback in the growth model (Feenstra and Kee 2004).

When model representations of change are used that are not inclusive of these powerful levers, then policy- and decision-makers are not sufficiently incentivized to induce structural change in product and geographic space; the large, potential gains from action are not made visible. The economic geography strongly determines the productivity, wage, and trade cost structure of heterogeneous firms embedded in networks, and this reality has to be represented effectively in models. This paper argues that there exist conceptual representations of change and rebalancing in economic structure that, while being sufficiently simple to be understood, remain sufficiently representative of reality and therefore yield significant added power to impact regional economic development in South Asia when compared to other less useful or crude representations.

This paper proceeds as follows. The next section illustrates the development of specific product case studies, as representatives of product groups located in product space. In the third section, a specific model representation is summarized that follows the frame of the stylized growth feedback as presented in Figure 1. It effectively and visually shows

¹ There is an extensive recent literature on the nature of product space. See Hausmann et al. (2008) and Felipe et al. (2012).

the rebalancing nature of GVC restructuring on a regional basis. The last section concludes.

2. Development of Product-Specific GVCs (Based on Case Studies)

Creating a GVC requires products to be defined and categorized according to various production processes and procedures that capture all value-adding and non-value-adding activities associated with a final product. Depending on the complexity of the product and the level of detail required for an analysis, the number of categories of activity along a value chain can range from as few as five to as many as 25 or more. For example, a value chain for coffee has nine process categories clustered under three major value-adding activities: land preparation, fertilizing, and plant maintenance. A sample of the process segmentation along a coffee value chain is presented in Table 1.

Each of the process segmentations represents important value adding and non-value-adding activities, relevant for tracing a product from its very beginning until it reaches the final consumer.

The selection of a specific product group for analysis is an important aspect of a successful GVC analysis. The reason is simply that the product chosen is really a proxy for the entire sector. Although the results for different products within a product cluster will often vary, experience suggests that the policy, legal, and market distortions a product cluster faces and the impact these distortions have on the competitiveness of players along the GVC vary only marginally. Therefore, the final value chain analysis will look very similar for major products across the spectrum of a product cluster.

When undertaking the scoping mission, the team looks at a number of factors related to the selection of the product and product clusters in order to confirm that the product and product clusters are the ones that should be analyzed. In confirming the product and product clusters, the following issues are taken into consideration.

- (i) An initial, rapid global market analysis is undertaken at the start of the scoping mission to determine the product and product cluster's position in the product space.
- (ii) It is important to understand whether or not the general demand for the product is growing and why. For instance, in the case of bamboo, the global demand is increasing due to the "green" nature of bamboo, while the supply capability is also increasing.
- (iii) The cost and availability of transportation is one of the major cost items in a GVC. This can relate to the transport of goods from farm (or factory) to port, and to the cost of bringing imported inputs from the port to the farm (or factory). In the case of northeast India, where infrastructure is spotty at best, the costs can be extraordinarily high. The costs and trouble of accessing imported inputs (e.g., specialized fertilizers) for a number of product and product clusters is high, resulting in a higher cost basis for landlocked areas.

- (iv) Although labor costs (and labor-related issues) are usually a minor part of the overall value chain, for products that require significant labor inputs, problems usually rest with labor productivity. The problem is not so much one based on individual output, but one that is more related to absenteeism, idle labor, and other productivity distortions resulting from deficient labor laws.

2.1 Indian Bamboo Floor Tiles: A GVC Analysis

Bamboo is a fast-growing grass that occurs naturally on every major continent except Europe. India is uniquely endowed, yielding a large and diverse resource of raw material. Of the nearly 1,200 species of bamboo in the world, India is home to 130 species, belonging to 18 genera. Although most are indigenous to the country, some have been brought to India from other countries.

Bamboo cultivation in India can draw upon a legacy of traditional skills and usage. The country's bamboo resources are the second largest in the world. Most varieties grow naturally at elevations ranging from sea level to more than 3,000 meters, and they do so in an extraordinary range of habitats on almost 10 million hectares—on forested land, on small family farms, and in private and government plantations.

For the purpose of this analysis, a GVC for export-quality bamboo parquet floor tiles was prepared. Although the product analyzed is categorized as export quality, the producers also sold the product domestically to builders and homeowners.

The value chain for export-quality bamboo parquet floor tiles can be divided into at least six levels of value-adding activities:

- (i) Sourcing the raw material;
- (ii) Cross-cutting and treatment;
- (iii) Drying;
- (iv) Planning and sorting;
- (v) Cutting and sizing; and
- (vi) Finishing and packing.

Key identified GVC barriers were the lack of commercial plantations able to apply scientific practices, a weak supply chain of bamboo raw material inputs into tile production, and a high level of waste of raw material due to outdated production technologies. Further weaknesses were inadequate quality control, testing, and certification of tile exports, and rent-seeking along the GVC, which added significantly to import and export transaction costs. Investment capital shortages and inadequate market access also hamper the export of bamboo floor tiles.

Based on the analysis of the market size for bamboo flooring (estimated at close to \$300 million over the next 10 years) and the potential of the northeastern region in India, it has been estimated that the region can capture around 10% of the global bamboo flooring market in the next 10 years, which translates to around 2 million square meters (m²) of floor tiles priced at around \$16–\$20 per m².

The GVC projects considered for investment fall into two categories:

- (i) Bamboo value-chain-specific projects such as commercial plantations and strip-making units. These projects are specific to one value chain and are funded as private investments under a trade finance facility component. We assume that many value chains—such as organic pineapples and other fruits and vegetables—will develop in parallel in the northeast of India and would require similar investments.
- (ii) Common infrastructure. This includes items such as inland container depots and trade facilitation centers, which would be utilized by various value chains, developed under a sovereign loan component, and suitably leverage resources through public private partnerships.

2.2 Ceramic Table Ware in Bangladesh: A GVC Analysis

The ceramics manufacturing industry in Bangladesh started in the 1960s with the establishment of the first porcelain tableware production plant. By the mid-1970s, the country also had a sanitary ware production firm. By 1991, the country exported approximately only \$1 million of ceramics ware, as the bulk of the production was destined for the local market. It was not until the late 1990s that the sector began to show significant export growth and contribute to employment. By 2008, some 40 years after its inception, ceramics manufacturing had emerged as a viable industry in Bangladesh.

Notwithstanding the fact that it remains focused solely on household applications and has not developed products for the increasingly important industrial ceramics market, the sector provides jobs for over 13,000 people and generates \$35 million–\$45 million in export revenues annually.

The Bangladeshi ceramics industry can generally be divided into two categories:

- (i) The tableware industry, which focuses mostly on the export market; and
- (ii) The tiles and sanitary ware industry, which focuses almost exclusively on the local market.

