Microeconomics of Globalization:

Evidence from Mexico, China, El Salvador, and the Galapagos Islands

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The Microeconomics of Globalization:
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Globalization—the integration of people with world markets—is perhaps the most significant and pervasive economic development of the late 20th and early 21st Centuries. It is the subject of a small but growing body of empirical economic research at the national and multi-national levels.[1] However, economists have paid little attention to the ramifications of globalization for micro-regions and the households, firms, and household-firms within them. This is surprising, because the impacts of globalization on nations and even groups of nations are shaped by the actions of economic actors, whose incentives and constraints are altered by their insertion, directly or indirectly, into the global economy, as well as by the economic environments in which they live. Attempting to understand the implications of globalization for poverty and inequality, including regional disparities within nations, requires a more micro approach than that which has characterized most economic research in this area.

Insertion into the global economy takes many different forms. As economic integration unfolds, producers become inserted directly into global markets on the output side, through production of exports, and/or on the input side, through imported intermediate inputs, technologies, or factors. Migration is the principal mechanism by which households in less developed countries (LDCs), especially in rural areas, become directly inserted into the global economy. What this paper calls the "microeconomics of globalization" refers also to the myriad ways in which economic actors also may become inserted into the global economy indirectly, through their relations with other economic agents within local, regional, and national markets.

Aggregate economic models tend to obscure micro responses to, and impacts of, globalization. For example, studies using multi-nation computable general equilibrium (CGE) models predicted that economic integration through the North American Free Trade Agreement (NAFTA) would decrease rural employment and wages and sharply increase out-migration from rural Mexico, with most migrants going to the United States.[2] The predicted surge in migration did not materialize after NAFTA's implementation, however. Findings from micro-regional models of NAFTA's impacts, by contrast, predicted small or negligible impacts of NAFTA on migration and rural incomes.[3] They highlight diversification in Mexico's small-farm economies and endogenous local input and output prices created by high transaction costs in rural areas, both of which are missed by aggregate models. Diversification and transaction costs buffer local economies from policy and market changes, muting—and in some cases reversing—the expected impacts of NAFTA (and other exogenous—e.g., policy, market,

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[1] For example, see Hinojosa-Ojeda and Robinson, 1992; Levy and van Wijnbergen, 1992; Golden, Knudsen and van der Mensbrugghe, 1993; Lee and Roland-Holst, 1996.

[2] Hinojosa-Ojeda and Robinson, Levy and van Wijnbergen; Cornelius and Martin.

[3] See Taylor, Yunez, and Dyer, 1999.

or environmental—shocks) on local production and incomes. Understanding the impacts of NAFTA clearly requires a locally textured approach not available in aggregate models.

Comprehending the ways in which individuals, households, and communities become inserted into global markets requires extending research on economic integration in new directions. In economics research, globalization means trade integration. Surprisingly little empirical economics research has been carried out on the ramifications of trade integration for participating countries. The few studies that have been carried out, like the trade literature in general, have a decidedly aggregate or "macro" focus (e.g., see Grinols and Wong's (1991) method to decompose the welfare effects of customs unions). A number of studies use computable general-equilibrium modeling techniques to explore the impacts of trade integration on various production sectors (Scollay and Gilbert, 2000; Yúnez-Naude and Hinojosa-Ojeda, 2000; Hinojosa-Ojeda and Robinson, 1996; Levy and van Wijnbergen, 1996; Golden, Knudsen and van der Mensbrugghe, 1993; Lee and Roland-Holst, 1996). However, intra-national studies of how regions and economic actors within them are affected by global economic changes, including trade reforms, are notably absent from the applied economics literature on economic integration.

Relations among economic actors within nations diffuse the impacts of globalization while inserting a widening circle of individuals, households, and producers into the global economy. Market structures, in turn, govern relations among actors. As market liberalization and trade integration climb to the top of the economic policy agenda in many countries, development economists increasingly focus their attention on market imperfections that may inhibit trade and create welfare losses. It is now generally accepted that government interventions, including import-substitution policies, may distort market incentives and inhibit broad-based income growth; however, market liberalization and trade integration do not necessarily improve welfare when market imperfections exist. During the past 15 years, economic research has addressed imperfections in a diversity of markets, including credit, insurance, and information (Carter, 1988; Morduch, 1995; Brandt and Hosios, 1996; Townsend, 1995; Udry, 1994; Eswaren and Kotwal, 1985; Besley, 1995; Otsuka, K., H. Chuma, and Y. Hayami, 1992); and labor and output (de Janvry, Fafchamps and Sadoulet, 1991). (See also the general perspectives by Bardhan (1988) and Stiglitz (1989, 1988).) Local market structures shape the ways in which globalization gets played out at the local level. They may facilitate or impede local agents' integration with outside markets, interactions among actors within local economies, and ultimately, the local impacts of global market integration.

A basic premise of the present paper is that we need to go beyond the traditional trade focus on nations as well as a microeconomic focus on individuals, households, and firms to understand how globalization unfolds. A focus on nations misses the microeconomic story of how economic agents become integrated with global markets through trade. However, economic agents—individuals, households, and firms—are part of larger social groups. Agents directly linked with global markets connect others with the global economy, through their transactions within local and regional markets. Firms

supplying intermediate inputs or households supplying factors to export producers become inserted into world markets indirectly. Non-migrant households, through their interactions with migrant households (or with other nonmigrant households that interact with migrant households) are also indirectly connected with the global economy. Recent migration research raises the possibility that most of the impacts of migration and remittances on source economies may lie outside the households that send migrants and receive remittances from abroad.

This paper proposes a methodology to explore the microeconomic ramifications of globalization, both direct and indirect, in LDCs. It illustrates this methodology by examining aspects globalization in four diverse economic and social settings: China, Mexico, a former conflict zone in El Salvador, and Ecuador's Galapagos Islands. The empirical findings, using "micro-economywide" modeling techniques, illustrate both the complexity and the diversity of influences of globalization at the local or regional level. In the case of China, rural households and communities are integrated with the global economy through internal migration to expanding global cities. In Mexico, changes in agricultural policies mandated by North American trade integration alter production and work incentives and reshape village and town economies. International migration from a former conflict zone in El Salvador creates a regional economy linked to the United States via flows of people and money. In the Galapagos Islands of Ecuador, virtually every aspect of the local economy is linked to a non-labor export, tourism, which drives local economic growth and brings new individuals into contact with global markets, through internal migration (possibly at the expense of the local ecology). All of these case studies illustrate how new modeling techniques permit the analysis of influences previously overlooked by trade and microeconomic research.

Part I proposes the use of a "micro economywide" modeling approach to explore the likely impacts of globalization on local economies as they become increasingly integrated with world markets. It introduces the concept of "paths of insertion" as a prelude for modeling households', firms', and regions' incorporation into the global economy and the impacts of globalization. The example of migration in China is used to illustrate microeconomic impacts of globalization on economic actors. The manner in which economic agents become incorporated into the global economy is complex, and understanding them requires analytical tools that go beyond the traditional microeconomic focus on individual actors like households, firms, and household-farms. Paths of insertion may be direct or indirect, and some regions may be isolated from global markets even in nations that imagine themselves to be on the path towards globalization. Transaction costs separating economic agents from outside markets play a critical role in governing the terms of engagement with the global economy. Part 2 summarizes research findings using micro-economywide models for Mexico, El Salvador, and the Galapagos Islands. Implications for development economic research and policy are discussed in Part 3.

1
Insertion of Households and Communities into the Global Economy

Intra-nation studies of how regions and economic actors within them are affected by global economic changes are notably absent from the applied economics literature on economic integration and globalization. There are three major direct paths of insertion, or mechanisms by which economic actors in LDCs may be integrated into world markets: output markets, or the sale of the goods produced by households and firms; expenditures, or the purchase of intermediate inputs and consumption goods; and factor markets.

Examples of direct insertion include the sale of output directly abroad (e.g., a Mexican farmer who markets her produce in the United States, or a Galapagos Island restaurant catering to foreign tourists), the purchase of inputs or consumption goods from abroad (e.g., a Mexicali family that uses a border-crossing card to shop in California), or the supply of factors to households or businesses abroad (the village household that sends labor and human capital to the United States, through migration). The most frequent direct path of insertion into global markets for people in rural LDC settings is through factor markets, primarily migration.

