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Clean Dynamics, Dirty Dynamics, and the Economics of NAFTA

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What is NAFTA about, economically? Despite the issues that NAFTA's advocates and opponents raised in any number of debates, NAFTA in large part is about efficiency. Strange to say, in terms of pure economics, NAFTA is only secondarily about jobs and scarcely at all about trade deficits.

A second important detail of the economic implications of NAFTA is that they cannot be realistically considered by focusing on NAFTA alone. The trade agreement operates in the context of Canadian, Mexican and U.S. laws and rules that affect the economics of NAFTA but are not part of NAFTA. As these laws and rules change, so do the economics of NAFTA. Moreover, the economic implications of NAFTA not only will motivate changes in these laws and rules, but there is much to suggest that they already have begun to. Individual firms and industries cannot always anticipate the impacts of a policy change — which is what NAFTA represents; when the policy change is not to their liking, they use the political system to seek redress, and the redress affects the economics of NAFTA.

A third and most important detail — particularly since neither of its two principal components was given any shrift at all in most official or unofficial debates about NAFTA — is that the impacts of the agreement are in part a strange dynamic to which I refer in the title of this paper. That is, NAFTA and factors surrounding it have a clean, technology-related dynamic that will contribute to growth and a dirty, policy-related dynamic that will retard it. Despite their absence from most debates about NAFTA, it is these two conflicting dynamics that are most likely to lead to NAFTA's most important impacts.

While I shall conclude this article with discussions of the clean and dirty dynamics, the first order of business is to clarify what NAFTA is about in terms of more static conflicts. For even these — despite serving as bases for not only much of modern economics, but as bases for the modeling efforts that indirectly informed both sides of most NAFTA debates — have rarely been addressed in full detail in most discussions of the agreement.

I. What Trade Policy Isn't About

Although most televised NAFTA debates involved much job counting, the few hundred thousand five-or-ten-year gains or losses claimed by even the most histrionic speakers would be little noticed in a United States that typically adds two hundred thousand workers in a strong month, loses as many in a weak month, and employs more than 115 million persons in any case. After all, from start to finish, implementing NAFTA will take fifteen years.

Moreover, even if NAFTA's job gains or losses were ten times as large as alleged, the

* Opinions expressed in this article do not represent and are not necessarily consistant with those of the Federal Reserve Bank of Dallas or of the Federal Reserve System.

arguments pursued about them were on both sides misleading. Despite the importance of employment-related policies in many countries and despite the significance of technological change in redistributing the industry-by-industry demand for labor, the largest long-term influence on the overall number of jobs is simply the number of workers there are to fill them.

To clarify this allegation's implications for trade liberalization, it is useful to compare trade liberalization with technological change. New technologies routinely reroute demand from existing companies and industries to new ones. On the upside, winners increase sales and add jobs. On the downside, losers find their customers are buying less, and they lay off workers. There is no guarantee that everyone who loses a job will find a new one quickly or a better one ever. Technological change means mismatches between old skills and new job requirements. Even when workers do end up with better jobs, transitional unemployment occurs as workers shift from one job to another.

The profundity with which both technological and organizational fluctuations routinely result in employment turnover, but allow the replacement of one job with another, seems little appreciated. Even in periods of economic weakness, job gains quickly offset most job losses. For example, a study of the Dallas area showed that over the period 1986-1989, 26.7 percent of all jobs disappeared. Nevertheless, even within this period of energy, financial, and construction industry disarray in the region, the disappearance of 26.7 percent of all jobs was largely offset by the appearance of new types of jobs for all but 3.1 percent of the workforce. That is, in the midst of economic problems in the region, a 26.7 percent decline in jobs was largely offset by a simultaneous increase of 24.4 percent.[1] Since that period, as the process of destruction and creation has occurred, the net decline has been replaced by a net increase. Not only in the long run, but usually even in the medium term, the number of jobs is largely determined by the number of workers.

Meanwhile, because of the increasing productivity built into technological change, average worker income goes up even after adjustment for those who have difficulty in finding work. More buying power typically means more buying.

