

QnAs with Robert Townsend

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Household businesses and small enterprises are a staple of villages in Thailand. In the late 1990s, Robert Townsend, an economic theorist at the Massachusetts Institute of Technology, ventured into Thai villages to document household finances and sketch the ties linking family and village finances to regional and national economies. For the most part, economists had not delved into how these businesses, such as shrimp farming and silk growing, influence and react to changes in Thailand's emerging economy. Townsend's efforts led to the Townsend Thai Project, which collects financial data from around 3,000 households every year. Elected as a member of the National Academy of Sciences in 2012, Townsend put forth a model of Thailand's economy in his Inaugural Article (1), which he discussed with PNAS.

PNAS: What drew you to Thailand's economy?

Townsend: I had been studying medieval villages and villages in India. I was in Thailand for family reasons. So I set out from my Thai home base to compare and contrast Thai villages with what I had found in the historical and India material. Thai villages—even those relatively close to one another—were remarkably different from one another in terms of their local institutions and their use and access of outside markets and institutions.

PNAS: You report that people living in urban, or industrial, areas and rural, or agrarian, areas face different financial obstacles. You incorporate those differences into the economic model in your Inaugural Article. What are those financial obstacles, and how do they differ regionally?

Townsend: In the rural areas in northeast Thailand, one sees that debt and wealth are positively related to one another, as if the amount that can be borrowed is limited by collateral. In the central and industrialized areas, debt and wealth are negatively related to each other, as if self-financing with increased wealth alleviates the burden of repaying debt.

PNAS: The article presents an economic model that illustrates how geographic financial heterogeneity

influences the flow of labor and capital between urban and rural areas. The labor flow includes daily to annual labor migrations, and the financial capital ranges from the funds needed to run shrimp ponds to cash and savings accounts. Can you describe the data fed into the model?

Townsend: We have monthly data on 16 villages going back to 1998. The monthly data are on consumption, labor supply, gifts, borrowing and lending, and village networks, for example. We find out what kind of production activities each household is engaged in. These could be fish or shrimp or livestock or crops or wage earnings. We observed and measured transactions to create financial accounts for these households. Then, we also have parallel—although less detailed—annual surveys that have been running in the rural areas since 1997 and urban areas since 2005.

PNAS: Your article proposes an expanded definition of big data. How do you define big data?

Townsend: People think of big data as the size of data sets, but the term "big data" actually includes variety and complexity of data. In Thailand, we have data from not only households but we have it from the village head men. We have soil and water measurement [as well as] data from joint liability groups who guarantee loan repayment. Again, we have annual data in urban and rural areas, and we have monthly data. So it's a challenge to think about using all these variables and data sets. We are using theory to guide us as to which variables to look at.

PNAS: Could you describe the economic model used in the study?



Robert Townsend. Image courtesy of MIT Economics and L. Barry Hetherington (photographer).

This QnAs is with a recently elected member of the National Academy of Sciences to accompany the member's Inaugural Article on page 6176 in issue 24 of volume 114.

Townsend: If the urban and rural sectors were acting as two separate isolated economies, you would see low wages and interest rates in the rural areas and high interest rates and wages in the urban areas. When you open up the economy to labor migration and capital flows, capital and labor are going to move so as to effectively lower the wage and interest rate in the urban areas and raise the wage and interest rate in the rural areas.

PNAS: In which direction is labor and capital flowing?

Townsend: They are leaving the rural areas—the northeast and the villages—and going to the industrialized areas, as in the central provinces near Bangkok, and towns and cities. That is what causes the factor prices to equalize. The urban areas are importing 23% of the capital that they end up using and 75% of the labor. Vice versa, the rural areas are exporting 39% of their capital and 86% of their labor. There are very sharp differences in the levels of consumption, income, and wealth between the two areas. The net worth variables are lower in the northeast relative to the central area. The numbers for consumption, income, and other variables in the central area are larger than in the northeast.

PNAS: Were the results surprising?

Townsend: It's surprising that there have been many explanations for urbanization rates, but very few that explain the degree of heterogeneity of these rates just by varying the financial heterogeneity on the ground. Our story has nothing to do with agglomeration, the benefits of being in an urban area, or geographic advantages. All of that may be going on as well, but we can explain quite well the degree of regional urban concentration with regional heterogeneity in financial obstacles without including those ingredients.

PNAS: Do economists debate the influence of regional heterogeneity in financial obstacles on labor and capital flow?

Townsend: Actually, I would say we are drawing renewed attention to the flow of funds and labor migration. It has, at various periods of time, been central to economists' thinking, but economists started to go to macroeconomic models, looking at whole country aggregates instead of looking at the regional or household level numbers. People have taken notice of the migration of labor out of

rural areas into urban areas, but it's not that well measured. Capital flows are not measured at all. We have been trying to encourage countries—Thailand in particular, but also Mexico and other countries, including the US—to enable better use of existing flow of funds data by identifying the geographic location of the transacting agent.

PNAS: Using your model, you ran a policy experiment on the dynamics between the rural and urban sectors. What did you find?

Townsend: We asked what would happen if these sectors were more isolated from each other. What if there was pressure to protect workers in cities and industrialized areas from incoming labor migration—protect in terms of wages? Likewise, what if there was pressure to protect rural areas from capital outflows—to keep savings at home? We can trace out the consequences of those kinds of restrictive, isolationist, and regionalist policies. This policy basically would hurt the economic life in the cities rather enormously. There are substantial decreases in the average level of consumption, income, and wealth. In rural areas and nationally, there would be a big drop in productivity and likely a pretty big increase in inequality overall.

PNAS: Why would that happen?

Townsend: The idea is that intermediation is good for overall efficiency. You want resources to flow from areas where they are underused to areas where better use can be made of those resources. There is an overall efficiency that comes with allowing labor and capital to move around. Small enterprises and profits are particularly impacted.

PNAS: Would the findings from this policy experiment extend to other countries?

Townsend: We are conducting this in Thailand, but there is a message here that is relevant for many other countries. We're living in a world with Brexit. Spain is at a risk of fragmenting. We certainly have these debates going on in the US about protecting formerly industrialized areas and rural areas. I think geography plays a big part [in] understanding how these economies are put together. My appeal is to create these kinds of models for the US and other countries. Models have the advantage of tracing through what would happen under these policies without actually implementing the policy.

¹ Moll B, Townsend RM, Zhorin V (2017) Economic development, flow of funds, and the equilibrium interaction of financial frictions. *Proc Natl Acad Sci USA* 114(24):6176–6184.