Migration and the Transformation of Household Economies in Rural China

With more than 75 million migrants, China is experiencing the largest flow of labor out of agriculture ever witnessed in world history (Solinger, 1999; Rozelle et al., 1999). The role of migration in economic growth is perhaps most evident in China's global cities, where a construction workforce comprised largely of migrants is transforming urban skylines. Migration transforms China's rural household economies, as well. Family members who remain behind in the village (e.g., parents and siblings) reorganize consumption and production activities in the wake of the migrant's departure, and migrants typically share part of their earnings with their household of origin, through remittances. Continuing interactions between migrants and rural households suggest that a household model would be more appropriate than an individual-level (e.g., Todaro) model of migration decisions. Indeed, in individual-focused migration models, there is no rationale for migrants to share their earnings with the place of origin; we are left with the puzzle of why geographically extended families are prevalent in LDCs but less so in high-income countries (Rosenzweig, 1988) and few insights into the likely impacts of migration and remittances on rural economies.

In the new economics of labor migration (NELM; see Stark, 1991 and Stark and Bloom, 1985) view, migration decisions are not entirely the domain of individuals. They take place within a larger context—typically the household, which potentially consists of individuals with diverse preferences and differential access to income—and they are influenced by the social milieu. The perspective that migration decisions are not taken by isolated actors but by larger units of related people, typically households or families, is a trademark of the NELM. So is the contention that people act collectively not only to

maximize income, but also to minimize risks and loosen constraints created by a variety of rural market imperfections, including missing or incomplete capital, insurance, and labor markets.

Migrants may play the role of financial intermediary, providing their households with liquidity (in the form of remittances) and with income insurance (the promise to remit if misfortune strikes: a crop fails, a family member becomes ill, etc.) Mutual altruism reinforces this implicit contract. So do inheritance motives (i.e., non-remitting migrants stand to loose their rural inheritance) and migrants' aversion to risk, which encourages them to uphold their end of the contract in order to be supported by the rural household should they experience an income shock (e.g., unemployment) or other misfortune in the future.

In the standard neoclassical household-farm model, migrant remittances are simply an income transfer. They affect consumption, by shifting the budget constraint outward. However, they do not affect production, because an income transfer leaves the conditions for farm profit maximization unchanged. However, in an NELM model, market imperfections result in household-specific "shadow prices" that transmit remittance impacts to the production side of the household-farm economy. As a result, the economies of households with migrants are transformed.

Table 1 presents findings from a recent study of migration from rural Chinese households that tests some basic tenets of the NELM (De Brauw, Taylor, and Rozelle, 2000). Migration from these households is driven by globalization, as villagers move to expanding global cities in eastern China. Using simultaneous-equation econometric techniques and household survey data from China, we tested the NELM hypothesis that migrant remittances promote investment in production activities (by loosening credit and risk constraints) in households with migrants. We also tested the hypothesis that imperfect rural labor markets create negative "lost labor" effects of migration on production, as households are unable to substitute hired workers for those who migrate.

The findings summarized in Table 1 show that, in almost all household production activities, the loss of labor to migration reduces net income. Self-employment income is especially negatively affected; it falls by an estimated 7167 yuan (just under US$900) per migrant. However, migrants generate remittances, and remittances, in turn, significantly increase net incomes in both farm and self-employment activities. The positive impacts of remittances on production are large: nearly 3 yuan of net farm income and more than 4 yuan of self-employment income per yuan remitted. Taking into account both the negative lost-labor effect and the positive remittance effect, migration sharply increases per-capita income in households that engage only in crop production, and it has generally positive but complex effects on households with income from both farm production and self employment. Rozelle, Taylor and deBrauw (1999) found a similar pattern of negative lost labor and positive remittance effects on maize production in households in northern China. Maize production fell by 462 jin per mu when households "lost" a

family member to migration, other things being equal; however, it increased by .44 jin per mu for every yuan (US$.12) of remittances.[4]

These results from China mirror findings from studies of impacts of migration in South Africa (Lucas, 1987) and Mexico (Taylor, 1992). However, a limitation of all of these studies is that they focus only on households with migrants. They illustrate ways in which globalization may reshape migrant household economies; however, they do not offer insights into how migration by some households may integrate local economies, of which these households are part, with the global economy. As some economic agents become inserted into global markets directly, via migration or other means, other economic actors and the activities in which they engage may be inserted into the global economy indirectly, in myriad ways.

Towards a New Microeconomics of Globalization

In contrast to the nation focus of market integration research, microeconomic studies of the impacts of policy or market shocks overwhelmingly focus on the economic actors (e.g., households) who are directly affected by these shocks, e.g., in the example from China, on the households with migrants. However, these economic actors are part of larger, village, regional and national economies. Their economic interactions within these economies project the impacts of globalization beyond the directly affected agent.

Returning to the China example, if a migrant household uses remittances from international migration to finance a new project in the village, it may demand labor from another village household. If the migrant household did not insert itself into a foreign labor market through migration, it would not invest in the project, and the other household would not have a market for its labor (or other goods or services) in the village. Investing may not be limited to the migrant household, if there is some kind of local credit market to channel savings among households; in that case, a household that does not have a migrant could borrow from a household that obtains capital from migrant remittances. In these examples, non-migrant households become inserted into the global economy indirectly, through their economic relations with migrant households. That is, one economic actor's direct engagement with global markets transforms the production activities of other actors, as both the migrant household and households around it "reinvent" themselves around migration.

Paths of insertion may be very indirect. For example, China's increasing integration with global markets leads to a construction boom in Shanghai, in which migrants from rural Jiangsu households supply labor, or to new export-producing township factory, in which local villagers are employed. Rising incomes linked directly or indirectly to these activities increase the demand for fish raised in paddies-turned-fish-ponds in the Yangtze delta. The fish-raising village household is inserted into global markets, in the sense that its activities have been reshaped by economic growth induced

[4] 1 jin is roughly equal to 1/2 kilogram and 1 hectare is 15 mu.

by globalization. To complete the circle, the new fish production may also be financed, directly or indirectly, by migrant remittances or township-factory wages.

Many or possibly most of the impacts of globalization within nations may lie outside of the households or activities that are directly linked to the global economy. A micro focus on households or firms misses the diversity of market linkages that transmit the impacts of globalization through local, regional, and national economies. Demand linkages create income multipliers and diffuse the impacts of globalization from directly affected agents to others in the local economy, and ultimately, to regional commercial centers.

Contact with global markets may unleash a variety of other general-equilibrium effects on local and regional economies. For example, if the loss of labor to migration or new production stimulated by contact with global markets drives up local wages, economies may restructure themselves around labor scarcity, shifting to less labor-intensive (and more capital-intensive) activities and production technologies. An ever-widening circle of economic actors then becomes inserted into the global economy indirectly, even if they do not engage directly in trade outside their country's borders.

In each of the examples above, access to markets is the key to economic insertion, direct or indirect, into the global economy. Access to a foreign market for goods or factors is a prerequisite for direct insertion, while access to regional or local markets that are linked in some way (perhaps very indirectly) to global markets is a *sine qua non* for indirect insertion. The existence of markets creates the possibility for linkages to transmit impacts of foreign-market integration to local actors. High transaction costs in local markets do the opposite. For example, high costs of transacting in product markets limit the ability of households to market their output or obtain inputs. High costs of migrating—due to lack of information, etc.—inhibit some households from sending migrants abroad or to domestic urban centers. Moral hazard and monitoring costs may inhibit the emergence of efficient local labor markets linking labor-demanding and labor-supplying households. Missing or incomplete credit markets prevent capital from being channeled to its most efficient uses in rural areas and constrain rural households to self-finance investments—or, if capital is too scarce, to not invest at all.

Imperfections in rural commodity and factor markets may affect economic actors' integration with global markets negatively in some cases, positively in others. For example, high transaction costs in markets for goods or labor limit the possibilities for direct insertion of rural households into the global economy through trade or migration—even if a country is part of a free-trade area. High transaction costs in this case inhibit trade, much as restrictive trade policies would. On the other hand, lack of access to local credit that constrains household production may encourage households to seek new income sources, e.g., wage work off the farm or migration. Capital market imperfections that impede household-farm production may result in "too much" off-farm labor supply or migration—in other words, excessive insertion into foreign or domestic-urban labor markets, as labor moves from more to less capital constrained sectors.

The structure of local and regional markets is outside the purview of existing applied models of trade integration. However, its importance is recognized by some micro-economic studies of household-farm economies (de Janvry, Fafchamps, and Sadoulet, 1991; Strauss, 1986; Rozelle, Taylor, and de Brauw, 1999), which explore household behavior in the absence of selected markets. Recently, a nascent body of research has begun to explore local impacts of policy changes using "micro" economy-wide modeling techniques (Taylor, Yúnez-Naude, and Dyer, 1998; Taylor and Adelman, 1996). These studies take into account the ways in which agricultural households and firms interact in local markets, even when high transaction costs may isolate them from larger, regional and global markets.

