The perils of globalism: The Asian experience

By Eduardo S. Noel, Jr.
Assistant Professor, Economics Department

Few subjects have polarized people throughout the world as much as globalization. Some see it as the way of the future, bringing unprecedented prosperity to everyone, everywhere. Others, symbolized by the Seattle protestors of December 1999, fault globalization as the source of untold problems, from destruction of native cultures to increasing poverty and immiseration. From the preceding sentences, it is obvious that the term “Globalization” has acquired considerable emotive force. Some view it as a process that is beneficial, a key to future world economic development and also inevitable and irreversible. Others regard it with hostility, even fear, believing that it increases inequality within and between nations, threatens employment and living standards and thwarts social progress. This article will focus on the dangers and the ugly dark side of globalization as it affected some countries in Asia.

Globalization

Although the term defies simple definition, economists agree that globalization has several core characteristics:

• Unprecedented economic interdependence, driven by cross-border capital movements, rapid technology transfer, and “real time” communication and information flows;

• Rise of new actors that challenge state authority, particularly non-government organizations (NGO’s) and civil groups, truly global firms and production networks, and even financial markets;

• Growing pressure on states to conform to new international standards of governance, particularly in the areas of transparency, accountability, and the rule of law;

• The emergence of an increasingly Western-dominated international culture, a trend which has sparked concern about the erosion of national identity and traditional values in many Asian countries; and

• The rise of increasingly severe transnational problems—such as energy and environmental concerns, large-scale migration flows, and organized crime networks— that require multilateral cooperation to resolve.

At its most basic, there is nothing mysterious about globalization. The term has come into common usage since the 1980s,
reflecting technological advances that have made it easier and quicker to compete beyond national borders.

Markets promote efficiency through competition and the division of labor, the specialization that allows people and economies to focus on what they do best. Moreover, companies can now take advantage of global markets. It means that they can have access to more capital flows, and larger export markets. But markets do not necessarily ensure that all shares the benefits of increased efficiency. Countries must be prepared to embrace the policies needed; and, in the case of the poorest countries, may need the support of the international community as they do so.

The Philippine experience

Nowadays, a dominant macroeconomic strategy worldwide is “globalization.” Philippine economic planners and technocrats tow the line, saying we need to open the country’s economy through accelerated liberalization, deregulation and privatization of the economy. These policies, which have been in place since the mid 1980’s, have transformed the Philippine economy into an appendage of the global economy. But prosperity has been elusive. The globalized Philippine economy keeps sinking. Under trade liberalization, local industries and agriculture are defeated by global competition, some under grossly unfair terms of competition. The first to suffer was the textile industry; followed by the shoe, tire manufacturing, steel, chemical and cement industries.

In the case of agriculture, right after the ratification of the World Trade Organization (WTO) and long before the El Niño and La Niña phenomena, the Philippines became a major agricultural importer or rice, corn, meat, cereal preparation, sugar, vegetable oil, wine, fruits, etc. Today, with the foreign dumping of poultry and fishery products, the poultry and fishery industries are also about to collapse.

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The Indian experience

Take another example, this time in India. Let us suppose that the MNC is actually very “efficient” and is able to drive its more “inefficient” Indian competitors out of business. With its Indian competitors out of business, it could then raise prices over and beyond what the “inefficient” Indian companies charged their consumers. Here is another example where “efficient” from the point of view of the business does not translate into benefits for the Indian consumer. This has occurred not only in the soft-drinks sector; it has also occurred in the pharmaceutical sector.

Others have argued that the presence of multinationals would end the corrupt practices that hurt the ‘efficiency’ of India’s public sector companies. The power sector is one such area where there is a clamour for speedy privatizations. But consider a recent Times of India report (17 July 2000) where a reporter by the comptroller and auditor-general (CAO) of India was cited, pointing to the wastage of crores of rupees in the process of privatizing Orissa’s power sector. According to the report, foreign consultants were appointed in violation of guidelines and no attempt was made to engage domestic firms for the purpose.
The consultants, engaged to “effectively start and give a momentum to the reform programmed”, were given a 582 percent increase over the original estimated time to do their work. However, their word spilled over to the third stage forcing the state to cough up an additional expense of Rs 72.96 crore. A sum of Rs 2.95 crore was reimbursed to them without verification of supporting documents, the report pointed out. The implicated agency was DFID of Britain.