While these events are artifacts of technological change, it is important to appreciate that trade liberalization is nothing more than a change in policy technology. As can be more fully appreciated when this discussion turns to the efficiency implications of trade liberalization, alterations in productivity due to trade liberalization are analogous productivity advances caused by what people more typically think of as technological change — the invention of a new machine to replace an old one, or the invention of a new product that offers the benefits of an old one plus something more. Like other forms of technological change, trade liberalization does not decide the overall number of jobs so much as it decides what kinds of jobs will be in the number.

There are other issues that trade policy is also not about. While some participants in public forums argued that opening to Mexico would aggravate the United States' ongoing trade deficit, and others cited Mexico's recently large trade deficits with the United States, trade policy paradoxically does not affect trade balances very much over the long run. The relation between a nation's saving and overall public and private spending patterns affects trade balances much more. If the public or private sector pursues deficit spending, and the

1. For a fuller statistical and analytical development of these issues, *see* W. Michael Cox & Richard Alm, *The Churn: The Paradox of Progress* (Federal Reserve Bank of Dallas 1992 Annual Report).

capital to fund it all comes from abroad because domestic savers do not save enough, then the nation will run a trade deficit.

Political orators often speak about international trade in ways they would be less likely to consider when addressing their own home budgets; they rarely articulate that what comes in as borrowing almost automatically goes out as spending. Trade policy helps somewhat to decide which particular products we import or export but has much less to do with how much we import or export overall.

II. What Trade Policy Is About

One of the complaints economists typically offer about trade protectionism is that it incites a misallocation of capital and labor. Because they bestow captive markets, protectionist policies — whether they involve tariffs, quotas, import licenses, or more artfully-disguised avenues such as health and safety regulations — cause certain industries to earn higher returns than they would if they had to compete fully in world markets. After all, firms that do not have to compete can charge higher prices than those that do. These artificially high returns attract labor and capital away from uses that are more productive by some measures but — compared with the special environment in which protected industries live — less profitable.

A related issue, although it was rarely addressed directly in any NAFTA-related forums, is the consumer cost of protectionism through higher-than-competitive prices. For a group of twenty-one protected U.S. industries, Hufbauer and Elliott[2] estimate that the average annual cost to consumers of protecting a job by means of trade barriers in 1990 was $169,834 — including $187,179 per worker in the canned tuna industry, $138,666 per apparel worker, and $1,430,556 for a worker in the organic chemicals industry.

Although trade policy has little long-run effect on overall employment, some economists have examined the impacts of protectionism for employment, rather than consumer cost per job, in particular industries. Denzau[3] estimated that a proposed 15 percent steel import quota would save 26,000 steelworkers jobs at the cost of an 8.9 percent price increase. However, the resulting higher costs for industries that use steel would lower demand for their products sufficiently to reduce their workforces by 93,000 jobs. The 93,000 steel-using industry jobs lost, together with the 26,000 steel industry jobs saved, would result in a net loss of 67,000 jobs collectively in steel-related industries. Neither protectionism nor free trade will affect the long-run overall number of jobs in a country but, within some industry groups, using protectionism to save jobs is like fishing with dynamite. You can destroy a lot more than you catch.

When a country liberalizes its trade policies so that domestic markets are no longer captive, a redistribution of who does what where takes place. It is the oldest of economic saws that a country tends to produce most cheaply — and so to export — goods and services whose production involves inputs the country has in relative abundance. When international trade becomes freer, countries specialize more intensely in such production — where they have a comparative advantage — and import what other countries produce rel-

2. Gary C. Hufbauer & Kimberly Ann Elliott, *Measuring the Costs of Protection in the United States*, Institute for International Economics (1994).
3. Arthur T. Denzau, *American Steel: Responding to Foreign Competition*, Center for the Study of American Business, Washington University, Formal Publication #66 (Feb. 1985).

atively more efficiently. This is why NAFTA means that Mexico will likely specialize more fully in production that uses relatively low-skilled labor and the United States will specialize more fully in what requires more highly skilled labor.[4]

Economic theory suggests that this geographical redistribution of production increases efficiency in all countries involved in a trade liberalization. But what do economists mean when they say something increases efficiency? A country has increased its economic efficiency if it can now produce more than before without using more resources. Removing trade barriers increases efficiency because resources devoted to less productive (but, thanks to government impediments to the discipline of competition, profitable) enterprises before liberalization will now be devoted to more productive enterprises. Again, the result is more output with the same batch of resources.