Within countries, there are winners and losers from insertion into the global economy. This is certainly true among individual economic actors, but it also may be true among sectors and even regions within countries. In general, reducing barriers to engagement with the global economy adversely affects actors involved in activities that were protected by those barriers. High transaction costs in rural markets, like restrictive trade policies, may benefit some economic actors, i.e., those who are efficient at producing for the "protected" local market. Insertion into the global economy, whether through policy reforms or a reduction in transaction costs, will adversely affect such agents, unless they are able to reorient their activities towards supplying goods or services to outside markets.

For example, in a village where high transaction costs isolate households from low prices in regional grain markets, efficient producers capture rents by producing for local demand. If the country joins a customs union and begins importing cheap grain from abroad, this may have little or no impact on "protected" prices in the village. Selective insertion into global markets (e.g., through off-farm labor supply or migration) that increases incomes in some village households may increase the demand for grain—for human consumption, feed for livestock purchased with remittances, etc. High transaction costs in this case transmit benefits from remittances to grain producers in the village. Lowering transaction costs in grain markets would do the opposite, dissipating rents to local grain producers by making the low regional grain price accessible to village households.

Understanding direct and indirect paths of insertion into the global economy requires an approach that (a) has a micro, rather than macro (national or multi-national) focus, (b) goes beyond the traditional household, firm, or household-firm focus to include the complex market linkages that connect economic actors within the economies of which they are part as well as with the outside world, and (c) elucidates the influence of market structures governing economic interactions and thereby shaping local actors' insertion into the global economy. Part 2 presents a micro economy-wide modeling approach designed to achieve (a) through (c). This approach is utilized to explore empirically the paths by which economic actors may be inserted into the global economy.

2
A Micro Economy-wide Modeling Approach

Understanding intra-national impacts of globalization requires modeling micro responses, the complex linkages among economic agents within local economies, and the linkages between local economies and the outside world (the rest of the country and abroad). Most economic research on rural economies entails the microeconomic modeling of individual agents' economic behavior, in most cases the behavior of agricultural households. However, that approach misses the linkages among economic agents that indirectly integrate rural people into global markets.

Village or "micro economywide" models make it possible to include linkages among households in an analysis of impacts of globalization and migration on migrant-source economies. Micro-economywide models occupy a middle ground between household-farm models and aggregate (national) trade models for the analysis of globalization. Like household-farm models, they are rooted in the micro economy and constructed "from the bottom up," using micro survey data. However, they integrate models of household, firm, and household-farm activity into a local (e.g., village or regional) general-equilibrium framework. This makes it possible to capture complex linkages and general-equilibrium feedback among economic actors that shape the effects of globalization on local economies.

Simulations using micro-economywide models are unique in their ground-level view of the likely impacts of exogenous policy and market changes on local economies, which is critical for understanding globalization's impacts and designing rural development policies. Village or micro economywide models are described in detail in Taylor and Adelman (1996) and Taylor (1995).

Figure 1 illustrates paths of influence of globalization on micro economies, through which local economic actors become inserted, directly or indirectly, into the global economy. Box A represents the mechanism by which some economic actors (e.g., households or firms) are directly inserted into global markets; e.g., by selling goods or services (including labor services) abroad. Through contact with the global economy, the production activities, incomes, and expenditures of these economic agents (e.g., the migrant households in rural China, discussed above) change. Interactions with other agents in the local or regional economy, through markets for labor, output or inputs, credit, etc., begin to transform those agents' economic activities, as well (B). That is, they connect new agents to the global economy indirectly. Those agents, in turn, interact with still others in the local economy (C). An ever-widening circle of economic agents becomes connected with global markets as these influences swirl around inside the local economy. Trade transmits part of the influence of globalization to outside (i.e., regional, national, or even international) markets. Micro economywide models can be designed to capture all of these linkages.

The rest of this paper presents the results of micro economy-wide (computable general equilibrium) models that were used to explore the impacts of trade-induced policy changes on economies in rural Mexico, the impacts of exchange rates (via international migration) on a former conflict zone in El Salvador, and the impacts of non-labor exports (nature tourism) on the economy of Ecuador's Galapagos Islands. All of these models were estimated using original survey data.[5]

NAFTA, Price Reforms, and the Rural Mexican Economy: Do "Decoupling" Schemes Really Decouple?

The North American Free Trade Agreement (NAFTA) calls for a gradual (15-year) phase-out of price supports for staples. Studies using aggregate CGE models concluded that a reduction in the government support price of corn would decrease rural incomes, employment and wages and stimulate a sharp increase in rural out-migration (Hinojosa-Ojeda and Robinson, Levy and van Wijnbergen; Cornelius and Martin). These negative impacts of agricultural policy reforms have not materialized. Despite an 18-percent real drop in the support price for white corn between 1994 and 1997, corn output declined only slightly, from 18.13 to 18.02 million metric tons (Mexican Ministry of Agriculture). There is no evidence that rural workers suffered disproportionately from structural reforms in Mexico, nor that Mexico-to-U.S. migration increased above its (rising) trend of recent years.

Under the PROCAMPO policy, initiated in 1994-95, output price supports were replaced by direct income payments to maize farmers. This is illustrated in Figure 2. As the share of price supports in total value of maize production fell, from 49 percent in 1992-93 to 19 percent in 1998-99, the share of direct income transfers increased, from 0 to 21 percent. PROCAMPO was designed as a "decoupling" scheme. That is, it replaced a high government-guaranteed price for maize, which distorted production incentives and encouraged "too much" maize production, with income transfers that, in theory, should not affect production decisions. However, income payments to farmers are "decoupled" from production only if perfect and complete markets exist for maize output and inputs. Decoupling is likely to break down in the imperfect market environments characterizing rural Mexico. The PROCAMPO policy experiment results presented below illustrate conditions under which PROCAMPO payments influence maize production, offering an explanation for the small observed effect of agricultural policy changes on maize production in Mexico as well as on rural incomes, employment, and migration.

The Mexico village-town model captures two critical aspects of the rural Mexican economy that are absent from aggregate NAFTA models: diversification in household

[5] The Mexico model and survey are described in Taylor, Yúnez-Naude and Hampton (1999) and Taylor, Yúnez-Naude and Dyer (1999). The El Salvador model and survey are described in Taylor, Zabin and Eckhoff (1999). The survey and background for the Galapagos study are described in Taylor, Yúnez-Naude, et al. (1999).

income activities and local market imperfections that alter, and in some cases may even reverse, the expected impacts of policy changes on local economies.

The model was estimated using data from a 1993 survey of 196 households in the central Mexican state of Michoacán. The sample includes 53 households in a town or county seat and 143 in the surrounding villages that, together with the town, make up the municipio (analogous to a U.S. county). Most land in the surveyed households is ejido (reform-sector) land. Total cultivated landholdings ranged from 0 to 19 hectares, with an average of 2.8 (0.4 for the 115 subsistence households and 6.3 for the 81 commercial, or marketed surplus-producing, households in the sample.)

The village-town model is really two models, one for the town and the other for the three villages. These two models are linked to each other spacially, through trade. Each model has 5 components: (1) household-farm production, (2) household-farm income, (3) expenditures, (4) a set of general equilibrium closure equations, which insure that local markets clear or else the village-town is a net buyer ("importer") from or seller ("exporter" of marketed surplus) to outside markets, and (5) a price-determination component, which sets village-town prices equal to outside market prices for tradables. For nontradables (i.e., goods or factors for which high transaction costs isolate the village-town from regional or national markets), local prices are endogenous "equilibrium" prices, at which local supply and demand are in balance.

The production component of the model requires putting values on family inputs and on output. This is not always straightforward in the imperfect market environments characterizing LDC rural areas. The Mexico survey took care to obtain information on inputs of all factors (land, family labor, hired labor, animal power, tractors and other physical capital) in crop and noncrop production, and also on prices whenever market exchanges took place. Market prices were usually observed for intermediate inputs. The chief exception was maize seed, which usually was selected from the previous year's harvest. We valued seed and crop output at their prevailing local market prices. Valuing hired labor and tractor services (most households did not own their own tractor) is straightforward, using market prices. Most families used their own animal power in production; however, in a few cases animal services were hired, and we used the observed prices to value all animal capital inputs. Subtracting the costs of intermediate inputs, hired labor, and mechanical and animal capital services from the gross value of production yields a residual representing family labor and land value-added. Ejido land could not be rented at the time of the survey; this resulted in what essentially was a missing land rental market, which means that land rents had to be imputed to obtain land value-added. One way to value family labor is to use the local wage. However, our experience in other parts of Mexico taught us that valuing family labor at the local wage frequently results in total costs exceeding gross revenue, suggesting that the true opportunity cost of family time is less than observed wages (workers usually are hired during periods of peak labor demand, when wages are highest). The alternative to using market wages is to impute family labor value-added (together with land rents) econometrically, from regressions of total (land plus family labor) value-added from

crops and livestock on land and family labor inputs. This is how we obtained family labor and land value-added shares to model household-farm production.