The report said that during the selection process, World Bank’s senior energy economist virtually put pressure on the government to opt for foreign firms, particularly KPMG, UK, and Arthur Andersen, USA, and sent the list for approval. The state government agreed to the WB official’s suggestion without inquiring into the firm’s experience and capabilities, the CAG report said.

The WB staff, in violation of the bank’s own guidelines and without request from the government, also reviewed the proposals submitted by the shortlisted consultants and took Rs 2.2 lakh as service charges.

A consortium of consultants led by KPMG was finally chosen, with whom the state government entered into an agreement. The other members of the consortium included the National Economic Research Associates, Inc. (NERA), USA, Mckenna & Co., London, and Monenco Agra Inc., Canada. Globalization of Orissa’s power industry—one of the few power surplus states in the country—has brought neither improved service nor lower costs.

In Maharashtra, Enron remains the most expensive supplier of power, charging the Maharashtra State Electricity Board more than double what Tata Electricity company charges. Moreover, its power is produced using imported fuels making India more dependent on international market.

There is also an assertion that globalization allows India to allocate scarce capital more efficiently because the Indian government could concentrate on areas that need special attention. But few seem to note that in this decade of globalization, the government has been steadily reducing its ability to fund vital social needs or infrastructural needs. Numerous tax breaks have been given to MNC’s to set up manufacturing plants in India. States have competed with each other in offering concessions to MNC’s. Maharashtra gave huge concessions to Skoda for its automobile plant near Aurangabad. Tamil Nadu offered special incentives to GM to set up its plant near Chennai. Karnataka and Andhra Pradesh have been competing to attract IT businesses in their state. Even the Central Government has joined in the act.

In the report titled “Export give-aways to cost government Rupees 760 cr”, Janathí Ayangar (Economics Times) wrote about the various holidays provided to exporters. The detailed report suggested that with violations and other means of tax evasion, the loss to the government may amount to 1000 crores. Rather than increase the government’s ability to solve pressing problems, globalization has actually weakened the government’s financial ability to intervene in the areas of education, healthcare and essential infrastructure.

Two years ago, (Deccan Herald, Aug. 7, 1998) noted economist and deputy-chairman of the state planning board Dr. DE M Nanjundappa has termed as “a bad commercial proposition” the export incentives announced by former Union Commercial Minister Ramakrishna Hedge. “Excessive higher dependence on foreign capital inflows and the rise in exports is likely to be dangerous. Unless there is sustained growth in exports arising from improving the competitive strength of Indian industry, our hope to recover will be will-of-the-wisp, he said. Referring to the incentives offered for exports during 1995-96 by the Narasimha Rao government, he said the revenue loss varied between rupees 18,000 crore and rupees 23,000 crore, exports rose only by rupees 10,000 crore. Losing rupees 25,000 crore of revenue to get export earnings of rupees 10,000 crore was not a good proposition adding that the lost revenues and its implications were crucial. Two years later, his concern remains just as valid since the trade deficit has widened to a record 4 billion dollars for the last quarter. India’s trade deficit grew almost 27% for the last quarter in spite of a substantial increase in exports. Although much of the rise came from fuel imports, growing fuel imports are themselves a negative consequence of poorly thought out liberalization. As already noted in the previous articles, liberalization has done little to solve India’s oil import bill jumped 95%.

Critics of indiscriminate liberalization have warned that one of the biggest dangers of a totally liberalized economy would be the anarchic development of select geographical areas and the neglect of the industrially unpopular areas. Tusar Mohanty of the Economic Times Research Bureau has reinforced this a report. The report pointed out that of all the industrial entrepreneurs memorandum (IEM) filed since the economic policy came into being in June 1991, only 10% have been implemented so far. In the case of implemented projects, only 10% of the employment commitments were actually realized. He goes on to say that apart from poor implementation rate, what must be disturbing for both the planners and the government is the strong regional bias of the investment proposals. Proving the critics right, (who at the beginning in the reforms had doubted the chances of industrial backward states to derive benefits from the reforms), more and more IEM’s have gone to industrially developed states.

Others studies also show that the prosperous states like Maharashtra, Gujarat, and Tamil Nadu and the National Capital Region around Delhi have attracted most of the new investment proposals — especially those from multinationals. In contrast, Mohanty reported that West Bengal, Orissa, Bihar, and Assam each had less than one percent share of the total IEM’s filed during the period. Their shares in actual investment were even lower.