III. What NAFTA Is About And Isn't About

These same issues — efficiency and the geographical redistribution of production and of demand for labor — are not only at the heart of most formal studies of the economics of NAFTA but of the controversies between them. Even so, in considering the competing narratives about NAFTA, what does not receive attention may be at least as important as what does. Even most serious studies of NAFTA ignore many of the dynamic aspects of the economics of NAFTA — including what NAFTA itself may motivate directly and what peculiar dynamics NAFTA may trigger in technology development. I shall first discuss what competing narratives about NAFTA address and, then, what they do not talk about.

Basic to the typical econometric or other statistically-based characterization of the impacts of NAFTA is the notion of efficiency gains — in the sense that I have discussed them above. Countries reorganize production so that a nation with a preponderance of low-skilled workers specializes in producing whatever requires a lot of them, while a nation with plenty of high-skilled workers makes whatever requires a lot of them. Such a characterization is the model of Brown, Deardorff, and Stern[5] which shows — under various assumptions about capital mobility — increases in Mexican output ranging from 2.2 to 5.4 percent and increases for the United States in the area of 0.1 percent. Canada's increase is about 0.7 percent.

Since this discussion involves the role of efficiency in the economics of NAFTA, a detail of efficiency measurement that surfaced in NAFTA-related debates deserves attention. Ross Perot, for example, made much over what he and his co-author, Pat Choate, characterized as "most" models' "unrealistic assumptions" of full employment.[6]

Perot and Choate were right. Some models did assume full employment. Others did not.[7] But it is entertaining to understand why the issue is not as important for most econ-

4. Note that this is quite a different argument from the allegation that Mexico's lower wages mean a giant sucking sound of jobs going to Mexico.
5. Drusilla K. Brown et al., *Estimates of a North American Free Trade Agreement* (unpublished manuscript, on file with the Federal Reserve Bank of Minneapolis, 1994).
6. Ross Perot & Pat Choate, *Save Your Job, Save Our Country: Why NAFTA Must Be Stopped — Now!*, 66 (Hyperion 1993).
7 *See* Drusilla K. Brown, *The Impact of a North American Free Trade Area: Applied General Equilibrium Models*, NORTH AMERICAN FREE TRADE: ASSESSING THE IMPACT, (Nora Lustig et al. eds., 1992) for a considerably more elaborate discussion of this issue.

omists as it is for someone whose principal credo is that once you lose one job, you are unlikely ever to get another. When the focus is on whether or not output changes will occur as a result of production reorganization, a modeler gets the same income or output result by assuming employment is fixed (full) but wages are variable or that wages are fixed and employment is variable.

Although economic models that do allow changes in employment typically offer results that include employment growth in the United States[8,9] while those that allow changes in wages[10,11] typically offer results that include increases in wages, the principal focus is on gross domestic product and it typically increases.[12,13,14,15,16]

These findings should not suggest that any economic study finds that NAFTA is at all times in everyone's best interest. NAFTA advocates often talked around this issue when their debating opponents persisted in bringing it up. But there is a substantial literature in economics to the effect that long-lived industry-by-industry redistributions of demand for labor result in temporary increases in the rate of unemployment when job search is time-consuming and costly — which it typically is in the real world. According to this literature, these redistributions can result in increasing unemployment even when a country is growing on net and sometimes even when it is growing on gross. Even when their effects on gross domestic product are positive, this is just the sort of redistribution that trade openings motivate and that — despite these effects that clearly deserve to be addressed socially — we expect and want them to motivate.

While this artifact of industrial reorganization is important, one of the most highly regarded (by economists, rather than rhetoreticians) studies[17] consistently used as ammunition by NAFTA opponents addresses a rather different issue. Leamer constructed his model in accordance with Stolper-Samuelson theory. Stolper-Samuelson theory is consistent with the idea that: (1) Countries produce most efficiently and cheaply the product mix whose technology requires their most abundant resources — low skilled labor in Mexico, or high-skilled labor in the United States. (2) The efficiency-enhancing geographic redistributions of production in response to trade liberalization mean that the low-skilled-labor-abundant country will produce more products requiring low-skilled labor. (3) While