Household-farm savings and expenditures were estimated using a linear expenditure system (LES) approach and savings and expenditure data gathered in the survey.

In addition to value-added from production, many households received remittances from migrants in the United States (principally California) or from internal migrants (principally in Mexico City and Guadalajara). Aggregate CGE models assume that migration occurs until wages at the migrant origin and destination equilibrate (or that the disparity in wages remains the same before and after the policy shocks that the researchers simulate in their models). From a micro household-farm point of view, this is the wrong migration condition to impose. Households may allocate their members' labor either to local production (obtaining the value of the marginal contribution of the member's labor to local production) or else to migration (obtaining migrant remittances). We estimated remittance elasticities econometrically, from a regression of the log of households' migrant remittance receipts (net of amortized migration costs) for households that participated in migration on the log of their labor allocated to migration, controlling for family migration networks and correcting for potential sample selectivity bias. These elasticities were allowed to vary across household groups in the village-town model, reflecting differences among households in their access to foreign and domestic migrant labor markets (especially household "migration networks," or family contacts at prospective migrant destinations). The "migration equilibrium" condition in our model is that the value of the marginal product of family labor in the village-town equals the marginal effect of migration on remittance income (and the imputed family wage).

Incomes in the surveyed households are highly diversified (see Table 2). Most farmers surveyed engage in staple production on rain-fed lands: Just over half (52 percent) of all (village and town) households in the sample received income from staple production, including imputed income from subsistence production. Most of these staple-producing households also received income from several other sources, and staples accounted for only 6 percent of their total income. Forty-three percent of households received income from Mexico-to-U.S. migration, but the majority of households with remittances also received income from staple, cash-crop, and non-crop production.

The village-town model is described detail in Taylor, Yúnez-Naude, and Dyer (1999).

The Mexico model was used to explore the likely impacts of the PROCAMPO policy reforms on a rural economy under three alternative market scenarios. The policy experiments simulate the village-town economy-wide impacts of a 10-percent decrease in the support price for staples combined with a compensating lump-sum income transfer to staple producers, similar to what actually occurred under Mexico's PROCAMPO

program.[6] The three market specifications correspond to increasingly imperfect rural market conditions: (1) a perfect-markets specification, in which the village-town micro-economy is a price taker in all markets with the exception of capital and land (which are in fixed supply); (2) an endogenous wage scenario, in which wages are determined by the interplay of village-town labor supply, on one hand, and local labor demand and migration, on the other; and (3) endogenous village and town wages and staple prices.

The third scenario corresponds to a world in which costs of transacting in outside staple markets—including with government marketing agents—are high for village producers and consumers. In areas with high costs of transacting with outside grain markets, the local price of staples is likely to be endogenous, determined by the interplay of local supply and demand, not by the government guaranteed price. In our sample, a number of surplus-producing farmers sold their excess production locally, rather than selling to the government at the high guarantee price. When asked why, most responded that it was too costly to transport their harvest to the nearest government (CONASUPO) purchase point, approximately 40 miles away. Others cited cases in which neighbors had paid to transport their maize, only to have it rejected on the grounds that the quality was not sufficiently high or the silo was already full; this added marketing uncertainty, discouraging farmers from selling unless there was a sufficient price spread to cover not only transportation but also an implicit marketing risk premium. Some farmers complained that, lacking their own vehicles, they would have had to sell to intermediaries at a price below the guarantee price (reflecting the high transaction costs and marketing risks in this region).

The experiments presented here explore the impacts of PROCAMPO both in the short run (during which land cannot be shifted among production activities) and in the long run (when land is mobile across activities). Total land and capital are fixed in all scenarios.

Table 3 reports the results of the policy experiment for the three villages. The columns in the table correspond to the market scenarios and short versus long run; the rows, to village outcomes of interest.

The policy's direct effects on the village economy are twofold. First, lower staple prices induce households to shift production out of staples and into competing, nonstaple activities. Second, the PROCAMPO income transfer adds to the income of households receiving the subsidy, increasing their demand for normal goods (including staples and grain-fed livestock). However, economic linkages quickly transmit the impacts of the policy from the directly affected households to others inside and outside the village-town.

[6] Under the PROCAMPO "decoupling" scheme, payments were made on a per-hectare basis, an administratively necessary design when output is not known or information about output is asymmetric. In the policy experiment, farmers receive an income transfer equal to 10 percent of the base value of their staple production.

The results in the Table represent the total (direct plus indirect) effects of the policy in the villages.[7]

In all market-closure scenarios except (C), the combination of the price and PROCAMPO transfer effects sharply reduces staple output. Under Scenario A, the staple price falls and the income transfer has no effect on local production. This is the outcome that is assumed under decoupling; however, it depends upon the local maize market being integrated with outside markets, so that any increase in maize demand (stimulated by the transfer) can be met by purchasing grain outside the villages (or decreasing the part of marketed surplus sold in regional, as opposed to local, markets). In the short run, when land is immobile across agricultural and livestock activities, staple production falls by an estimated 8 percent. Livestock output increases slightly because feedgrain prices drop, but cash-crop and non-agricultural activities are unaffected, because they are not linked in any significant way to maize production.

When land is mobile, the decreased profitability of staples together with lower feedgrain prices provoke a reallocation of land towards livestock and other crops. Staple production falls by 26 percent, but the outputs of livestock and other crops increase by 3 to 4 percent. In this scenario, the fixed wage (implying an elastic supply of labor) insures that labor is readily available to sectors whose production increases. Migration is completely unaffected, as the fixed local wage leaves the condition for migration equilibrium (equating the local wage to marginal remittances) unchanged.

The aggregate CGE models cited earlier predicted an increase in migration because lower staple prices depress rural wages relative to wages at migrant destinations in Mexico and in the United States. If local wages adjust in response to the price liberalization and PROCAMPO policies (market scenario B), the expanding non-staple sectors actually absorb much of the labor released from staple production. Local wages are almost unaffected; they decrease by only 0.1 percent. In striking contrast to the aggregate CGE models, the effect of the policy change on migration is minimal, only 0.2 to 0.4 percent.

In market Scenarios A and B, lower staple production coupled with a positive income transfer effect on demand reduce the marketed surplus of staples outside the local economy. In Scenario C, however, high costs of transacting in outside staple markets buffer village producers and consumers from the government support-price change. Because of this, the negative effect of the change in government staple price in the villages is minimal. However, the PROCAMPO income transfer raises the incomes of staple-producing households benefiting from the subsidy.[8] This increases the demand for "normal" goods, including both staples and livestock that consume locally produced

[7] Results for the town appear in Taylor, Yúnez-Naude and Dyer, 1999.

[8] PROCAMPO payments depend only on past production; they are not contingent on sales. This means that even if high transaction costs discouraged sales and buffered producers from the price change, farmers could still be eligible to receive the income subsidy.

grain. The positive effect of the transfer on demand drives up the village staple price. There is a slight increase in staple production (by 0.4 to 0.7 percent)—exactly the opposite of what is predicted by aggregate CGE models. These small impacts of price changes on staple production are consistent with what actually transpired in Mexico. The decline in staple (corn and beans) production in Mexico was small and confined primarily to large commercial farms, not the small-farm sector where most of Mexico's producers are found and where most migration originates (SARH). In rural economies that were largely isolated from the price policy (i.e., distant from government purchase points), the agricultural reforms may, paradoxically, have had a small expansionary effect on staple production—or at least not significantly discouraged it.

Because of the diversification of rural household economies, the PROCAMPO income subsidy is never income-neutral, and in the case of imperfect local markets for staples or other goods, it is not truly "decoupled." In most cases, real incomes increase, as families benefit on the consumption side from the income transfer and lower staple prices and respond on the production side by shifting resources to other production activities. When high transaction costs buffer village households from outside staple markets, the PROCAMPO subsidy clearly affects staple production. Market Scenario C illustrates one of several ways in which the agricultural policy may fail to decouple: local prices link changes in consumption to production. Imperfections in other markets also may lead to a failure to decouple. For example, if small farmers cannot obtain capital from other means (e.g., banks), the PROCAMPO payments may provide investment funds that influence production of maize and other goods. If these payments are perceived as being relatively secure, they also may affect risk-related incentives to invest in local production. Capital market imperfections are only partially represented in the model used here, and the model does not consider production or income risk.