The export prospects and the competitiveness of the ceramics tableware industry are challenged by a range of public sector failures, which are examined in detail in the GVC analysis that follows.

For the purpose of this paper, a GVC analysis for export-quality Bangladesh ceramics, especially tableware, was prepared. Broadly, ceramics denote the manufacture of any product made from a non-metallic mineral hardened at high temperatures, including glass, earthenware, porcelain, and white-ware (non-decorated tableware). Ceramics also denote porcelain enamels, brick tiles and terracotta, refractories, cement, lime and gypsum, and certain abrasives.

Household ceramic applications generally fall within the definition of pottery, with applications in tableware and kitchenware, sanitary ware (sinks and toilets), and tiles. The focus of this GVC analysis is tableware made of porcelain.

The value chain for decorated porcelain tableware can be divided into eight key value-adding activities:

- (i) Raw material intake, inspection, and mixture preparation;
- (ii) Molding or casting, depending on tableware product;
- (iii) Biscuit drying and firing;
- (iv) Glazing and gloss firing;
- (v) Decorating and firing (decorating may not be performed, depending on tableware, in which case ceramics are moved from gloss kiln to finishing and packing);
- (vi) Finishing and packing;
- (vii) Transport to market; and
- (viii) Administration and overhead.

Typically, the process starts with the intake of imported raw materials that are inspected at the stone yard and moved to the mixture preparation stages of production.² The primary materials for ceramic products are white clay and sand. The largest deposit of white clay in Bangladesh was discovered in 1957 in Bijoypur (of Mymensingh). The total reserve of white clay from this region is estimated to be 2.57 million tons. Clay was also found at different locations in Jaflong (of Sylhet), but there is no clay or sand treatment plant at these locations. This is why about 95% of raw materials for making quality and exportable ceramic products in Bangladesh are imported from abroad, mainly from the People's Republic of China (PRC), India, Japan, Germany, New Zealand, Republic of Korea, and Thailand.

The inspected raw material mixtures are put in molds or casts, depending on specifications provided by the customer. After quality control inspections, the ceramic pieces are placed on a conveyor belt that directs the pieces into a dryer. Following the drying period, the ceramic pieces are placed on yet another conveyor belt leading to a finishing machine where edges and surface are smoothed out. The ceramic pieces are then ready for “biscuit” firing in a kiln.

Once the pieces, which are referred to as “biscuit ware,” have been glazed, they must be fired again, which is commonly referred to as gloss firing. Depending on specifications provided by the customer, the fired-glazed biscuit ware may end up directly in the finishing department or be channeled to a decorating unit where decorations and/or artwork such as paintings and decals are introduced—after which they are fired again.

Once cleaning, polishing, and inspections are completed, the finished porcelain is sent to the packing department where export products are packaged and loaded onto trucks for shipments via Chittagong Port.

² Mixture preparation is considered one of the key elements of pottery making and is generally guarded with the highest degree of secrecy among producers.

According to the GVC analysis, key constraints include political instability, unreliable gas pressure from public utilities, and import and export transportation costs.

Notwithstanding its low price, the quality of the gas supply is reported by some observers of the industry as a significant bottleneck. Due to high demand and poor infrastructure, gas pressure in the pipeline is extremely volatile. According to interviews, most tableware exporters are lucky enough to have plants in areas around Dhaka, where gas pressure is steady most of the time; but gas pressure remains volatile to a degree and all factories retain costly industrial back-up generators.

At any given time on the factory floor, multiple kilns run simultaneously firing biscuit, gloss, and decorations. Unlike printing presses that are powered by generators that can be turned on and off at any time, decoration, biscuit, and gloss firing kilns need to run constantly during production cycles. They also cannot be shut down quickly and need to cool off gradually (by loading empty carts) until pressure levels return to normal. As a result, major losses are incurred in the short-term (wasted materials) and long-term (rapid kiln and cart amortization). Improvements in the gas distribution network are therefore anticipated to improve the competitiveness of the industry.

A closer look at transportation costs suggest that importing raw materials via land (from India) or sea (from other Asian countries) is hindered by significant transaction and handling costs. When raw materials are imported from neighboring India via overland freight, transportation and handling charges increase the raw material prices by an average of 17%. Since India and Bangladesh do not have transit arrangements, Indian shipments must be offloaded and then reloaded onto Bangladeshi trucks at crossing points such as Benapol. This inefficiency increases the price of raw materials—freight on board (FOB) at the border crossing—by an average of 7%, which is nearly the same additional cost required for overland transport from the border to Dhaka (approximately 300 km) (Table 2).

When raw materials are imported from Southeast Asian and other countries via sea freight, supply chain inefficiencies still exist, but they revolve around under-handling rather than over-handling. Table 3 illustrates a cost and freight (C&F) bill for a shipment of plaster of Paris from Thailand via Chittagong Port. It can be seen that this particular shipment was stuck at the port for 39 days. At the time of shipment, a 5-day holiday was in effect, which resulted in backlogs and clearance and processing delays. The port charges associated with these delays cost firms an estimated \$38 per ton—a full quarter of all costs associated with moving a TEU from Chittagong to Dhaka.³ Importers admit that delays of this magnitude occur less frequently than in the past and now only occur a few times every year, but shorter delays of a few days are still pervasive and Chittagong Port's operations continue to disrupt firm supply chains. Table 4 highlights additional GVC barriers in Bangladesh. The interventions identified for Bangladesh are presented in Figure 3.

³ Twenty-foot equivalent unit (TEU) is the standard unit for describing a ship's cargo carrying capacity, or a shipping terminal's cargo handling capacity

3. A Geographic Agent-Based Model with Built-in Feedback among Economic Tiles

The GVCs for bamboo floor tiles and sea buckthorn plants have been traced through “economic tiles” in the study area in Figure 4. Each tile is mapped with coordinates A to O from North to South, and 1 to 23 from West to East.

Investments are normally strung along production and value chains for tradables. Therefore, tiles present a way to trace how changes in economic activity or infrastructure in one area reverberate along the value chain to other areas linked by an investment corridor.

With the help of GVC development and analysis across an economic region, the potential growth for existing and future export production sites can be analyzed. Being an independent economy, production, consumption, and trade can take place within geographic tiles. Trade can also occur between tiles. However, the costs of transportation and connectivity need to be taken into account for inter-tile trade.

The features of tiles allow us to represent all phases of GVCs, from inbound logistics to operations, outbound logistics, marketing, and sales. Production can be dispersed geographically, as well as over time. The model also allows direct assessment of the potential impact of infrastructure investments that affect the cost of transportation across tiles.

