

Helping Infant Economies Grow: Foundations of Trade Policies for Developing Countries

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In this paper Greenwald and Stiglitz examine the impact of trade restrictions in economies in which technological spillovers within countries and across industries are fundamental to the process of growth. Since that work, it has been clear that markets, by themselves, do not necessarily, or in general, lead to overall dynamic efficiency; and that there are often trade-offs between static inefficiencies (e.g., associated with patent protection) and long-term growth. They find that the dynamic benefits of broad trade restrictions may outweigh their static costs. Their analysis provides the basis of an **infant economy** (as opposed to an infant industry) argument for protection.

THE BASIC MODEL

This paper develops a simple two-sector model with an industrial (modern) and a traditional (craft or agricultural) sector. There are four key features to the model:

- a) there are spillovers from the industrial sector to the craft sector, for which firms in the industrial sector are not compensated;
- b) such spillovers are geographically based, that is, it is only productivity increases in the industrial sector in the developing countries that affect productivity increases in the traditional sector;
- c) innovations are concentrated in the industrial sector;
- d) size is among the important determinants of the pace of innovation in the industrial sector.

With this model they want to demonstrate that trade restrictions enhance the size of the industrial sector; the benefits spill over to the rural sector; and national income grows at a possibly far faster pace.

MODEL'S ASSUMPTIONS:

- 1) two economies—one developed (D) and the other less developed (L);
- 2) two types of goods: one industrial (I) and the other agricultural/craft (A);
- 3) both the goods are produced using only labor as an input, with technologies that at any point in time embody constant-returns-to-scale;
 - C^D_I (C^D_A) amount of labor per unit of industrial (agricultural) output in the developed economy;
 - C^L_I (C^L_A) amount of labor per unit of industrial (agricultural) output in the less developed economy;
- 4) the developed economy enjoys absolute advantages in the production of both goods but the less-developed economy enjoys a comparative advantage in agricultural/craft production:
 - $C^D_A / C^D_I > C^L_A / C^L_I$
- 5) the developed economy is very large relative to the less-developed economy, in particular, that it is capable of supporting the entire global demand for industrial output and at the same time producing significant amounts of agricultural/craft output. Thus, in equilibrium, the less-developed economy is fully specialized in agricultural/craft production, while the developed economy produces both goods;
- 6) prices will be determined by the trade-off in the developed economy between the cost of producing the industrial good and the cost of producing the agricultural/craft good.;
- 7) the less-developed economy's wage level is lower than the wage level in the developed economy since $C^L_A > C^D_A$

A. Free Trade Equilibrium

Since $C^D_I / C^D_A < C^L_I / C^L_A$, industrial production in the less-developed economy is not economically viable. It specializes in agriculture.

The composition of consumption in the less-developed economy is then determined by the real price, p^D_I .

The composition of output in the industrial economy is determined by the global demand for industrial goods.

B. Dynamic Development

If we introduce technological progress into this static equilibrium we have important implication: productivity growth does not affect the price of industrial goods relative to agricultural/craft goods.

Productivity growth results from:

- research and development efforts which, while originally devoted to one sector, have benefits that inevitably spill over to other sectors;
- human capital improvements, which, again while they arise in one sector, inevitably migrate with labor to other sectors of the economy;
- the accumulated knowledge and attention of managers and engineers, which, although developed in one sector, also naturally migrates to other sectors.

Next, we assume that the rate of technological progress, g , is determined by

$$g = f [Q_I / (Q_I + Q_A)]$$

where Q_I is the output of the industrial sector and Q_A is the output of the agricultural/crafts sector.

The process of productivity growth described by this equations has important long-run consequences for our two economies. In fact, the less developed economy, with $Q_I^L = 0$, stagnates. Without an industrial sector there is no productivity growth.

Over time, the less-developed economy falls farther and farther behind its developed counterpart.

C. The Role of Trade Policy

Consider now the consequences of a ban on industrial imports by the less developed country (or equivalently the imposition of prohibitively high tariffs). The result would be an immediate welfare loss as it substituted high-cost, domestic industrial production for lower-cost imports from the developed economy. In the new autarkic equilibrium, however, industrial output in the less-developed economy would no longer be zero, and productivity growth would now occur.

Just as in the case of the developed economy, a high-tariff, less-developed economy would produce a mix of outputs dependent on its own demands for industrial and agricultural/craft products at a fixed relative price.

Thus, trade barriers may enhance rather than impair economic welfare.

THE INDUSTRIAL SECTOR AS THE SOURCE OF INNOVATION AND SPILLOVERS

A. Knowledge Production

As we have seen before, the key assumption is that the industrial sector is the source of innovation.

The industrial activity takes place in firms that (relative to firms in the other sector) are large, long-lived, stable, and densely concentrated geographically. Agricultural/craft production, by contrast, typically takes place on a highly decentralized basis among many small, short-lived, unstable firms.