Migration, Remittances and Development in a Former Conflict Zone of El Salvador

Few developing countries are linked to the global economy as closely through migration as El Salvador. In 1998, remittances from Salvadorian migrants working abroad totaled US 1.34 billion, equivalent to 49 percent of total merchandise exports (International Monetary Fund, 1999). Migrant remittances provided El Salvador with not only income, but also precious foreign exchange and savings. Yet little is known about the roles that migration and remittances play in the country's rural economies. The El Salvador village-town model was designed to explore ways in which migration and remittances are transforming migrant-sending economies. Details of this model appear in Taylor, Zabin and Eckhoff (1999).

The original impetus for migration is important in shaping migration's impacts in local economies. In rural Mexico, where the motivation for migration is economic, interactions between migrant and nonmigrant households quickly transmit the impacts of migration and remittances through rural economies (Taylor and Adelman, 1996). In the municipality or cantón of Santa Elena, from which the data to estimate our El Salvador

village-town model originate, the initial impetus for international migration was political, as village and town residents fled to the United States to escape the ravages of civil war. The El Salvador study documents a continuing involvement of global migrants in the rural economy; however, limited interactions between migrant and non-migrant households restrict the diffusion of migration's impacts through the local economy.

The data to estimate this model are from an original survey of 200 households randomly selected from the town of Santa Elena and surrounding villages in the cantón of the same name. International migration rates in this zone are high. Thirty one percent of town households and 22 percent of village households reported having at least one migrant in the United States in 1993. Nationally, the Salvadorean government's 1991/92 national household survey found that 17 percent of Salvadorian households had migrants abroad. One half of Santa Elena's international migrants were in Los Angeles at the time of the survey.

International migrants link Santa Elena households directly to the global economy, and migrant remittances play a vital role in the local economy, constituting 36% percent of total income in migrant households. If Santa Elena were a nation, it would have a very open economy, and remittances from foreign migrants would provide most of the foreign exchange needed to purchase imports. Village-town "imports" of goods and services exceeded "exports" by 172 percent in 1994, the year covered by our survey. The resulting village-town "trade deficit" exceeded total value added in the local economy and was equivalent to 65 percent of total gross village-town product (the analogue to GNP). Santa Elena's trade deficit was financed almost entirely by migrant remittances.

Heavy reliance on dollar-denominated remittances makes this local economy sensitive to exchange rate fluctuations. In fact, other experiments (not reported here) found that incomes in this migrant-sending region are more sensitive to the exchange rate than to agricultural prices. Devaluations of the Salvadorian colón increase the value in local currency of each dollar remitted from the U.S., and it also makes international migration more profitable when viewed from the perspective of Santa Elena households.

The El Salvador policy experiments explore the short- and medium-run impacts of a 10-percent currency devaluation on the local economy. Because migrants are the only "export" for which households receive payment in dollars, this experiment is analogous to increasing the economic returns from migration (remittances) by 10 percent. In the short run, the devaluation stimulates incomes and encourages households to shift labor out of production and into migration. In the medium-to-long-run, however, remittances contribute to savings and investments, which in turn may increase local farm and nonfarm productivity.

Table 3 reports selected village-town impacts of the devaluation. Column 1 reports short-run impacts, highlighting tradeoffs between migration and local production. Column 2 presents medium-to-long run effects, including positive influences of remittances on local production, through investments by migrant and nonmigrant households.

The immediate effects of the currency devaluation are twofold: First, there is a transfer effect, as the value of remittances from migrants already abroad increases. This raises the incomes of migrant-sending households. Second, the increase in returns from migration in local currency leads families to allocate more labor to migration. In the short run (Column 1), the migration elasticity with respect to the devaluation is 1.3; that is, the 10-percent devaluation triggers a 1.3 percent increase in international migration. The devaluation redirects migrants from internal labor markets to the United States; internal migration falls by 14.3 percent (from a relatively small base).

Increased foreign migration drives up the family wage, or opportunity cost of family time, in the village-town by 5.4%. This adversely affects production. Agricultural output falls by 4.8 percent, and nonagricultural output declines by a similar percentage. Migration produces a "Dutch disease" effect on the village-town in the short run. Micro household-farm studies reveal a similar kind of lost-labor effect on migrant-sending (household) economies (Rozelle, et al., 1999; Lucas, 1985; Taylor, 1992). Village-town income increases (by 1.1 percent). However, the impacts of migration are very unevenly distributed across household groups. Income in migrant households increases by 6.5%. Nonmigrant households, on the other hand, are adversely affected by the migration-induced contraction in local production; their income falls by 2.4%. This finding reveals an unequal distribution of migration income across households, yet strong (in this case, negative) factor-market linkages among households in the local economy. It stands in contrast with findings from Mexico, where access to U.S. migrant labor markets and to the benefits of migration is more equally distributed across households.

Higher incomes stimulate village demand for manufactured goods "imported" from the rest of El Salvador, generating rural-urban growth linkages. They also stimulate local investment, which increases by 0.6%.

In the medium-to-long run, migrant remittances trigger investments that add to local capital stocks, raising the productivity of other (e.g., labor) factors in production. This produces positive dynamic effects of migration on local economies (Lucas, 1985; Taylor, 1991; Stark, 1980). Column 2 presents results of a two-period extension of the El Salvador model. In the second period, we see the positive of remittance-financed investments on local production, analogous to the micro impacts observed in the China household study cited earlier.

The positive investment effect of remittances dampens the negative lost-labor effect on local production. The effect of the devaluation on local production is still contractionary, but it is smaller. Agricultural output now falls by 3.3 percent (compared with 4.2 percent before). Nonagricultural output falls by 1.2 percent (compared with 1.8 percent). If we extended the simulation out several more years, the negative effects of migration would continue to dissipate. By providing village-town households with capital to invest, remittances stimulate production over time. This partially offsets the negative effect of lost labor on local production. The village-town income effect of migration is now larger—1.9 percent. More importantly, the negative effect of migration on nonmigrant family incomes is smaller (-1.16 percent). These findings are consistent with econometric findings that

migration generates negative lost-labor effects on migrant-sending households in the short run but positive investment effects in the long run (Rozelle, et al., 1999; Lucas, 1987; Taylor, 1992). However, our modeling reveals that linkages among households are critical in shaping the impacts of migration on migrant-sending economies—including on nonmigrant households. These linkages are outside the domain of microeconomic agricultural-household studies. Our findings also point to the importance of local markets, especially capital markets, to enhance the investment and development potential of migrant remittances.

Indirect Insertion into Global Markets: Migration and Tourism in the Galapagos

Ecuador's Galapagos Islands are a magnet both for tourists, mostly from abroad, and workers, mostly from mainland Ecuador, to support the island tourist economy. According to census data, the population of the Galapagos Islands increased at an annual rate of 5.9 percent between 1982 and 1990. The populations of the three main islands, Santa Cruz, San Cristóbal and Isabella, grew by almost 70, 55 and 34 percent, respectively; the islands' population appears to have nearly doubled in the 1990s, to just under 20,000. Almost 70 percent of the islands' adult inhabitants in 1999 were migrants from other provinces of Ecuador. The strong links among tourism, economic growth, and migration have created pressures to restrict both tourist quotas and migration in an effort to preserve the islands' unique ecology.

The Galapagos Islands are directly inserted into the global economy through tourism. Tourism is the raison d'etre of the Galapagos economy, integrating virtually all of the islands' inhabitants directly or indirectly with global markets. The isolation that created the Galapagos Islands' unique eco-system also creates high transaction costs in trade with the Ecuadorian mainland. Thus, businesses and households on the islands supply many of the goods and services demanded by the tourist economy and by island residents, and changes in tourism influence local production, incomes, and prices.

Island residents providing tourist services are linked with others in the local economy. For example, hotels, restaurants, and bars hire local workers, pay rents to locals, and purchase local "intermediate inputs"—fruits and vegetables from farmers, fish from Galapagos fishermen, and meat from local livestock producers. Outside agents, including operators of cruise ships (whose voyages always begin and end at one of the islands) also purchase locally supplied goods and hire local workers. Payments for these goods and services enter the Galapagos economy, influencing incomes of agents who may not have any direct contact with tourists (for example, the fisherman or farmer who sells to restaurants, cruise ships, or families of ship crewmembers residing on the islands). They, in turn, stimulate new rounds of local expenditures that influence incomes of still more local agents. At each round, some—perhaps the majority—of the income growth escapes from the local economy in the form of demand for goods or services supplied outside the local region, federal taxes not spent in the province, savings in extra-regional banks, etc. Along the way, however, each round of progressively dampened expenditures creates new impacts of tourism on the local economy. Demand

that is not satisfied by markets outside the islands either stimulates supply, leading to real economic growth, or else, if supply is constrained, creates inflationary pressures. Most likely, it leads to a combination of expansion in real economic output and higher prices of goods whose demand is stimulated, directly or indirectly, by tourism.