The use of tiles to conceptualize the real world—and the effect of changes in one location of the economy on another location—is illustrated in Figure 4, which zeroes in on two value chains as they relate to regional priority corridors. ADB’s focus for investment in the northeastern region of South Asia corresponds with these corridors and with potential trade-related infrastructure investments to enhance three GVCs in the region that have been identified for their export potential: bamboo floor tiles, ceramics, and the seabuckthorn medicinal plant.

Goods transport, travel times, and cost matrices are computed using data collected from the field in cases with and without future project investment. Thus, different investment scenarios can be compared; for instance, a scenario could focus on one particular regional trade and transit corridor to see how the result is different over time, and how it compares with alternative corridor investments. By locating the comparative advantage of the northeastern region of South Asia, it becomes empirically possible to locate further production possibilities nearby and to map their value chain to potential export markets.

We establish a benchmark and then examine the gains in the linear economy that arise from two kinds of infrastructure investments. The experiment described here is driven by the two varieties. The focus of both is on incomes, geographic distribution, and the dispersion of prices as a measure of the benefits of infrastructure investments and on gains in trade flows.

4. Investment Scenarios

Three specific scenarios are simulated in accordance with the need for a benchmark in which changes with no additional infrastructure are described. The benchmark is a starting point in the computational methodology for assessing the potential effects of project and policy investments on data tiles across a value chain.

The three scenarios are as follows:

(S1) The existing (present day) network logistics of roads and trains—the benchmark case.

(S2) The transport network in S1 is enhanced by a set of non-perishable road and/or rail infrastructure investment (e.g., additional road lanes alongside precise digital locations), the cost of investments, and a “guestimate” of their impact in reducing travel times.

(S3) The transport network in S2 is enhanced by a set of infrastructure improvements in perishable trade supporting infrastructure improvements (e.g., refrigerated or automated warehouses or stockpile storage locations).

The results of the comparisons between the three scenarios are described for administrative districts, at the level of individual tiles, and in aggregate for the entire region affected by the investments. They can be visualized both in final equilibrium outcomes (e.g., costs and welfare) and in the dynamics leading up to equilibrium. For reasons of brevity, only one computational output is shown here in Figure 5, which compares scenario S3 with the baseline S1 in terms of income distribution and differentials over time.

5. Concluding Remarks

It is clear from the trade issues facing South Asia that a region’s competitive advantage in both regional and international trade rests on how effectively it can improve and invest in its logistics infrastructure, and in GVCs that link suppliers (via vertically integrated trade networks) to customer demand. The competitive advantage from traditional proximity to raw materials or cheap labor has increasingly been replaced in recent decades by proximity to markets. The business capacity to produce time- and quality-sensitive consumer goods and services has to be raised in order to move the region more to the center of the global product space.

One general strategy of development and growth is to diversify trade in terms of sectors and markets by branching out into new products in close proximity in product space (horizontal integration). It requires, for instance, the introduction of GVCs and complementary improvements in logistics and infrastructure. A second and possibly parallel strategy is to move into higher value-added market segments within established sectors with increasing labor costs, as is the case with India. Another strategy for smaller and landlocked LDCs is to move into niche markets, possibly with higher value-added,

and to make use of subcontracting (vertical integration) in cases of proximity to larger markets such as India. A fourth strategy is pushing processing activities down the value chain, in order to allow greater differentiation in product characteristics closer to the customer, and offering greater flexibility in serving small orders. All of this requires the necessary investment in capacity building in functioning GVCs, together with the necessary logistics and infrastructure investment.

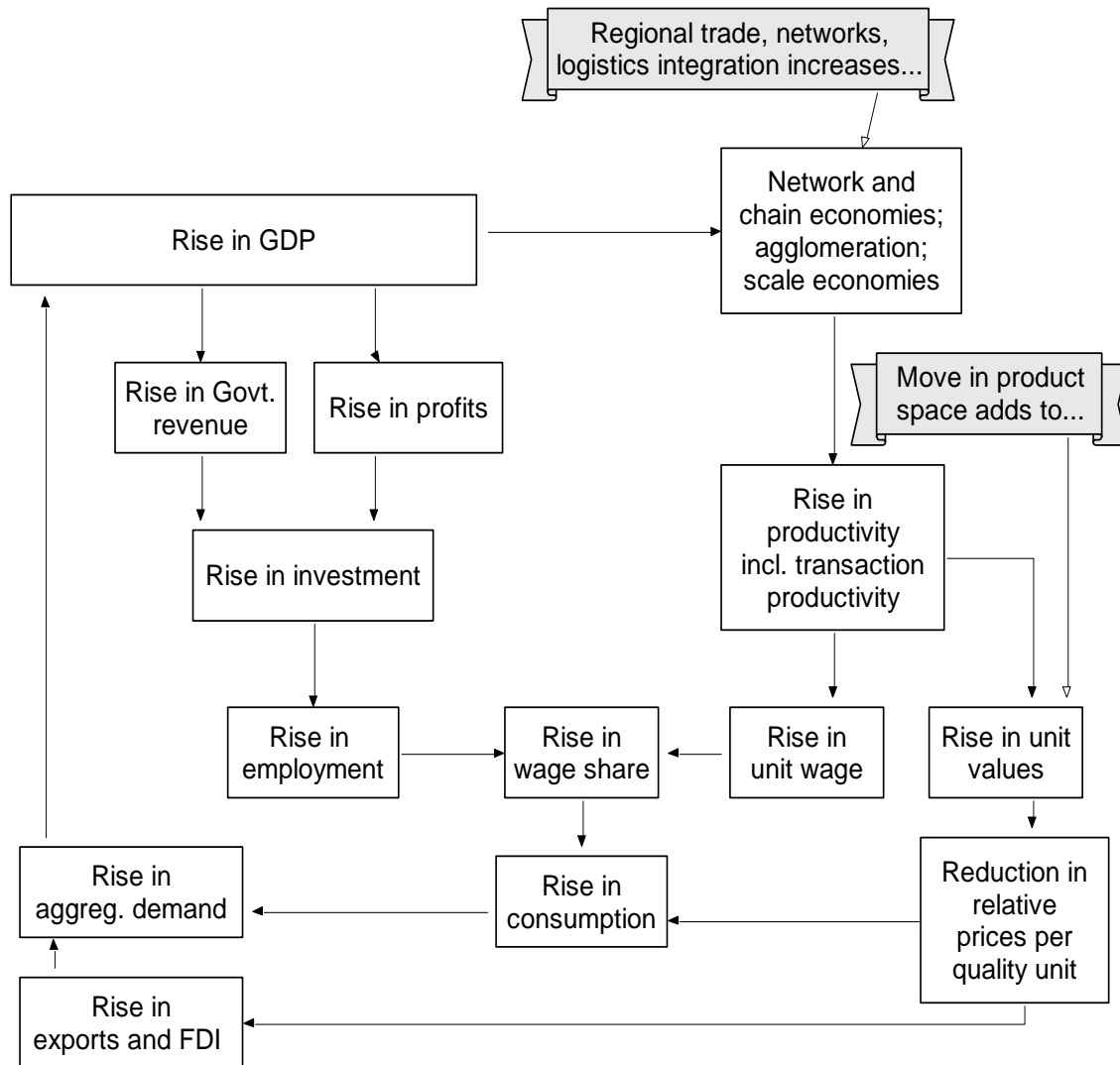
Each of these strategies requires development of new and better GVCs. For new products, there are new sources for inputs, different processing sequences, and different handling requirements. For new markets, there are differences in product standards and order cycle requirements. In some cases, the introduction of a new GVC is itself the new product—such as the introduction of ready-to-eat meals or on-the-rack garments. In others, the value chain generates additional trade—such as the trade in intermediate goods as a result of rebalancing of the production process along a GVC.