The basic model has also assumed that there are important spillovers, not only within the sector, but to the agricultural/craft sector. These spillovers involve knowledge, human capital, and institutional development.

- ***Resources and Incentives for Research and Development***

Since particular innovations are far more valuable to large organizations, which can apply them to many units of output, than to smaller ones with lower levels of output, there is far greater incentive to engage in R&D in the industrial sector than in the agricultural/craft sector. The result will be higher innovation investments in the former sector than in the latter.

- ***Stability and Continuity***

The accumulation of knowledge on which productivity growth is based is necessarily cumulative. In opposite to small, dispersed organizations (where the loss of single individuals may completely compromise the process of knowledge accumulation), large organizations, with stability and continuity, preserve and disseminate the knowledge involved, and allow the continuity in jobs and personnel to support these processes. As a result, steady productivity improvement will be more likely to arise from industrial than agricultural/craft production.

- ***The Ability to Support Public R&D***

Large scale, densely concentrated activities are far easier to tax than small-scale, dispersed activities. Thus, economies with large, accessible industrial sectors will be far better able to support publicly sponsored R&D than those consisting largely of dispersed, small-scale agricultural/craft production units. This factor may be especially important in the support of agricultural research, this activity directly contribute to agricultural productivity growth, but could not be supported without a taxable base of industrial activity.

- ***Human Capital Accumulation***

Opportunities and incentives for accumulating *general* human capital are likely to be far greater in large, complex industrial enterprises with a wide range of interdependent activities than in a small, dispersed, narrowly focused agricultural/craft enterprises. The resulting human capital accumulation is a critical element in both developing the innovations on which productivity growth depends and in disseminating them as workers move between enterprises and across sectors.

• ***Public Support for Human Capital Accumulation***

Just as in R&D, private capital market failures may mean that public support, in the form of free primary and secondary education, is a critical component of general human capital accumulation. Again, the greater susceptibility of concentrated, industrial enterprises to taxation is key to funding. As they migrate between sectors, ultimately higher productivity growth in the agricultural/craft sector will be engendered as well.

• ***Concentration and Diffusion of Knowledge***

Diffusion of knowledge among densely collocated, large-scale industrial enterprises is likely to be far more rapid than diffusion of knowledge among dispersed, small-scale agricultural/craft enterprises.

•*Monitoring and Physical Capital Investment and the Development of a Robust Financial Sector*

Industrial firms, because of their large scale, should be less costly to monitor. Hence, an industrial environment should be characterized by a more highly-developed financial sector than an agricultural/craft environment. Once developed, a strong financial sector facilitates capital deployment throughout the economy, even in the rural sector.

•*Learning to Learn and Cross-Border Knowledge Flows*

Success in the industrial sector requires knowledge and the ability to acquire knowledge that is common across borders. Some of this knowledge and these abilities are relevant to the agricultural sector and disseminate to it through mechanisms already described.

B. Knowledge Transmission

For the authors what matters is how knowledge (productivity increases) are generated and transmitted. They have described some of the mechanisms (labor mobility) through which dissemination across sectors occurs. Their analysis assumed that spillovers are concentrated within national boundaries.

This assumption rests on four factors:

- geographical proximity;
- international restrictions of movement of labor (and associated movements in knowledge and human capital);
- language barriers;
- historical patterns of social interactions, which are strongly affected by national boundaries.

The results require only that transmission of knowledge in the agricultural/craft sector be stronger within a country. Indeed, these results are strengthened if there is some element of transmission across countries within the industrial sector, so long as that transmission increases with the size of the industrial sector in the developing country. For the developing country, there is a further reason for promoting the industrial sector: it is the window to the world, the channel through which more advanced knowledge gets transmitted to the developing country for both industry and agriculture.

THEORY and EVIDENCE

There has been a widespread presumption that free trade is good for growth. Yet, the most successful countries, both today (in East Asia) and historically (including the United States), not only engaged in trade restrictions, but those restrictions were an explicit part of their growth strategies. Even war times, in which trade is interrupted, have often seemed to be periods of enormous dynamic gains.

Our interpretation is also consistent with numerous historical experiences, including those noted below.

What about countries like India and China, which have liberalized and grown? A closer look at the timing shows that their takeoff occurred prior to trade liberalization, though in both cases it was associated with internal liberalization. Reducing domestic distortions, while maintaining external barriers, provides precisely the conditions for the dynamic gains identified in this paper.

HISTORY and POLICY

The Greenwald and Stiglitz's analysis can be used to derive an optimal tariff, balancing the long-term benefits of fostering industrial growth against the short-term costs of inefficient acquisition of industrial products.

The model has more general implications about the nature of such tariffs:

- tariffs should be broadly and uniformly applied to industrial products;
- a broadly based industrial tariff system should be, to some extent, naturally self limiting. Successful local industries should begin to export and, therefore, be naturally predisposed to favor free trade;
- finally, it may be that individual national markets are too small to support robust local industries. In that case, the natural extension of the basic policy is to combine local economies at similar stages of industrial development into free-trade areas, which are then protected by common uniform, external industrial tariff business.