8. David Roland-Holst et al., *North American Free Trade, Liberalization, and the Role of Nontariff Barriers*, Mills College (Apr. 1992).
9. Clopper Almon, *Industrial Effects of a Free Trade Agreement between Mexico and the U.S.A.*, Interindustry Economic Research Fund, Inc. (1990).
10. Brown, *supra* note 6.
11. Raul Hinojosa-Ojeda & Sherman Robinson, *Alternative Scenarios of U.S. Mexico Integration: A Computable General Equilibrium Approach*, University of California — Berkeley (Oct. 1991).
12. Almon, *supra* note 8.
13. Brown, *supra* note 4.
14. Raul Hinojosa-Ojeda & Robert K. McCleery, *U.S.-Mexico Interdependence, Social Pacts, and Policy Alternatives: A Computable General Equilibrium Approach*, University of California — Berkeley (Oct. 1990).
15. Hinojosa-Ojeda, *supra* note 10.
16. Roland-Holst, *supra* note 7.
17. Edward E. Leamer, *Wage Effects of a U.S.-Mexican Free Trade Agreement* (National Bureau of Economic Research Working Paper No. 391, Feb. 1992).

the high-skilled-labor-abundant country will turn out more products requiring high-skilled labor, it will turn away from producing what requires much low skilled labor. Leamer's estimation model assumes that, ultimately, Mexico's economy becomes large relative to the United States. If that ever happens, Leamer's result is that the decline in demand for low-skilled U.S. labor could be large enough to lower low-skilled wages in the United States. Leamer posits low-skilled labor earnings reductions of $1000 per year although, as Hinojosa-Ojeda and Robinson note, "the underlying driving scenario that Mexico becomes large relative to the United States...has to be seen as a very long-run projection."[18]

In another well-regarded work that addresses NAFTA-related problems for some groups, Hinojosa and McCleery's "results point to a long run and societywide superiority of increased exchange while also revealing a short run dilemma for workers' welfare which poses serious obstacles to the neo-liberal approach to greater exchange."[19] The authors also note — to the probable disappointment of NAFTA opponents — that their model shows that "the protectionist alternative emerges as the worst long term welfare option for most workers groups in both countries..."[20]

Some other studies that pay much attention to the negative economic implications of NAFTA seem less systematic and careful. Faux and Lee,[21] for example, allege a contradiction between the typical claim that NAFTA will result in higher paying jobs and the experience that U.S. workers displaced by trade openings move down the ladder to lower paying jobs or off the ladder to unemployment.

Despite Faux and Lee's claims to the contrary, these two allegations are not contradictory. If NAFTA means the United States increases production involving high-skilled labor and Mexico increases production involving lower-skilled labor, we would expect both phenomena presented by Faux and Lee and should be prepared for them.

Although some NAFTA studies that stress short-or long-term wage softness for U.S. low-skilled workers also show net output gains, others present an unrelievedly dark picture for the United States; it is important to show why they do, since the assumptions behind such studies will likely be used by opponents of any future U.S. trade openings.

Koechlin and Larudee[22] conclude that NAFTA generates an increase in U.S. investment in Mexico of $3.5 billion to $5.9 billion per year, or $31 to $53 billion cumulatively over the period 1992-2000. These estimates are extrapolated from the increases in direct foreign investment received by Ireland and Spain after their accession to the EC. Many models, in fact, include estimates that accommodate increased investment in Mexico, but Koechlein and Larudee also assume a corresponding decline in U.S. investment and estimate a resulting reduction of between 290,000 and 490,000 jobs through the year 2000.

18. Hinojosa-Ojeda, *supra* note 10, at 87.
19. Hinojosa-Ojeda, *supra* note 13, at 37.
20. *Id.* at 38.
21. Jeff Faux and Thea Lee, *The Effect of George Bush's NAFTA On American Workers: Ladder Up or Ladder Down?* (1992) (briefing paper on file with the Economic Policy Institute).
22. Timothy Koechlin and Mehrene Larudee, *Effect of the North American Free Trade Agreement on Investment, Employment, and Wages in Mexico and the U.S.*, Skidmore College Working Paper Series, Dep. of Eco. paper, 126-93 (1993).

While their investment estimates are extrapolations of the Spanish and Irish experiences, they ignore the rise in direct foreign investment that occurred in the rich EC countries at the same time as a result of the increased prospects for growth due to freer international markets.