This report has mapped the economic space in the modeling area and then used channel-mapping methodology in tracing product flows and transfers through entire GVCs, from the point of product conception to the point of consumption. The methodology has thus measured and quantified costs of trade and the respective distortions that hinder the competitiveness of products and industries in the area. The model as summarized provides a novel methodology and accompanying software platform, giving policymakers a framework in which to evaluate the potential of real projects to bring investment gains to people in the economic periphery. It is embedded in real GVCs and geographies, and able to capture sophisticated spatial economic dynamics, explicitly representing both space and time to adequately project the complexity and consequences of rebalancing within product-specific value chains. Overall, the potential for substantial regional economic rebalancing emerges.

References

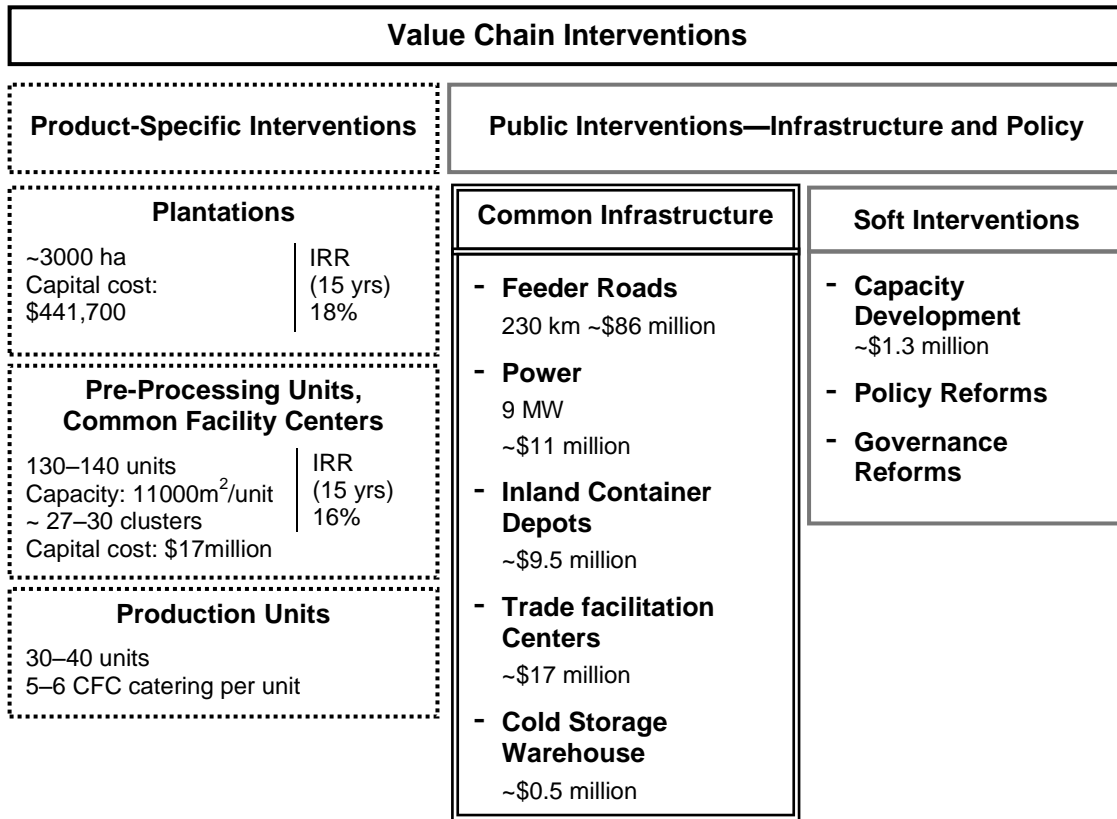
- M. Baccetta et al. 2009. Exposure to External Shocks and the Geographical Diversification of Exports. In R. Newfarmer, W. Shaw, and P. Walkenhorst, eds. *Breaking into New Markets—Emerging Lessons for Export Diversification*. Washington, DC: World Bank.
- O. Cadot, C. Carrere, and V. Strauss-Kahn. 2008. Export Diversification: What's Behind the Hump? *CEPR Discussion Paper*. 6590. London: Centre for Economic Policy Research.
- R. Feenstra and H. L. Kee. 2004. Export Variety and Country Productivity. *NBER Working Paper*. 10830. Cambridge, MA: National Bureau of Economic Research.
- J. Felipe et al. 2012. Product Complexity and Economic Development. *Structural Change and Economic Dynamics*. 23. pp. 36–68.
- T. Harding. 2009. Infrastructure and Diversifying through Better Products. In R. Newfarmer, W. Shaw, and P. Walkenhorst, eds. *Breaking into New Markets—Emerging Lessons for Export Diversification*. Washington, DC: World Bank.
- R. Hausmann et al. 2008. *The Atlas of Economic Complexity—Mapping Paths to Prosperity*. Cambridge, MA: MIT University Press.
- R. Kali and J. Reyes. 2007. The Architecture of Globalization: A Network Approach to International Economic Integration. *Journal of International Business Studies*. 38 (4). pp. 595–620.
- A. Winters. 2009. Regional Integration and Small Countries in South Asia. In E. Ghani and S. Ahmed, eds. *Accelerating Growth and Job Creation in South Asia*. Washington, DC: World Bank.