Another aspect of non-selective glo-
balization is that a few select sectors—namely consumer goods, automobiles, and software—have attracted almost 90% of all foreign investment. There have been very little investment in the production of advanced electronics, computer or telecom hardware, aircrafts, advanced industrial materials, capital goods and modern tools and equipment, or robotics. These are the areas where India is completely dependent on imports and is likely to fall further behind. Rather than steer production in areas of cutting-edge technology, state governments have been falling over each other in giving MNC’s more concessions to produce more of what it is already producing!

Other Asian countries’ experiences

What caused the transformation from “miracle to debacle” of countries like Thailand, Malaysia, Indonesia, and Korea? Compared to other newly industrializing countries or NIC’s, the Southeast Asian NIC’s were more dependent on foreign capital inflows to fuel economic growth. The first phase of the rise to tigerhood was massive capital inflows from Japan from the mid-80’s to the early 90’s. Japan had been heavily investing in the region to seek out cheap production sites that gave it global competitiveness. This sparked a decade-long growth of 7-10 percent that was envied by the rest of the world. Slowly, however, Japanese investments tapered off, and simply stopped for countries like Thailand. The Southeast Asian economies, which were already addicted to foreign capital by this time, suddenly found themselves lacking in savings and huge investments needed to continue as before with their strategy of “fast-track capitalism”.

To their relief, another source of foreign capital showed the way out at least temporarily. This came in the form of large amounts of all kinds of funds mostly from the USA, invested in various institutions that were tracking down the highest returns offered anywhere in the world. Conditions had to be conducive enough to draw them in, so with the go-ahead from the International Monetary Fund (IMF), the East Asian countries began to reorient their economies toward export-promotion. They removed controls on the inflows and outflow of capital through liberalization policies.

The formula was a big success, attracting new money of around $4-5 billion, but not without a downside. Such moves rendered the East Asian economies vulnerable to the volatility of international finance.

Meanwhile, the Philippines saw in Thailand a model it could replicate, and was able to attract around $19.4 billion from 1993 through 1997. Dollar loans of Filipino banks also rose during the same period from $2 to $11.6 billion. The new funds could have been put into good use in the manufacturing and agricultural sectors but much of these turned out to be short-term speculative capital seeking the quickest, most high-yielding investments.

Development financing—a response to globalization?

The East Asian financial crisis was a wake-up call that prompted the United Nations to reopen decades of debate on the central issue of finance for development (FfD) or paying for social and economic progress in poor countries. FfD has been so contentious a matter between North and South that officially considering a UN conference on development financing has been repeatedly postponed. But the changing economic
landscape refocused attention on the long-standing issue as it underscored the importance and growing interdependence of economies.

Since the UN decided at the 52nd General Assembly (1997-1998) to reinitiate dialogue on FfD, it has encouraged the staging of a high-level intergovernmental forum no later than 2001.

The basis for pursuing FfD remains vast. Global indicators define the challenge:

- More than 260 million children are out of school at the primary and secondary levels;
- Around 1.5 billion people are not expected to survive at the age of 60;
- Nearly 1.3 billion people live on less than a dollar a day, and close to 1 billion cannot meet their basic consumption requirements. The share in the global income of the richest fifth of the world’s people is 74 times that of the poorest fifth;
- Nearly 340 million women are not expected to survive to age 40; and
- Nearly 160 million children are malnourished.

Development financing responds to the fact that globalization has not benefited many developing nations, and as such, address a wide variety of issues. First, the type of financing and specific area in which funds are spent must be determined. For example, opening a factory in a developing country that generates employment and increases income may be subsidized by a private foreign direct investment but building elementary schools perhaps requires domestic savings. Financing may be sourced from local groups, national governments, and private companies and international agencies that have access to different amounts and kinds of resources.

Conclusion

The FfD debate dovetails with the wider development discourses of the 90s that saw major conferences initiated by the UN on women, children, the environment, population, food, and human settlements, etc. that expanded social development and environmental sustainability. All these processes has given sharper focus to FfD.

The FfD process continues to prosper, marked recently by the meeting of the General Assembly’s second committee at which Nigeria and Mexico introduced a draft resolution of FfD, including net transfer of resources between developing and developed countries. It urges building “a new financial architecture responsive to the priorities of growth and development, especially in developing countries and... the promotion of economic and social equity. Some of its salient points for the UN General Assembly to adopt:

- To call on the international community (the World Bank, regional development banks, etc.) working with the private sector to promote long-term private financial flows to all developing countries;
- To create an environment conducive to development and to the elimination of poverty;
- To implement an open, equitable, rule-based, predictable and non-discriminatory multilateral trading and financial system;
- To outline the need for broadening and strengthening the participation of developing countries in the international economic decision-making process;
- To stress the need for adequate resources at the sub regional, regional and international levels to provide emergency financing in a timely manner to countries affected by financial crisis, particularly access to adequate supplementary funding by the IMF.