As the demand for labor to support tourist activities increases, so do local wages. A rising wage gap between island and mainland stimulates migration, mostly from towns and villages along Ecuador's west coast. Inasmuch as humans are not endemic to the Galapagos, the entire workforce in this nature-tourist economy can be traced originally to migration.

The Galapagos Islands, therefore, constitute a laboratory to study not only evolution, but also the impacts of globalization on a micro level. Tourist quotas are the key intervening policy variable between the islands and the global economy. These quotas are the focus of our Galapagos CGE analysis, presented below.

In 1999, a team of researchers from UC Davis and El Colegio de Mexico in Mexico City carried out the Economic Study of the Galapagos (ESG).[9] The objectives of this study were to document the evolution of major economic activities in the islands and explore how policy changes, including new environmental regulations, are likely to influence economic and population growth (via migration). The study's objectives called for economywide modeling tools capable of taking into account complex linkages among economic and environmental actors on the islands. Three surveys—a household survey, an establishment survey, and a survey of tourists—were carried out to obtain data to construct two Galapagos economywide models: a Social Accounting Matrix (SAM) multiplier model, presented in Taylor and Yúnez-Naude (1999), and a computable general equilibrium (CGE) model, which is the basis for the simulation results presented below (Taylor, Yúnez-Naude, Dyer, and Ardila, 2001). All accounts—production, factors, households, other institutions, and trade—in the CGE model are identical to those in the SAM model. However, the CGE improves upon the SAM model by explicitly incorporating price effects, nonlinearities in the response of economic actors to exogenous shocks, and migration. This study represents the first effort to our knowledge to estimate intra-national impacts of tourism in a general-equilibrium context.

Selected household and occupational characteristics from the household component of the survey appear in Table 6. Three quarters of the adult populations of the three main islands were born outside their island of residence. On Santa Cruz, the commercial center of the Galapagos, only 12 percent of adults were native to the island. There is little evidence of inter-island migration: only 4 percent of adults had migrated from another island in the archipelago. Just under seventy percent of adults were from mainland Ecuador, mostly from the sierra or coastal villages.

[9] The survey and initial data analysis were sponsored by the Inter-American Development Bank.

Table 7 presents the sector composition of the "gross island product" (GIP), which was estimated from value-added data gathered in the establishment survey. The cruise ship industry accounts for the largest share of value-added in the Galapagos economy. Cruise ships owned by entities on the mainland generated 46 percent of total value-added on the islands. Despite being based on the mainland, these ships channeled some value-added into the island economy (principally by paying wages to crew members whose families were residents of the islands). They also generated local growth linkages by demanding inputs supplied by islanders. Locally based cruise ships accounted for 17 percent of the GIP, followed by fishing (8 percent), commerce (7.5 percent), and farming (5 percent). The Table reveals large differences in the composition of value added among islands. For example, the cruise ship share ranges from 0 on Isabella to 83 percent on San Cristóbal, while the fishing share ranges from 2 percent on San Cristóbal to 61 percent on Isabella. Santa Cruz has both the largest and most diversified of the three island economies.

We used the Galapagos CGE model to simulate the impact of an increase in the tourist quota on the Galapagos economy and on mainland-to-island migration. An increase in the tourist quota stimulates the island economy by increasing demand by tourists and by all members of the island population who are linked in any way to tourism. As the island economy expands, the demand for labor increases. This results either in an increase in local wages (if government restrictions on migration are effective) or in an increase in migration (as new employment and income opportunities attract workers from the mainland). Consistent with what has happened in the past, our simulation permits migration in response to increased labor demand on the islands. The intent of this assumption is not to question the future effectiveness of government restrictions on internal migration, but rather, to illustrate the potential influences of globalization on migration, through tourism. The migration response estimated below may be viewed as a gauge of migration pressure or "potential" in this global tourist economy.

Results of a simulated 10-percent increase in the tourist quota are reported in Table 8 for each of the archipelago's three main islands of Santa Cruz, San Cristóbal, and Isabella, which are linked together in the model by trade and tourist flows. Expansion of the tourist quota directly stimulates tourist activities, the production of which expands by more than 8 percent on the main island of Santa Cruz and 2 to 4 percent on the other two islands. Tourist activities include hotels, restaurants and bars, local tours, and travel agencies. Tourism also stimulates environment-based production activities: hunting, timbering, and processing and sale of drinking water. Production in these activities increases by nearly 4 percent on the main island and between 0.4 and 0.9 percent in the two smaller islands.

Incomes in all major household groups on the islands increase. On Santa Cruz, the income increases range from 3 to 4 percent in households where the primary income earner is employed in agriculture, self employed, or salaried, to more than 4.5 percent in fishing households. Smaller increases in income on the other two islands reflect the unequal distribution of total benefits from tourism across the three islands.

Increased island production to satisfy the demands of tourists and island households requires labor, and this, in turn, stimulates migration to the islands (unless government policies effectively restrict this migration). If migration is permitted or cannot be controlled, the 10-percent increase in the tourist quota triggers migration equivalent to (depending on skill type) between 4.8 and 5.7 percent of the total workforce in Santa Cruz, the main commercial island; and between 1 and 2 percent of the workforces in San Cristóbal and Isabella. (If migration is effectively controlled, island wages increase by an estimated 7 to 9 percent on Santa Cruz and between 2 and 3 percent for most labor types on the other two islands.)

Galapagos tourism also generates substantial economic linkages with the rest of Ecuador. Net "imports" from the mainland increase nearly 4 percent in Santa Cruz and around 1 percent in the other two islands. Economic agents on the mainland of Ecuador become inserted into the global economy indirectly, by trading with the Galapagos tourist economy.

3
Conclusions

The basic tenet of this paper is that a micro economywide perspective is needed to understand the impacts of globalization within nations and the mechanisms by which economic actors, and the economies of which they are part, become inserted into world markets. This requires an analytical method that (a) offers a microeconomic focus missing from the existing empirical economics literature on trade integration; (b) goes beyond the traditional microeconomic preoccupation with individual economic actors (e.g., households) to include complex linkages among actors that transform local, regional, and national economies; and (c) encompasses the market institutions that govern market interactions and shape the ways in which globalization plays out within nations.

Through the export of labor (migration) and other commodities, economic agents are inserted directly into the global economy. These agents maintain complex economic interactions with other agents in the local, regional, and national economies of which they are part. Through these interactions, new agents become inserted into the global economy indirectly, and the economies of households, communities, and regions change.

This paper draws upon case studies from China, Mexico, El Salvador, and Ecuador's Galapagos Islands to illustrate how household and local economies are transformed by globalization. In our econometric study of Chinese village households, internal migration, stimulated by China's increasing integration with world markets, reshapes household production activities. Imperfect market environments both stimulate migration (to obtain capital and income security) and create difficult tradeoffs (due to the loss of family labor to migration) in the households migrants leave behind. In a Mexican village-town economy, changes in agricultural policies mandated by NAFTA reshape production and resource allocations throughout the local economy, sometimes in

surprising ways. International migration increases village incomes, stimulates some production activities while causing others to contract, and transforms the structure of village-town economies in a former conflict zone of El Salvador. In Ecuador's Galapagos Islands, a thriving "tourism export" economy underlies economic growth and draws on internal migration for labor while creating environmental concerns that have been a focus of recent policy reforms aimed to protect fragile environments while restricting internal migration.[10] The diversity and broad distribution of local benefits from tourism, together with an elastic migration response to tourism, represent serious challenges to the successful implementation of these reforms. The Galapagos findings illustrate how globalization shapes a local economy in which the mechanism of insertion into global markets is not a labor migrant, but rather, an export activity.

The microeconomics of globalization has important ramifications for development economics research, policy, and project evaluation.

Theoretical and empirical studies with an aggregate or macro focus on nations or groups of nations miss the ways in which globalization plays out in local economies, and they do not offer insights into how policies and development projects may influence this process. On the other hand, microeconomic models focusing on individual actors (individuals, households, or firms) are likely to miss many of the influences of globalization, as well as the potential influences of public policies and development programs, on LDC economies. Impacts on economic agents directly affected by globalization or government policies are only part—and perhaps only a small part—of the story of how globalization unfolds within nations. Many other economic agents are influenced indirectly, through local market interactions, and they are a key part of the process by which globalization transforms local, regional, and ultimately national economies. A clear example of this is the stimulating effect of tourism on Galapagos Island agriculture and fishing activities, neither of which sell their output directly to tourists, or the impacts of agricultural policy reforms on nonagricultural activities in rural Mexico.