Figure 1: Regional Economic Integration Feedback



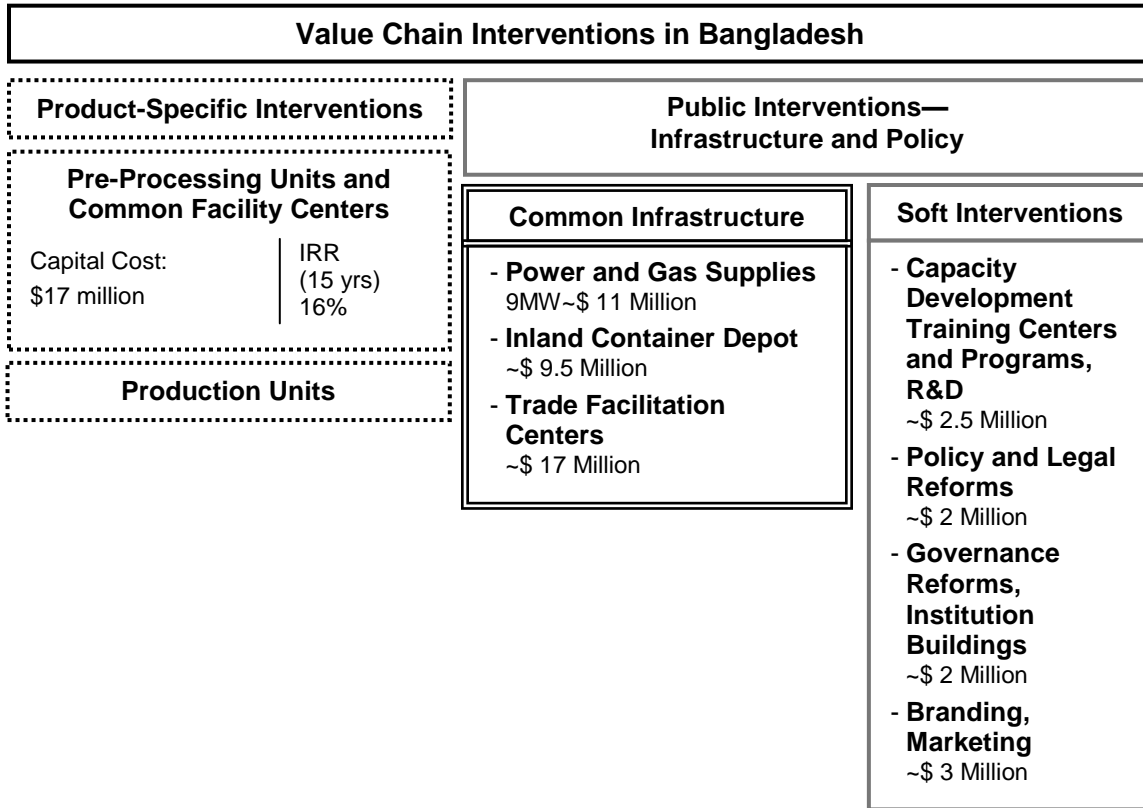
FDI = Foreign direct investment, GDP = Gross domestic product.
 Source: Author's illustration.

**Figure 2: Preliminary Business Plan Scenario:
GVC Interventions in Bamboo Floor Tiles**



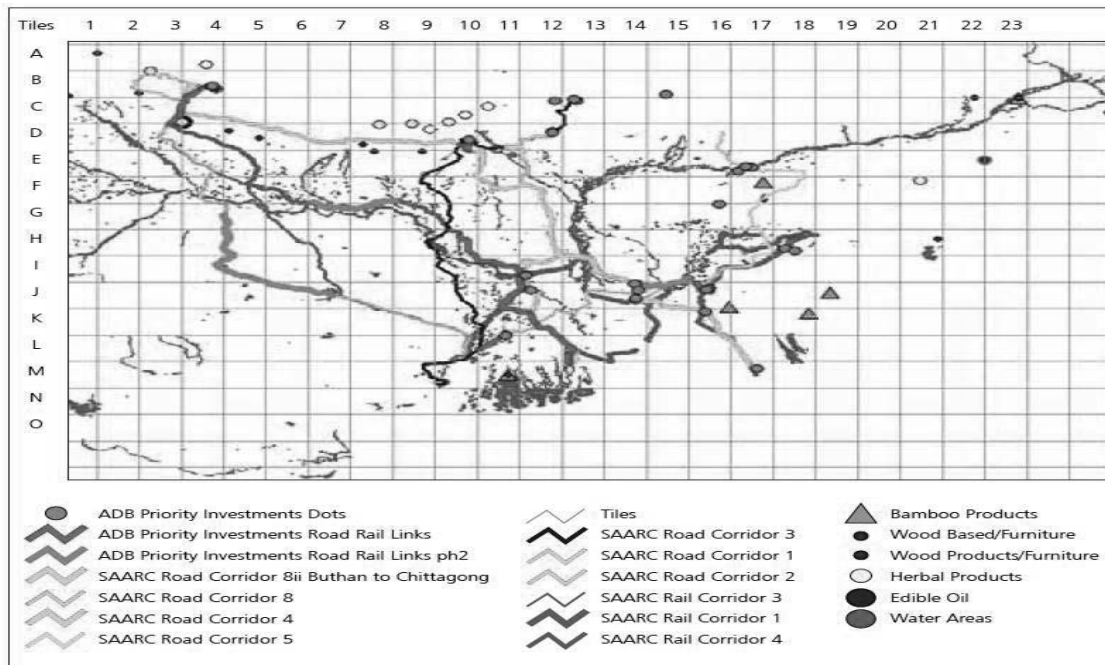
CFC = Common facility centers, GVC = Global value chains, ha = Hectares, IRR = Internal rate of return, km = Kilometers, m = Meters, yrs = Years.
Source: Author's compilation.

Figure 3: GVC Interventions Bangladesh Ceramic Tableware



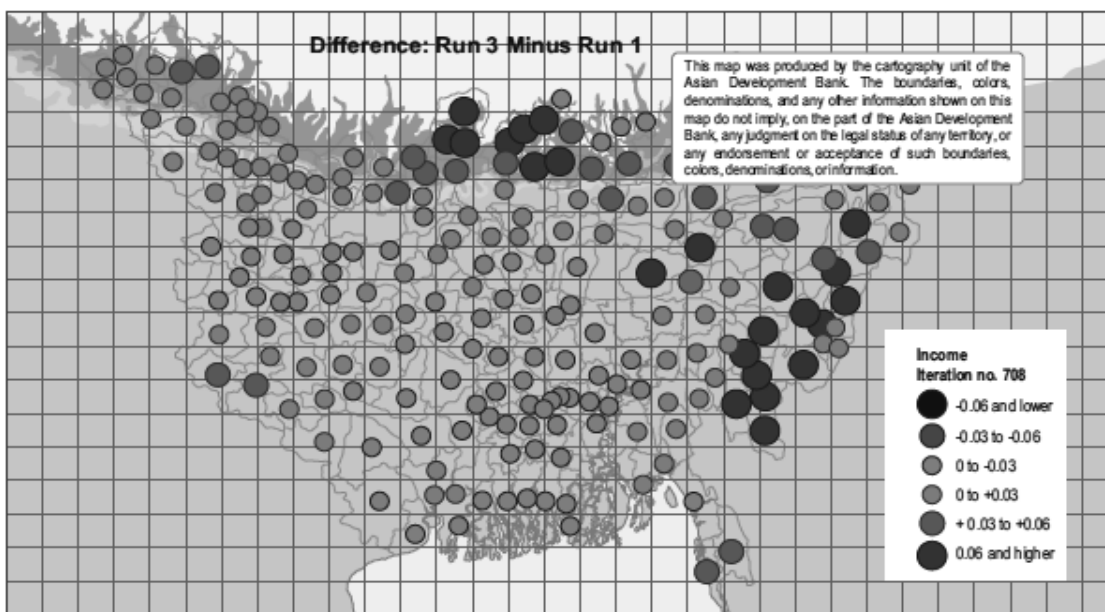
IRR = Implementing rules and regulations, MW = Megawatt, R&D = Research and development.
 Source: Author's compilation

Figure 4: GVC Tracing for Bamboo Floor Tiling and Sea Buckthorn Plants



Source: Author's Illustration.