Debates around development financing may seem technical and abstract but without the trappings, the core issues basically involve people, “the poorest people who have the most to gain or lose in the search for funding for equitable, sustainable development.”

The FfD process offers many opportunities for participation and learning on all sides. “There are no easy or quick answers to the challenge of development,” the UN points out. “The long term nature of development makes it worth an investment of thoughtful attention and financial support.”

Reference


Prospect of potential uses of Interregional Input-Output in policy formulation and development in the Philippines

By Cristela Goces-Dakila
Associate Professor,
Economics Department

This paper will explore different possibilities of utilizing interregional input-output data in the formation of economic development policy with specific emphasis on environment related concerns in Metro Manila.

It has the following objectives: (1) to give a brief background on the evolution of regional input-output construction in the Philippines; (2) to present the status of regional input-output construction; (3) to elaborate on the advantage of utilizing an interregional/multiregional perspective over a single region input-output model; (4) to identify concrete applications of interregional input-output data and policy directions which may be taken by planners.

Historical Background of Regional Input-Output Modeling in RP

Input-output table construction in the Philippines is at the national level. The National Statistical Coordination Board (NSCB) puts only national input-output tables together. Usually, IO table construction is synchronized during years when actual census of establishment is undertaken. In contrast, construction of regional input-output tables is still in its pioneering stage in the Philippines. There has been no official decree to create regional input-output tables on a regular basis.

The release of national input-output tables in the Philippines started in 1961 with the production of a 50-sector national transactions table, direct coefficient table and inverse matrix. This was a non-competitive input-output table expressed in producers' price and purchasers' price. In contrast, the latest national IO table was published in 1994 expressed in producers' price and purchasers' price with a 59 by 59 dimension and a smaller version with 11 production sectors. The unpublished 1994 IO table has 229 IO sectors together with satellite tables of trade and transport matrix and import matrix.

Currently, it is the National Statistical Coordination Board (NSCB) that takes charge of putting together data for a national input-output table. The Philippines IO series comes out about every four years. So from 1961, the next one was in 1969, then 1974, then 1978 (an updated table). However, a 1979 table was constructed using 66 sectors and a more compressed one using 25 sectors. In 1983 (an updated table), a 66 by 66 input-output table and 25 by 25 input-output tables were built using non-survey methods. In 1985, a 59-sector national input-output table was published.
with a smaller table using 11 sectors. In 1988, using survey data, a huge unpublished national input-output table was collated with 230 by 230 dimension. However, the published tables were of 59 by 59 dimension and an 11 by 11 dimension. In 1990 (updated table), the NSCB published again a 59 by 59 national input-output table with a smaller 11 by 11 sector.

In the Philippines, macromodelling has been mainly confined to the construction of computable general equilibrium models, each model aimed at answering specific policy questions. Three widely acknowledged CGEs were the models devised by Habito in 1984, Clarete in 1985 and Bautista in 1987.

Paderanga and Danao undertook modeling of the regional economy in the Philippines in 1988. Danao and Paderanga constructed a demand-determined regional econometric model and estimated it for Region 10. Later, in 1990, Danao created a supply-determined top-down econometric model for a Philippine region. He estimated, using dynamic historical simulation, and ex-post forecast of the models for region 7. The Danao model used Klein’s model and regional econometric modeling by Adams, Crow and Milne as take-off points. The major limitation of the Danao model, as mentioned in his paper (1990), was that important variables like regional exports and imports and migration were left out. A more complete econometric model would include incorporating a net migration sub model, which interacts with labor force, employment, population and wages. Danao has suggested future work incorporating an energy demand sub model, disaggregating investment in durable equipment into its public and private components and disaggregating taxes and respresifying the tax functions using appropriate tax bases and developing the local government sub model to make it more useful to local government officials.

An interregional input-output model (bi-regional model) for the National Capital Region and the rest of the Philippines was developed by Richardson, Yao and Jazayeri (1988). Analysis of impact multipliers showed that the interregional as opposed to the intraregional contribution to national multipliers were also small and the location of many industries in peripheral regions were efficient in generating larger multipliers. The paper explored the effects of alternative policy instruments in stimulating development in the peripheral regions; namely general infrastructure subsidies, labor subsidies, targeted primarily at small and medium-scale industries and policies aimed to change the internal terms of trade in favor of the agriculture sector. While most of the work in regional economic planning models has focused on identifying leading sectors and strong interindustry linkages, the Richardson, Yao and Jazayeri model focused on broad policy issues.