The conclusion that agents directly interacting with world markets transmit the influences of globalization to others has relevance beyond understanding how globalization plays out within nations. For example, project evaluation methods need to have an expanded vision that includes economic actors not directly affected by the

[10] La nueva *Ley de Régimen Especial para la Conservación y Desarrollo Sustentable de la Provincia de Galápagos.* A World Wildlife Fund study concluded that "Human population growth, invader species and commercial fishing threaten to destroy the fragile ecological balance in the world famous Galapagos islands…Although 97 percent of the island's land area has National Park status, the population of the Galapogos islands has more than doubled in the last 10 years, mainly due to migration from the Ecuadorian mainland. With this migration, many foreign plant and animal species are being introduced. Their estimated numbers have grown from about 77 in 1971 to more than 260 today." (Environmental News Network http://www.enn.com/enn-news-archive/1997/07/071897/07189711.asp)

project under consideration. Assessing the impacts of agricultural programs or policy reforms requires going beyond the agricultural households directly affected by those reforms. For example, "decoupling" schemes in Mexico, which replace food price supports with direct income payments to farmers, have impacts on the rural economy that extend beyond the households receiving PROCAMPO payments. In fact, market imperfections in rural areas cast doubt on whether such transfers are truly "decoupled" from production, once the full impact of the transfers unfolds within local and regional economies. Rural education policies create private benefits, to the households whose members' schooling increases, as well as social benefits, which unfold through these households' interactions with others in the rural economy. Technological change has both direct effects (on the adopting households) as well as indirect "social" effects (on households interacting with adopters through factor and commodity markets). By concentrating on directly affected economic actors, we may be looking for the impacts of policy, market, and other changes in the wrong places.

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Figure 1. Insertion of Local Economic Agents into Global Economy

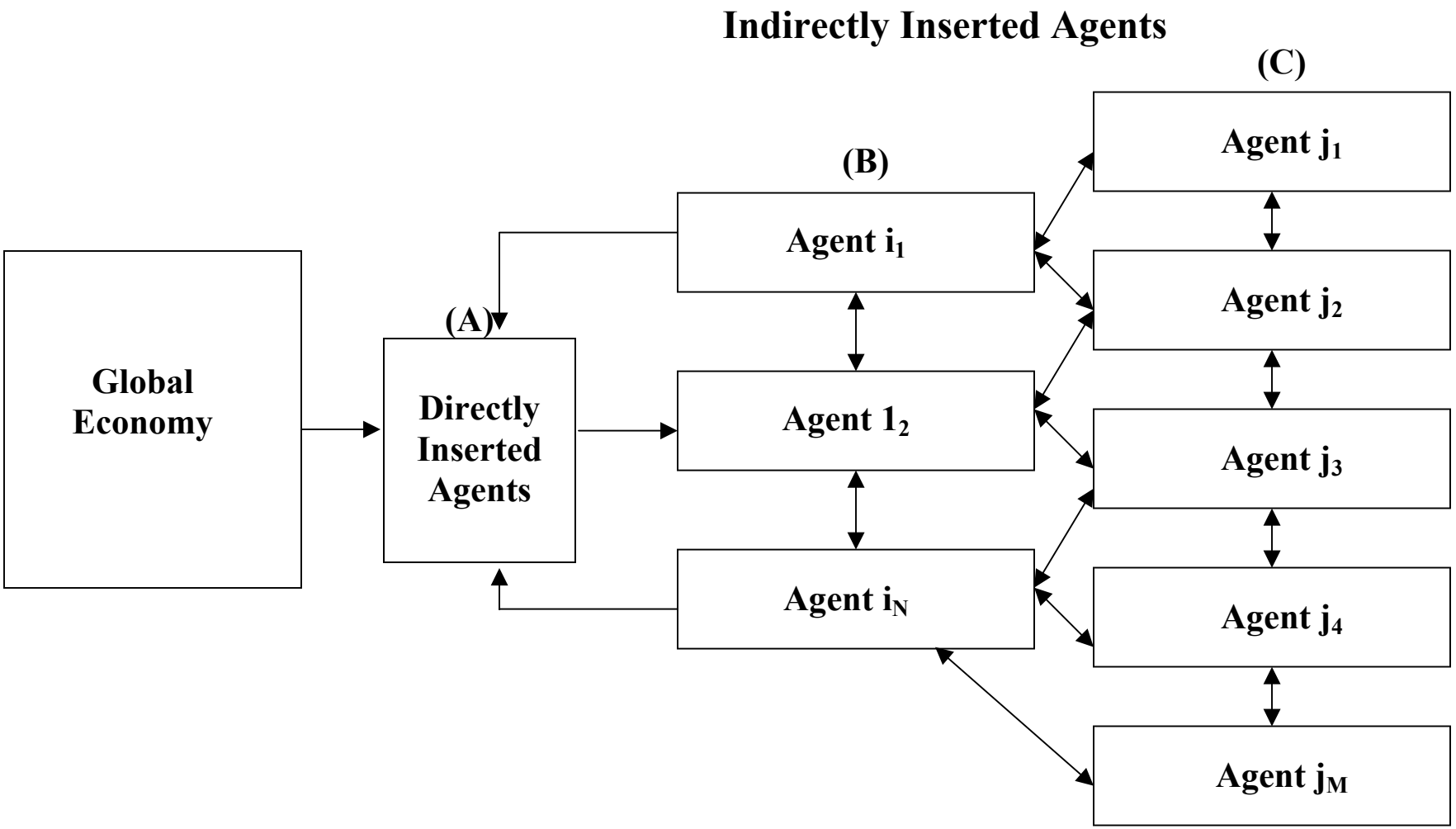
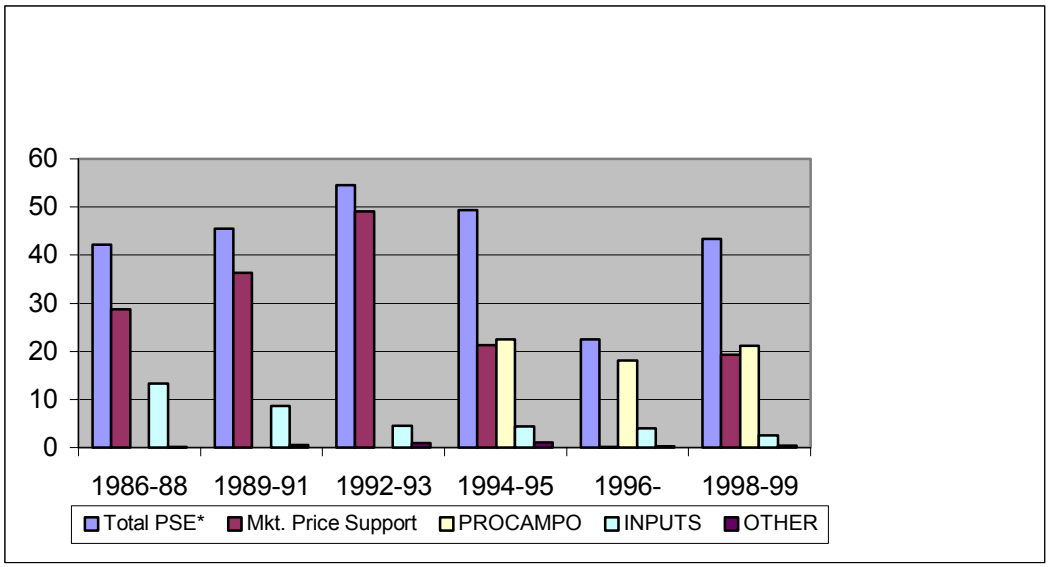


Figure 2. Percentage of Producer Support and Its Components in Total Value of Maize Production



Source: Compiled from OECD data by Yunez-Naude (2001).
* Producer Support Estimate

Table 1: Estimated Effects of Migration and Remittances on Income Sources in a Sample of Chinese Village Households

Explanatory Variables	Marginal Effect on Income Source (yuan)			
	Remittances	Farm Income	Self-Employment Income	Wage Income
Number of Migrants	824**	-3001*	-7167**	-452
Remittances (yuan)		2.78**	4.50**	0.03

* (**) denotes significance at the .10 (.01) level.
Source: DeBrauw, Taylor and Rozelle, 2001.