Figure 5: District Income Growth above Baseline from Full GVC Investment Package



Source: Asian Development Bank.

Table 1: An Example of a Value Chain for Coffee

Farming	Post Harvest	Transport, Shipping, Customs Clearance
Land preparation	Transport to processor	Fumigation
Fertilizer, Manure	Drying	Phytosanitary Certification
Pesticides	Hulling and grading	Transportation
Plant Maintenance	Bagging	Port Charges
Harvesting		THC
		Customs Clearance
		Shipping
		Bank Interest
		Miscellaneous

Source: Global Development Solutions, LLC.

Table 2: Raw Material Imports from India—Transaction Costs, 2009

Item	\$/ton	% of Raw Material Price	% of Total Price
Raw Material Price (Weighted Average), FOB Benapol	200.46	100	79
Duties/Fees		9	7
Customs Duty	15.36		6
Value Added Tax (VAT) ^a	1.80		1
Advanced Income Tax (AIT) ^b			0
Per Shipment Inspection (PSI)	2.61	1	1
Handling/Transport Benapol-Factory		17	13
Offloading/Loading Charges, Benapol/Bumra	13.60	7	5
Overland Transport	14.00	7	6
Offloading, Factory	6.52	3	3
Total	254.35	144	100

^a This VAT figure represents carrying cost 6 months (delayed) refund at 12% approximately. Actual VAT at 15% paid upon import of raw materials.

^b AIT counts towards tax payment - not included in VCA hence left out. Actual AIT at 3% paid upon import of raw materials.

Source: Global Development Solutions, LLC.

Table 3: Plaster of Paris Imports from Thailand—Transaction Costs, 2009

Jan-09 \$ FOREX	70.8				
Net weight	21,488				
Gross weight	21,000				
Pkgs	840				
Container 1x20"					
C&F Bill		Taka	\$	\$/ton	% of Total
Bank Verify		100	1	0.07	0
Customs Duty, Deferred VAT, Charges as per B/E & Assessment Notice		123,368	1,742	82.98	58
Customs Development Charge		70	1	0.05	0
River Dues & Port Charges (Shed Bill) 39 days demurrage		56,265	795	37.84	26
NOC Charges:					
Shipping Charges		23,964	338	16.12	11
Noting, Assessment, Examination, Delivery etc, Customs		5,000	71	3.36	2
Port Expense for Delivery					
Merchant Labor		2,000	28	1.35	1
Agency Commission @0.25% on Assessable Value (Minimum)		3,000	42	2.02	1
		213,767	3,019	144	100

B/E = Bill of export, FOREX = Foreign exchange rate, NOC = Non-operator charges, Pkgs = Price per kilogram, VAT = Value-added tax.

Note: Blank space = unknown data.

Source: Interviews, Global Development Solutions, LLC (January 2009).

Table 4: Summary of Barriers to Competitiveness in Bangladesh

Issues	Public Sector	Private Sector
Political instability	X	
Delayed VAT refunds	X	
Unreliable gas pressure from utilities	X	
Inadequate testing and accreditation regime	X	
Missing transit arrangements with India; high cross-border transaction and handling costs for raw materials	X	
Exorbitant commissions and fees on finance	X	X
Inadequate foreign commercial trade office support; limited to no presence in growing markets of South America, India, and East Asia	X	X
Extremely weak cooperation and coordination within industry (industry association only in name); race-to-the-bottom pricing between producers		X
Porcelain and china tableware market positioning potentially weak		X

Source: Global Development Solutions, LLC.

ADB Working Paper Series on Regional Economic Integration*

1. “The ASEAN Economic Community and the European Experience” by Michael G. Plummer
2. “Economic Integration in East Asia: Trends, Prospects, and a Possible Roadmap” by Pradumna B. Rana
3. “Central Asia after Fifteen Years of Transition: Growth, Regional Cooperation, and Policy Choices” by Malcolm Dowling and Ganeshan Wignaraja
4. “Global Imbalances and the Asian Economies: Implications for Regional Cooperation” by Barry Eichengreen
5. “Toward Win-Win Regionalism in Asia: Issues and Challenges in Forming Efficient Trade Agreements” by Michael G. Plummer
6. “Liberalizing Cross-Border Capital Flows: How Effective Are Institutional Arrangements against Crisis in Southeast Asia” by Alfred Steinherr, Alessandro Cisotta, Erik Klär, and Kenan Šehović
7. “Managing the Noodle Bowl: The Fragility of East Asian Regionalism” by Richard E. Baldwin
8. “Measuring Regional Market Integration in Developing Asia: a Dynamic Factor Error Correction Model (DF-ECM) Approach” by Duo Qin, Marie Anne Cagas, Geoffrey Ducanes, Nedelyn Magtibay-Ramos, and Pilipinas F. Quising
9. “The Post-Crisis Sequencing of Economic Integration in Asia: Trade as a Complement to a Monetary Future” by Michael G. Plummer and Ganeshan Wignaraja
10. “Trade Intensity and Business Cycle Synchronization: The Case of East Asia” by Pradumna B. Rana
11. “Inequality and Growth Revisited” by Robert J. Barro
12. “Securitization in East Asia” by Paul Lejot, Douglas Arner, and Lotte Schou-Zibell
13. “Patterns and Determinants of Cross-border Financial Asset Holdings in East Asia” by Jong-Wha Lee
14. “Regionalism as an Engine of Multilateralism: A Case for a Single East Asian FTA” by Masahiro Kawai and Ganeshan Wignaraja