**Current status of Regional Input-Output Table creation in RP**

Most of the regional input-output tables constructed were for single regions. Single region I/O was created for Region XI (Southern Mindanao) by Orbeta, Cortez and Calera in 1997. The three estimated the impact of macroeconomic policies like trade and agro-industrial policies, local pump-priming programs and overall regional growth targets.

A single region I/O table was extracted by Dakila for the whole Mindanao economy from the Philippine national I/O for the years 1979, 1990 and 1994 using non-survey techniques like location quotient method and RAS. Identification of key sectors, based on selected I-O indicators, in the Mindanao economy and national economy was undertaken. The results of this study was presented in an I/O workshop on October 5, 1999 sponsored by the Philippine Institute for Development Studies and the National Statistical Coordination Board in ACCEED Conference Center in Makati City.

On the other hand, Secretario put a single region Metro Manila input-output table together in 1999 and he undertook a structural analysis of this single-region model under the auspices of the Japan Society for the Promotion of Science (JSPS). Then in 2000, a 2-region interregional I/O table for Metro Manila and the rest of the Philippines was created in 2000. Both single region and bi-regional I/O tables were expressed in 1994 prices. Currently, in 2001, Secretario is developing a 5-region input-output model. The Philippine multi-regional I/O table divides the entire country into 5 regions namely: NCR or Metro Manila, Northern Luzon, Southern Luzon, Visayas and Mindanao.

Although still in its initial stage of development in the Philippines, policymakers are starting to appreciate the usefulness of regional I/O tables for policy-making purposes.

**Advantages of interregional perspective over intraregional perspective in policy formulation**

An intra-regional perspective gives a static picture of regional economic structures at a particular point in time and space. The focus of the model is on local industrial structure and on the impact of exogenous changes in final demand on economic activities in the individual region. But single-region models have been criticized on the following grounds. These include (1) the lack of horizontal (multiregional or interregional) feedback and spillover effects especially in a dynamic spatial system, marked by strong interregional competition. (2) the lack of satisfactory theoretical basis for including supply effects in the form of specific locational or infrastructural components of a region, (3) the lack of a consistency of separate single-region models with respect to the national total system and (4) the lack of vertical feedback mechanisms between the national and the regional economy.

Another limitation of intraregional
I/O tables is that the impact of a given event on a defined region like the NCR implies that the event has no compensating significance beyond the defined region in question. This is true if the region under study has a high level of self-sufficiency as far as meeting regional domestic demand is concerned. Impact analysis would suffice if effects were represented simply as transactions usually as increases or decreases in gross domestic product. However, if a region was highly reliant on trade to meet its domestic needs, then the impact of an exogenous event on economic structure would be understated. Also, both the positive and negative effects of an exogenous event should be considered to get the net effect on the regional economy. Instances of expenditure switching with the occurrence of an exogenous event may occur as in local residents switching their expenses from other activities to current projects whose impact is being assessed.

On the other hand, an interregional I/O table measures and models interconnections among sectors in the regions studied. It focuses on linkage effects, spillover effects and feedback effects of exogenous changes in the economy among regions. Policymakers who need to make location decisions of production and consumption units appreciate the importance of measuring interregional spillover effects and interregional feedback effects. Furthermore, the interregional I/O can differentiate impact on target variables by region. It can for example, identify increase in employment in one region as a result of setting up a new industry in another. Another issue, which demands spatial analysis, is evenness of distribution of industrial and population centers across a country. Are industries scattered across the country in an optimal way? Are there a lot of rural migrants in the urban centers like Metro Manila? In which sectors are these migrants employed? And can the transport system in urban areas meet the increased demand created by rural-urban migration?