Ultimately, the test of the effectiveness of such uniform, infant-economy tariff policies is how well they have worked in practice; and here, at least superficially, the historical record is encouraging. The trade policy of the newly formed European Economic Community (EEC) was, in the 1950s, one of high, but relatively uniform, external tariff barriers. The growth of the EEC behind these barriers was rapid. Similarly, Asian economies like Japan, Korea, China, Taiwan, and Singapore have favored broad rather than narrowly tailored barriers to trade, and they have all experienced strong growth. In its early history, the United States also tended to favor high and broadly applied industrial tariffs and succeeded in fostering high levels of growth.

Rethinking Development Economics

by JOSEPH E. STIGLITZ

In this essay, Stiglitz wants to argue that the long-term experiences in growth and stability of both developed and less developed countries, as well as the deeper theoretical understanding of the strengths and limitations of market economies, provide support for a “new structural” approach to development, an approach similar in some ways to that advocated by Justin Lin in his paper, but markedly different in others. This approach sees the imitations of markets as being greater than he suggests, even well functioning market economies are, on their own, neither efficient nor stable.

The only period in the history of modern capitalism when there has not been repeated financial crises was the short period after the Great Depression when the major countries around the world adopted, and enforced, strong financial regulations. Interestingly this was also a period of rapid growth and a period in which the fruits of that growth were widely shared. The perspective that the author presents differs not only in the efficiency and stability of unfettered markets, but also in what it sees as the primary driver of economic growth.

For Stiglitz, improvements in knowledge are a primary source of growth and this is even more interesting for developing countries.

As he emphasizes, what separates developing and developed countries is not just a gap in resources, but a disparity in knowledge.

But the view that creating a learning society, focusing on absorbing and adapting, and eventually producing knowledge, provides markedly different perspectives on development strategies than those provided by the neoclassical model.

The standard market failures approach criticized these conclusions by focusing on a variety of market imperfections. Research over the past 20 years has explored the consequences of market failures like imperfect capital markets, traced these imperfections back to problems of imperfect and asymmetric information, and proposed a set of remedies, which in some countries, in some periods, have worked remarkably well. Good financial regulations in countries like India protected them against the ravages of the global financial crisis.

But the perspective of the “**learning society**”—or, as the authors call it, the “**infant economy**”—adds a new dimension to the analysis.

Knowledge is different from an ordinary commodity and it is a public good. If the accumulation, production, and transfer of knowledge are at the center of successful development, then there is no presumption that markets, on their own, will lead to successful outcomes. Indeed there is a presumption that they will not.

Even if a government would like to avoid addressing these issues, it cannot; for what the government does (or does not do) has consequences, positive and negative, for the development of the “learning society.” This is obviously so for investments in infrastructure, technology, and education; but also for financial, trade, intellectual property rights and competition policies.

At the center of creating a learning society is the identifying of sectors that are more amenable to learning, with benefits not captured by firms themselves, so that there will be underinvestment in learning.

Elsewhere Greenwald and Stiglitz have argued that an implication of this is the encouragement of the industrial sector, which typically has large spillovers.

There is probably no country that has grown successfully without an important role, not just in restraining and creating markets, but also in promoting such industrial policies, from the countries of East Asia today to the advanced industrial countries, not just during their developmental stages, but even today.

The task is to adopt policies and practices—to create institutions like an effective civil service—that enhance the quality of the public sector. The successful countries did so.

The choice is not between an imperfect government and a perfect market. It *is between imperfect governments and imperfect markets*, each of which has to serve as a check on the other; *they need to be seen as complementary*, and we need to seek a balance between the two—a balance which is not just a matter of assigning certain tasks to one, and others to the other, but rather designing systems where they interact effectively.

FINAL REMARKS

❖ The author considers the relationship between growth and poverty reduction. While growth may be necessary for sustained poverty reduction, it is not sufficient. Not all development policies are pro-poor; some are anti-poor. Policies like financial and capital market liberalization have, at least in some countries, contributed to greater instability, and a consequence of that instability is more poverty. Policies to promote a learning economy too can either be pro- or anti-poor, but the most successful policies will necessarily be broad-based, engendering a transformation of the learning capacities of all citizens, and will therefore be pro-poor.

❖ There should be an improvement in the metrics we use to assess success. Our metrics don't typically capture the increase in the wealth of a country that is a result of the learning strategies advocated here. It is only gradually, over time, that the benefits are realized and recognized.

❖ Finally, the global financial crisis provides the basis for new understandings of why a few countries have succeeded so well and some have failed so miserably. Out of this understanding, perhaps we will be able to mold new policy frameworks that will provide the basis of a new era of growth—growth that will be both sustainable and enhance the well-being of most citizens in the poorest countries of the world.