15. “The Impact of Capital Inflows on Emerging East Asian Economies: Is Too Much Money Chasing Too Little Good?” by Soyoung Kim and Doo Yong Yang
16. “Emerging East Asian Banking Systems Ten Years after the 1997/98 Crisis” by Charles Adams
17. “Real and Financial Integration in East Asia” by Soyoung Kim and Jong-Wha Lee
18. “Global Financial Turmoil: Impact and Challenges for Asia’s Financial Systems” by Jong-Wha Lee and Cyn-Young Park
19. “Cambodia’s Persistent Dollarization: Causes and Policy Options” by Jayant Menon
20. “Welfare Implications of International Financial Integration” by Jong-Wha Lee and Kwanho Shin
21. “Is the ASEAN-Korea Free Trade Area (AKFTA) an Optimal Free Trade Area?” by Donghyun Park, Innwon Park, and Gemma Esther B. Estrada
22. “India’s Bond Market—Developments and Challenges Ahead” by Stephen Wells and Lotte Schou- Zibell
23. “Commodity Prices and Monetary Policy in Emerging East Asia” by Hsiao Chink Tang
24. “Does Trade Integration Contribute to Peace?” by Jong-Wha Lee and Ju Hyun Pyun
25. “Aging in Asia: Trends, Impacts, and Responses” by Jayant Menon and Anna Melendez-Nakamura
26. “Re-considering Asian Financial Regionalism in the 1990s” by Shintaro Hamanaka
27. “Managing Success in Viet Nam: Macroeconomic Consequences of Large Capital Inflows with Limited Policy Tools” by Jayant Menon
28. “The Building Block versus Stumbling Block Debate of Regionalism: From the Perspective of Service Trade Liberalization in Asia” by Shintaro Hamanaka
29. “East Asian and European Economic Integration: A Comparative Analysis” by Giovanni Capannelli and Carlo Filippini
30. “Promoting Trade and Investment in India’s Northeastern Region” by M. Govinda Rao

31. “Emerging Asia: Decoupling or Recoupling” by Soyoung Kim, Jong-Wha Lee, and Cyn-Young Park
32. “India’s Role in South Asia Trade and Investment Integration” by Rajiv Kumar and Manjeeta Singh
33. “Developing Indicators for Regional Economic Integration and Cooperation” by Giovanni Capannelli, Jong-Wha Lee, and Peter Petri
34. “Beyond the Crisis: Financial Regulatory Reform in Emerging Asia” by Chee Sung Lee and Cyn-Young Park
35. “Regional Economic Impacts of Cross-Border Infrastructure: A General Equilibrium Application to Thailand and Lao People’s Democratic Republic” by Peter Warr, Jayant Menon, and Arief Anshory Yusuf
36. “Exchange Rate Regimes in the Asia-Pacific Region and the Global Financial Crisis” by Warwick J. McKibbin and Waranya Pim Chanthapun
37. “Roads for Asian Integration: Measuring ADB’s Contribution to the Asian Highway Network” by Srinivasa Madhur, Ganeshan Wignaraja, and Peter Darjes
38. “The Financial Crisis and Money Markets in Emerging Asia” by Robert Rigg and Lotte Schou-Zibell
39. “Complements or Substitutes? Preferential and Multilateral Trade Liberalization at the Sectoral Level” by Mitsuyo Ando, Antoni Estevadeordal, and Christian Volpe Martincus
40. “Regulatory Reforms for Improving the Business Environment in Selected Asian Economies—How Monitoring and Comparative Benchmarking can Provide Incentive for Reform” by Lotte Schou-Zibell and Srinivasa Madhur
41. “Global Production Sharing, Trade Patterns, and Determinants of Trade Flows in East Asia” by Prema-chandra Athukorala and Jayant Menon
42. “Regionalism Cycle in Asia (-Pacific): A Game Theory Approach to the Rise and Fall of Asian Regional Institutions” by Shintaro Hamanaka
43. “A Macroprudential Framework for Monitoring and Examining Financial Soundness” by Lotte Schou-Zibell, Jose Ramon Albert, and Lei Lei Song
44. “A Macroprudential Framework for the Early Detection of Banking Problems in Emerging Economies” by Claudio Loser, Miguel Kiguel, and David Mermelstein

45. "The 2008 Financial Crisis and Potential Output in Asia: Impact and Policy Implications" by Cyn-Young Park, Ruperto Majuca, and Josef Yap
46. "Do Hub-and-Spoke Free Trade Agreements Increase Trade? A Panel Data Analysis" by Jung Hur, Joseph Alba, and Donghyun Park
47. "Does a Leapfrogging Growth Strategy Raise Growth Rate? Some International Evidence" by Zhi Wang, Shang-Jin Wei, and Anna Wong
48. "Crises in Asia: Recovery and Policy Responses" by Kiseok Hong and Hsiao Chink Tang
49. "A New Multi-Dimensional Framework for Analyzing Regional Integration: Regional Integration Evaluation (RIE) Methodology" by Donghyun Park and Mario Arturo Ruiz Estrada
50. "Regional Surveillance for East Asia: How Can It Be Designed to Complement Global Surveillance?" by Shinji Takagi
51. "Poverty Impacts of Government Expenditure from Natural Resource Revenues" by Peter Warr, Jayant Menon, and Arief Anshory Yusuf
52. "Methods for Ex Ante Economic Evaluation of Free Trade Agreements" by David Cheong
53. "The Role of Membership Rules in Regional Organizations" by Judith Kelley
54. "The Political Economy of Regional Cooperation in South Asia" by V.V. Desai
55. "Trade Facilitation Measures under Free Trade Agreements: Are They Discriminatory against Non-Members?" by Shintaro Hamanaka, Aiken Tafgar, and Dorothea Lazaro
56. "Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?" by Prema-chandra Athukorala
57. "Global Financial Regulatory Reforms: Implications for Developing Asia" by Douglas W. Arner and Cyn-Young Park
58. "Asia's Contribution to Global Rebalancing" by Charles Adams, Hoe Yun Jeong, and Cyn-Young Park
59. "Methods for Ex Post Economic Evaluation of Free Trade Agreements" by David Cheong
60. "Responding to the Global Financial and Economic Crisis: Meeting the Challenges in Asia" by Douglas W. Arner and Lotte Schou-Zibell