However, there are two basic limitations of the IRIO model as pointed out by Toyome. This concerns the rigidity of the assumptions on which the model is based. The first is the restrictive assumption of no spatial substitution. This means that cement produced in Mindanao is distinctly different from cement produced in Luzon. This implies a fixed supply pattern of cement, which the IRIO model assumes to remain stable over some extended period of time. The reasons for the Armitage assumption are multifold. The first is when perfect complementarity of imports to the national output is assumed, any given change in trade policy does not produce a large direct effect on the structure of the economy. This is because of the price insensitive behavior of intermediate and final users. But if perfect substitution between inputs is assumed, a small change in trade policy will produce a large direct effect on the structure of the economy. The insertion of imperfect substitution among inputs using the Armitage assumption restricts extreme demand responses as a result of trade policy change. Moreover, the presence of cross-hauling in trade data is accounted for once the Armitage assumption is adopted. The second limitation of the IRIO model is that the regional breakdown requires very detailed data which are not easy to collect.

Because of the severe data limitations of interregional input-output model, multiregional input/output models were developed, the most famous of which is the Chenery-Moses model. This model removes much of the data requirements in interregional I/O framework by decomposing the interregional technical coeffi-

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cient into two components: namely the regional technical coefficient and the trade coefficient and by making the assumption that all sectors in a region buy a given input commodity from regions in identical regional proportion or the trade coefficients of a given commodity are invariant within each region.

The MROI (Chenery-Moses) model using column coefficients to describe supply distribution was developed independently by Chenery (1953) and by Moses (1955), hence it is often called the Chenery-Moses model. To identify inputs' regional origin, the model assumes that it is the purchaser who decides the regional composition of each input. Thus, the bulk of given input is divided up among the selling regions; each assigned a fraction of it for supply. To simplify matters, the model further assumes that the regional composition of any given input is identical among all purchasers in a given region, irrespective of which industry they belong to. (This is called the identical regional supply pattern assumption.) Put differently, if a region, as a whole, purchases 10 percent of its needed amount of commodity i from region r, then each industry in region s will also import 10 percent of its inputs from region r. These intersectorally identical proportions are written as t

\[ t_i^r \]

is seen, this set of coefficients allocates input supply along a column of selling regions, hence column coefficients.

The output model of the MROI system is given by

\[ X_i = t_i^n a_{ij} x_j + t_i^n y_i \]

where \( y_i \) is final demand for commodity i in region s. Written in matrix form,

\[ x = T^* A^* x + T^* y \]

Similarly, the price model is -written as

\[ p = p^*_k A^* + v \]

Note that the product of a technical and a trade coefficient becomes the functional equivalent of a technical coefficient of the IRIO model:

\[ A_i^T \]

Since only regional totals are needed to calculate trade coefficients, this type of MROI model is free from the data burden imposed by the IRIO model. Another important advantage of this model is that by decomposing the IRIO technical coefficient into the two components, the model allows for separate treatment of technology and trade, which are presumably under the influence of different forces. This feature appears attractive especially in long-run simulation, where coefficients should be updated periodically.

Usage of Interregional Input-Output models for policy formulation

Industrial Promotion Policies - Before the creation of Regional Development Policy in 1988, most macroeconomic policies were biased in favor of Metro Manila or NCR. However, the development of NCR has spilled over adjacent regions like Region IV. Although government, through its entry into the World Trade Organization, has gradually introduced trade liberalization policies, the structure of protection remains biased against agriculture. The strong forward linkage of the agricultural sector to resource-based sectors in the industrial sector could be an argument for pursuing strong agricultural modernization and development policies.

Findings of recent studies show that despite the host of incentives offered to industries to locate in areas outside Metro Manila, most firms are still attracted to locate in NCR or its adjacent region where infrastructure support by government is highest. It has been discovered that the firms, which availed of special programs like export processing zone and industrial estates, have low backward and forward linkages with the rest of the Philippine economy. It could be that the incentives are not as attractive as the benefits derived by firms locating in NCR through transportation, communication, infrastructure systems provided by government.

With the passage of the Local Government Code in 1991, many powers were devolved to the local governments. Interregional I-O data can be used to analyze the effect of infrastructure projects located across the country based on a regional investment criteria set up by the country's planning agency.

Through interregional I-O analysis, the spatial impact of such policies as a subsidy for specific industrial sectors, infrastructure investment policies in response to need than potential, policies for uniform pricing of public services and tax policy, may be determined. I-O analysis can be used to verify whether these policies appear to be heavily biased in favor of the center core region.

Structural Analysis & Key Sector Identification

The 2-region input-output table for 1994 created by Secretario in 2000 could provide useful insights about the inter-relationship between the economic structure of Metro Manila or NCR and the rest of the Philippines.