Table 2: Mexico Village-Town Household Income Diversification

Of Households with Income from… **Shares with at Least Some Income from…**

	Households							
Sector	Number	%	Staples	Cash Crops	Wages	Noncrop Production	US Migration	Internal Migration
Staple	101	52%	1.00	0.84	0.54	0.55	0.52	0.33
Cash Crop	118	60%	0.72	1.00	0.52	0.57	0.53	0.36
Wage	105	54%	0.52	0.58	1.00	0.53	0.39	0.25
Noncrop	106	54%	0.53	0.63	0.53	1.00	0.45	0.34
US Migration	85	43%	0.62	0.73	0.48	0.56	1.00	0.33
Internal Migration	55	28%	0.60	0.78	0.47	0.65	0.51	1.00

In Households with Income from… **Share in Total Household Income of…**

Sector	Staples	Cash Crops	Wages	Noncrop Production	US Migration	Internal Migration
Staple	0.06	0.14	0.27	0.32	0.18	0.03
Cash Crop	0.08	0.14	0.26	0.27	0.21	0.04
Wage	0.06	0.04	0.58	0.18	0.13	0.02
Noncrop	0.04	0.04	0.26	0.46	0.15	0.04
US Migration	0.05	0.13	0.18	0.31	0.31	0.02
Internal Migration	0.06	0.05	0.27	0.27	0.19	0.16

Source: Compiled from Mexico Village-Household Survey Data

Table 3: Mexico Village-Town CGE Model PROCAMPO Experiment: Estimated Percentage Effects of a 10% Decrease in Grain Prices and Compensating Income Transfer* under Alternative Market Closure Rules

	A Neoclassical Perfect Markets		B Endogenous Local Wage		C Endogenous Village Staple Price	
Land Factor	Short Run	Long Run	Short Run	Long Run	Short Run	Long Run
Basic Grain Prices	-10.0	-10.0	-10.0	-10.0	0.5	0.2
Output						
Staple	-8.1	-25.8	-8.0	-25.7	0.4	0.7
Other Crop	0.0	3.3	0.1	3.5	0.0	-0.1
Livestock	0.1	4.3	0.1	4.3	0.0	-0.1
Non. Ag.[1]	0.0	0.0	0.7	1.2	0.2	0.3
Mexico-US Migration	0.0	0.0	0.2	0.4	0.1	0.1
Labor Factor Demand	-1.2	-2.0	-0.8	-1.3	0.2	0.3
Wage	n/a	n/a	-0.1	-0.1	0.0	0.0
Village Real GDP	-2.4	-3.1	-2.1	-2.5	0.2	0.2
Household Real Income						
commercial	0.4	0.1	0.6	0.5	1.5	1.6
subsistence	1.1	0.7	1.3	1.1	0.7	0.8
Capital Investment	-0.5	-0.8	-0.2	-0.5	1.1	1.1
Marketed Surplus[2]	126.4*	245.7*	127.7*	247.7*	n/a	n/a

1 Includes renewable resource extraction, retail and "other" activities.
2 Large percentages are a consequence of a small (*=negative) marketed surplus in base.
*Transfer equal to 10% of base value of staple production

Source: Taylor, Yúnez-Naude and Dyer, 1999.

Table 4: Migration Prevalence, El Salvador and Study Site of Santa Elena, and Santa Elena Migrant Destinations

Department	Percentage of Households With Reported Migrant	
El Salvador	17	
Santa Elena	Town 31	Canton
	31	22

Destinations of Santa Elena Migrants (% at each destination)

Los Angeles, CA	50.00%	67.31%
San Francisco, CA	6.90%	0.00%
Texas	3.45%	1.92%
Washington D.C. and Virginia	3.45%	1.92%
New York	15.52%	1.92%
Undetermined U.S. or other US destination	18.97%	23.08%
Other Destination outside U.S.	1.72%	3.85%

Source: Taylor, Zabin and Eckhoff, 1999.

Table 5: Estimated Impacts of Currency Devaluation in a Former Conflict Zone of El Salvador

Village-Town Activity	Percentage Change From Base	
	Period 1 (Short Run)	Period 2 (Medium Run)
Production		
Agriculture	-4.18	-3.27
Nonagricultural	-1.84	-1.24
Wages	-2.02	-1.48
Household Farm Incomes	1.71	1.87
Income by Household Group		
Migrant Household	6.59	6.59
Nonmigrant Households	-1.42	-1.16
Savings	0.62	1.04
External Linkages:Migration		
Domestic	-15.32	-15.61
U.S.	11.95	11.57
External Linkages:Marketed Surplus*		
Agriculture	3.56	3.41
Nonagricultural	4.08	4.01

* Marketed Surplus of both goods is negative in the base.
Source: Taylor, Zabin and Eckhoff, 1999.

Table 6: Galapagos Household Survey, Socio-demographic Characteristics

Characteristic	Island			
	Santa Cruz	San Cristóbal	Isabela	Total
Household Sample Size	152	80	35	267
Total Household Members	613	369	160	1,142
Average Members Per Household	4.0	4.6	4.6	4.4
Adults Per Household*	2.5	2.6	3.0	2.7
Average Ages				
Household Heads	37.0	44.7	41.3	41.0
Household Members	22.6	24.6	25.5	24.2
Percentage of Adults...				
Born on Island	12	37	52	26
Born on Other Galapagos Island	4.6	1.9	3.8	3.7
Born on Mainland	81.6	60.6	44.1	69.8
Born Abroad	1.9	1.0	1.0	1.5

*18 years or older and workers between 15 and 17 years of age.
Source: Taylor, Yúnez-Naude, Dyer and Ardila, 2001.

Table 7: Galapagos: Composition of Gross Island Product, 1997-1998

Sector	Island (% of Gross Island Product)			
	Santa Cruz	San Cristóbal	Isabella	Total
Agriculture and Livestock	5.4%	3.3%	5.8%	4.8%
Fishing	6.5%	2.2%	60.7%	7.8%
Fishing Cooperative	0.4%	0.0%	0.0%	0.2%
Household Environmental	2.7%	0.1%	1.8%	1.8%
Water	1.4%	0.1%	0.7%	0.9%
Other Production Activities	1.0%	3.8%	0.5%	1.9%
Tourist Services				
Equipment Rental and Day Tours	1.1%	0.2%	0.6%	0.8%
Travel Agencies	3.1%	0.0%	3.0%	2.1%
Locally Based Cruise Ships	20.8%	10.7%	0.0%	16.6%
Mainland Based Cruise Ships	36.1%	72.1%	0.0%	45.9%
Transport	3.5%	1.4%	1.4%	2.7%
Varioius Services	2.1%	4.9%	4.4%	3.1%
Restaurants, Hotels	5.5%	0.6%	5.3%	3.9%
Commerce	10.4%	0.5%	15.9%	7.5%
Total	100.0%	100.0%	100.0%	100.0%

Source: Taylor, Yúnez-Naude, Dyer and Ardila, 2001.

Table 8. Estimated Percentage Effects of a 10% Increase in Tourist Quota in the Galapagos Islands

Variable	Island		
	Santa Cruz	San Cristobal	Isabella
Production			
Agriculture	1.82	0.48	1.18
(Price)	(2.16)	(0.36)	(0.26)
Fishing	3.04	0.62	1.49
(Price)	(0.14)	(0.16)	(0.02)
Environmental Activities	3.92	0.43	0.92
(Price)	(0.09)	(0.00)	(0.00)
Other Production	2.62	0.52	1.45
(Price)	(0.42)	(0.11)	(0.04)
Tourist Activities	8.22	2.5	4.08
(Price)	(0.19)	(0.05)	(0.09)
Other Services	3.01	1.56	1.18
(Price)	(0.23)	(0.04)	(0.06)
Commerce	4.3	1.03	1.34
(Price)	(0.16)	(0.04)	(0.03)

Table 8. Estimated Percentage Effects of a 10% Increase in Tourist Quota in the Galapagos Islands (Cont.)

Variable	Island		
	Santa Cruz	San Cristobal	Isabella
Household Real Income			
Agricultural	3.94	0.99	1.46
Fishing	4.69	0.93	1.52
Self Employed	3.47	0.85	0.98
Private Salaried	3.84	0.49	1.39
Public Salaried	3.29	0.47	1.43
Net Imports from Rest of Ecuador	3.93	0.83	1.31
Migration	5.02	1.28	1.71
Wage Labor	5.72	1.51	1.57
Family Labor	4.83	1.21	1.76
Wage (without Migration)			
Skilled Workers	9.16	0.00	2.61
Unskilled Workers	6.72	2.75	2.67

Source: Taylor, Yúnez-Naude, Dyer and Ardila (2001)