61. “Shaping New Regionalism in the Pacific Islands: Back to the Future?” by Satish Chand
62. “Organizing the Wider East Asia Region” by Christopher M. Dent
63. “Labour and Grassroots Civic Interests In Regional Institutions” by Helen E.S. Nesadurai
64. “Institutional Design of Regional Integration: Balancing Delegation and Representation” by Simon Hix
65. “Regional Judicial Institutions and Economic Cooperation: Lessons for Asia?” by Erik Voeten
66. “The Awakening Chinese Economy: Macro and Terms of. Trade Impacts on 10 Major Asia-Pacific Countries” by Yin Hua Mai, Philip Adams, Peter Dixon, and Jayant Menon
67. “Institutional Parameters of a Region-Wide Economic Agreement in Asia: Examination of Trans-Pacific Partnership and ASEAN+ α Free Trade Agreement Approaches” by Shintaro Hamanaka
68. “Evolving Asian Power Balances and Alternate Conceptions for Building Regional Institutions” by Yong Wang
69. “ASEAN Economic Integration: Features, Fulfillments, Failures, and the Future” by Hal Hill and Jayant Menon
70. “Changing Impact of Fiscal Policy on Selected ASEAN Countries” by Hsiao Chink Tang, Philip Liu, and Eddie C. Cheung
71. “The Organizational Architecture of the Asia-Pacific: Insights from the New Institutionalism” by Stephan Haggard
72. “The Impact of Monetary Policy on Financial Markets in Small Open Economies: More or Less Effective During the Global Financial Crisis?” by Steven Pennings, Arief Ramayandi, and Hsiao Chink Tang
73. “What do Asian Countries Want the Seat at the High Table for? G20 as a New Global Economic Governance Forum and the Role of Asia” by Yoon Je Cho
74. “Asia’s Strategic Participation in the Group of 20 for Global Economic Governance Reform: From the Perspective of International Trade” by Taeho Bark and Moonsung Kang
75. “ASEAN’s Free Trade Agreements with the People’s Republic of China, Japan, and the Republic of Korea: A Qualitative and Quantitative

Analysis” by Gemma Estrada, Donghyun Park, Innwon Park, and Soonchan Park

76. “ASEAN-5 Macroeconomic Forecasting Using a GVAR Model” by Fei Han and Thiam Hee Ng
77. “Early Warning Systems in the Republic of Korea: Experiences, Lessons, and Future Steps” by Hyungmin Jung and Hoe Yun Jeong
78. “Trade and Investment in the Greater Mekong Subregion: Remaining Challenges and the Unfinished Policy Agenda” by Jayant Menon and Anna Cassandra Melendez
79. “Financial Integration in Emerging Asia: Challenges and Prospects” by Cyn-Young Park and Jong-Wha Lee
80. “Sequencing Regionalism: Theory, European Practice, and Lessons for Asia” by Richard E. Baldwin
81. “Economic Crises and Institutions for Regional Economic Cooperation” by C. Randall Henning
82. “Asian Regional Institutions and the Possibilities for Socializing the Behavior of States” by Amitav Acharya
83. “The People’s Republic of China and India: Commercial Policies in the Giants” by Ganeshan Wignaraja
84. “What Drives Different Types of Capital Flows and Their Volatilities” by Rogelio Mercado and Cyn-Young Park
85. “Institution Building for Africal Regionalism” by Gilbert M. Khadiagala
86. “Impediments to Growth of the Garment and Food Industries in Cambodia: Exploring Potential Benefits of the ASEAN-PRC FTA” by Vannarith Chheang and Shintaro Hamanaka
87. “The Role of the People’s Republic of China in International Fragmentation and Production Networks: An Empirical Investigation” by Hyun-Hoon Lee, Donghyun Park, and Jing Wang
88. “Utilizing the Multiple Mirror Technique to Assess the Quality of Cambodian Trade Statistics: by Shintaro Hamanaka
89. “Is Technical Assistance under Free Trade Agreements WTO-Plus?” Review of Japan–ASEAN Economic Partnership Agreements” by Shintaro Hamanaka

90. "Intra-Asia Exchange Rate Volatility and Intra-Asia Trade: Evidence by of Goods" by Hsiao Chink Tang
91. "Is Trade in Asia Really Integrating?" by Shintaro Hamanaka
92. "The PRC's Free Trade Agreements with ASEAN, Japan, and the Republic of Korea: A Comparative Analysis" by Gemma Estrada, Donghyun Park, Innwon Park, and Soonchan Park
93. "Assessing the Resilience of ASEAN Banking Systems: The Case of Philippines" by Jose Ramon Albert and Thiam Hee Ng
94. "Strengthening the Financial System and Mobilizing Savings to Support More Balanced Growth in ASEAN+3" by A. Noy Siackhachanh
95. "Measuring Commodity-Level Trade Costs in Asia: The Basis for Effective Trade Facilitation Policies in the Region" by Shintaro Hamanaka and Romana Domingo
96. "Why do Imports Fall More than Exports Especially During Crises? Evidence from Selected Asian Economies" by Hsiao Chink Tang
97. "Determinants of Local Currency Bonds and Foreign Holdings: Implications for Bond Market Development in the People's Republic of China" by Kee-Hong Bae
98. "ASEAN–China Free Trade Area and the Competitiveness of Local Industries: A Case Study of Major Industries in the Lao People's Democratic Republic" by Leebeer Leebouapao, Sthabandith Insisienmay, and Vanthana Nolintha
99. "The Impact of ACFTA on People's Republic of China-ASEAN Trade: Estimates Based on an Extended Gravity Model for Component Trade" by Yu Sheng, Hsiao Chink Tang, and Xinpeng Xu
100. "Narrowing the Development Divide in ASEAN: The Role of Policy" by Jayant Menon
101. "Different Types of Firms, Products, and Directions of Trade: The Case of the People's Republic of China" by Hyun-Hoon Lee, Donghyun Park, and Jing Wang
102. "Anatomy of South–South FTAs in Asia: Comparisons with Africa, Latin America, and the Pacific Islands" by Shintaro Hamanaka
103. "Japan's Education Services Imports: Branch Campus or Subsidiary Campus?" by Shintaro Hamanaka

104. “A New Regime of SME Finance in Emerging Asia: Empowering Growth-Oriented SMEs to Build Resilient National Economies” by Shigehiro Shinozaki
105. “Critical Review of East Asia – South America Trade ” by Shintaro Hamanaka and Aiken Tafgar
106. “The Threat of Financial Contagion to Emerging Asia’s Local Bond Markets: Spillovers from Global Crises” by Iwan J. Azis, Sabyasachi Mitra, Anthony Baluga, and Roselle Dime
107. “Hot Money Flows, Commodity Price Cycles, and Financial Repression in the US and the People’s Republic of China: The Consequences of Near Zero US Interest Rates” by Ronald McKinnon and Zhao Liu
108. “Cross-Regional Comparison of Trade Integration: The Case of Services” by Shintaro Hamanaka
109. “Preferential and Non-Preferential Approaches to Trade Liberalization in East Asia: What Differences Do Utilization Rates and Reciprocity Make?” by Jayant Menon

*These papers can be downloaded from (ARIC) <http://aric.adb.org/archives.php?section=0&subsection=workingpapers> or (ADB) <http://www.adb.org/publications/series/regional-economic-integration-working-papers>

Can Global Value Chains Effectively Serve Regional Economic Development in Asia?

This paper presents a new tool for policy makers to foster regional economic integration and pursue the overarching development objective of more inclusive growth across a region.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.7 billion people who live on less than \$2 a day, with 828 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.