Interregional input-output data revealed the following results: as far as inter-regional, intersectoral linkages are concerned, the NCR sector which had the highest total linkage was the manufacturing sector (2.7953); followed by the private services sector (2.251) and then by the transportation, storage and communication sector (2.1080). This means that location of manufacturing firms in Metro Manila would have strong feedback and spillover effects on the rest of the Philippines.

Interesting insights on the degree of
self-sufficiency of specific sectors in Metro Manila vis-à-vis the rest of the Philippines may be gleaned from Secretario's 2 region I/O data. It is interesting that the services sector exhibited the highest degree of self-sufficiency which reinforces the center-periphery model of development. This also implies the impact of influx of rural-urban migrants into Metro Manila who provide the mass base for urban employment. Indeed, this proves that until the early 90s, Metro Manila has been the center of infrastructure development as evidenced by the high self-sufficiency rate of the transportation, communication and storage sector (144.21%), and private services (145.10%). The more than adequate supply of financing services is manifested by its self-sufficiency rate of (126.34%). Indeed, Metro Manila can be considered one enclave with all the necessary support services for economic growth concentrated in this region. It is also important to note, however, that the utilities sector outside Metro Manila, which is the electricity, gas and water sector exhibited the highest self-sufficiency rate for the rest of the Philippine economy.

Looking now at the intersectoral effects of changes in final demand, if the stimulus comes from within the NCR, the paper found out that it is export expenditures which generated the largest output multiplier effect (1.5086). This means that the interregional flow of goods had the greatest stimulative effect on regional output. This ties up with the manufacturing sector having the highest total linkage effect in the Metro Manila economy. Investment expenditure had the lowest intraregional multiplier effect (.8218). Surprisingly, if the stimulus came from exogenous expenditures outside NCR, export had the largest output multiplier effect (.5722) and investment expenditure had the lowest inter-regional multiplier effect (.1054). This finding underscores the extreme reliance of the Metro Manila economy on trade with the rest of the Philippines and the rest of the world to enhance its productivity levels.

Input-output applications have been used in studying the effects of changes in population levels and structure upon the regional economy and vice-versa. This has lead to the creation of extended I/O models which attempt to capture the impact of migration on interindustry structure.

However, there are important limitations of the bi-regional model. Using the following methodology may enhance the reliability of commodity flow data. It is suggested that further elaboration on the derivation of domestic imports of National Capital Region and the Rest of the Philippines be undertaken. Then these may be compared with national imports from the rest of the world. A second area, which can be explored, is to look into the self-sufficiency capability of NCR. A high self-sufficiency ratio would enhance the insights gained from intraregional I/O table. However, high level of dependence on outside regions and the rest-of-the-world, as manifested by low self-sufficiency ratio would enhance the credibility of interregional trade flow data. In this relation, the high self-sufficiency ratio of the agricultural sector in a highly urbanized region as the NCR needs to be explained. Moreover, the application of LQ method for NCR-ROP data and ROP-NCR data needs to be rationalized. This is the essence of interregional flows - as in garments exported from NCR to ROP are different from garments imported from ROP-NCR. How does the LQ method create a differentiation between these two
trade flows? A third area of improvement in the theoretical framework is the distinction between intra-regional and inter-regional trade coefficients and the role of location quotient method as an adjustment mechanism for sectors with strong import orientation. A fourth area is that part of the limitation of the commodity flow data is that it fails to consider the phenomenon of cross-hauling. Intra-NCR trade does not include land-based commodity flow data.

In terms of the effect of changes in final demand on gross value-added, consumption expenditures (.8163) had the largest income generating effect, followed by foreign exports (.7294) and investment had the lowest income multiplier effect for NCR (.3796). The importance of the household sector and the trade sector in Metro Manila can be deduced from these findings.

Given the structural features of the economy, key sectors may be identified based on present criteria by economic planner as in total linkage effects, high productivity rate, high degree of interconnectedness, high gross value-added per intermediate input, and high multiplier effects.

**Migration Studies**

Input-output applications have been used in studying the effects of changes in population levels and structure upon the regional economy and vice-versa. Another area of socio-economic analysis is the interactive effects of income status and economic activity. This has lead to the creation of extended I-O models which attempt to capture the impact of migration on interindustry structure.

Essentially, migration studies attempt to link households to the economic system. The impact of migration on regional structure is assessed via the consumption effects of different households immigrating into the region. In a study by Van Dijk et al. (1984), the regional impact of in-migration was examined and linked with the I-O model and a labor force vacancy chain model. The consumption effects of different households in-migrating into the region were considered. It was assumed that the regional system experienced five changes in demand, only one of which was exogenously determined, namely the consumption demand of immigrants.

The other changes in demand were the changes in regional intermediate demand and consumption-induced effects. For example, the change in production levels was shown to be dependent on the region's consumption vector of people with high labor incomes, the consumption of those receiving unemployment benefits and the consumption of those with non-labor force active benefits. Then the vacancy chain model provided the link between employment creation and changes in output. Changes in output were created by the expenditures of the immigrants and increases in their labor productivity. Total number of vacancies was determined by multiplying industry probability matrix of people leaving industry to take up jobs in industry j; v vector is a miscellaneous category comprising of movements out of a region, out of labor force because of retirement and as a result of frictional vacancies. In addition to transfers among industries by those already employed, other vacancies are filled by the unemployed who enjoyed benefits, nonactives who enjoyed nonactive benefits or no benefits and immigrants from other regions.

**Environment-Related Studies**

Many studies have extended the I-O framework to account for environmental pollution generation and abatement in connection with interindustry activities. Economic-ecologic models extend the interindustry framework to include ecosystem sectors by creating an ecosystem submatrix linked to an interindustry economic flows matrix in the same manner that regions are interconnected in an interregional I-O model. Among the first applications of economic-ecologic models were those of Daly (1968), Isard (1968) and Victor (1972). Generalized I-O models are formed by augmenting the technical coefficients matrix X with additional rows and columns, reflecting pollution generation and abatement activities. Direct pollution coefficients (indicating the amount of each pollutant) are assumed to be linearly associated with output, that is, being a function of final demand.

The pioneers in these environment-augmented I-Os were Leontief, (1970), Leontief and Ford (1972) and Cumberland (1971). Leontief augmented the technical coefficients matrix with a set of pollution generation coefficients, which reflect the amount of a particular pollutant generated per unit of output of a sector, and a set of abatement coefficients, which indicate inputs to pollution elimination activities. The conventional I-O matrix was augmented by a pollution matrix or a direct impact coefficients matrix = [Pij]. Each element of the direct pollution coefficient matrix indicates the amount of pollutant generated per billion worth of industry j's output. The usual types of pollutants used are particulates, sulfur oxide, hydrocarbons, carbon oxide and nitrogen oxide.

Coupe in 1977 devised techniques, which used Leontief's 1970 matrix. His non-survey technique computes pollution coefficients on the basis of arithmetic means of pollution coefficients of U.S. data. Hence, this would be useful for developed economies whose structure is similar to that of the U.S. To get the entire pollution effect, the Leontief inverse is post-multiplied with direct pollution coefficients where the T is the total pollution matrix composed of coefficients t, which indicate the direct and indirect amount of the k type of pollution generated by the activities of sector j to deliver a unit of output to final demand.

\[ T = P * [I - A]^{-1} \]

Environmental impact analysis may also be undertaken using pollution trade-off multipliers (output, income and employment) Output trade-off multipliers are given by summing the rows of the total pollution matrix. Other multipliers
like the pollution income trade off multipliers which are estimated by multiplying the total pollution matrix with the diagonalized inverse matrix of conventional income multipliers may also be derived from environment-augmented I-O. Likewise, the employment pollution trade-off multipliers could also be generated by multiplying the total pollution matrix with a diagonalized inverse of sectoral multipliers.

Carlos (2001) undertook a critical review of the environment-augmented I-O studies in her recent paper. The ENRAP framework, which created adjustments for the environment in the IO table, was presented. Among the significant findings of the ENRAP study by Mendoza et al. was that (1) household sector accounts for 43% of air pollution and 33% of air pollution; (2) agricultural and forestry sectors have the highest total pollution damage and natural resource depreciation multipliers; and (3) air pollution damage is very high compared to natural resource depletion, environmental services and water pollution damages.

Conclusion

The foregoing discussion underscores the usefulness of interregional I-O model in defining possible policy directions. They provide analytical tools for defining the spatial thrust of any regional economic development policy. The common thread among all the four areas defined as possible areas of regional economic growth is that they are intertwined with the phenomenon of urbanization. Correlates of urbanization include in-migration of people to cities and environmental degradation. Moreover, the determination of the strength of interlinkage in the form of spillover and feedback effects of adjacent regions can be determined through a thorough analysis of economic regional structure. And lastly, the so-called geographical distribution of development can be more equitable and efficient if industrial promotion policies consider the spatial relationship among production and consumption agents located in center and periphery areas.

Bibliography