Cypher[23] uses the same general assumption to conclude that by 1997, 220,000 U.S. jobs will disappear utterly, headed for Mexico. He compounds the problem by assuming, apparently, that capital goods investments made in Mexico will not involve capital goods produced by the United States, even though capital goods commonly represent one of the United States' chief export products to much of the world, including Mexico. Faux and Lee[24] use the same zero sum investment assumption — that each extra dollar going to an investment in Mexico means one less dollar going to investment in the United States — to reach qualitatively similar conclusions.

The every-extra-investment-dollar-to-Mexico-means-a-dollar-less-U.S.-investment argument receives special attention in Hinojosa-Ojeda and Robinson,[25] who note that typical forecasts for the United States (not NAFTA studies) suggest significant macroeconomic adjustments over the next decade with a large decline in the U.S. current account deficit. They argue that "projected changes in U.S. investment in Mexico are tiny compared with these shifts...." and that "the changes in U.S. investment in Mexico postulated by Koechlin and others represent a tiny part of the U.S. capital market...." and conclude that there "is no theoretical or empirical reason to think that these investment changes will have any effect at all on aggregate investment" in the United States.[26]

IV. What Seems to Have Been Missed About NAFTA

Despite the counterexamples of Cypher, Faux and Lee, and Koechlin and Larudee, models of the economic effects of NAFTA typically show relatively small percentage net gains (at best, a few tenths of a percentage point) in output for the United States, somewhat larger percentage gains for Canada, and still larger percentage gains for Mexico. These conclusions are fairly consistent across a wide variety of assumptions about the nature of capital flows to Mexico. However, a common theme of these models is that "the overall impact of a formal North American Free Trade Agreement is modest for each of the three countries"[27] and that in some models that characterize changes in income, real wages, migration, exports, imports, and capital stock, the statistical error or "noise would over-

23. James M. Cypher, *Estimating the Impact of the U.S.-Mexico Free Trade Agreement on Industrial Labor*, THE NORTH AMERICAN FREE TRADE AGREEMENT: LABOR, INDUSTRY, AND GOVERNMENT PERSPECTIVES 85-96, (Mario F. Bognanno and Kathryn J. Ready, eds.).
24. Faux, *supra* note 20.
25. Raul Hinojosa-Ojeda and Sherman Robinson, *Labor Issues in a North American Free Trade Area*, in NORTH AMERICAN FREE TRADE: ASSESSING THE IMPACT, (Nora Lustig et al. eds., 1992).
26. *Id.* at 85.
27. Barry Bosworth et al., *Introduction*, in *North American Free Trade: Assessing the Impact*, 9, (Nora Lustig et al. eds., 1992).

whelm the percentage changes."[28] But perhaps the assumptions behind all of these models are too timid. The models discussed give little, if any, attention to the dynamic processes to be addressed in the following section.

V. The Clean Dynamic of NAFTA

The clean dynamic of NAFTA involves not simply a once-and-for-all jump in output due to trade liberalization, but an accelerated growth rate due in part to greater opportunities for technological development, with one process building on another. In discussing what trade is not about, I drew an analogy between technological changes and policy changes and then claimed that a change in policy can be reasonably viewed as a change in a certain type of technology.

However, trade openings like NAFTA not only signify a change in policy technology but can also mean changes in what people think of as technology in the more conventional sense. One important detail of the economics of NAFTA that has already been noted but deserves further clarification is that — since NAFTA means a geographic redistribution of productive activity — NAFTA also means new investment will take place and therefore that new plant and equipment with new technology will appear.

But there is an illuminating point of the connection between modernization and trade opening that is less obvious. Using a survey of more than 3,000 Brazilian companies, Braga and Willmore[29] found that the higher the tariff and non-tariff barriers that protected a company from international competition, the less the company was likely to spend either on developing its own technology or on buying technology from someone else. In sum, firms that do not have to compete much do not innovate much.

If Braga and Willmore's analysis of Brazilian firms has any relevance at all to business practices in the rest of the world, then as NAFTA intensifies the competition that Canadian, Mexican and U.S. firms receive from one another, they will be motivated to accelerate their own technological development or to make sure they get the latest that someone else has to sell.

Accordingly, besides efficiency gains from trade in existing products made by existing methods — gains that come simply because an already-efficient firm that could not get into certain markets can now get into them — NAFTA signifies added increases in efficiency through technological advance. That is, increased competition means that the already-efficient foreign firm prepared for new markets may find formerly inefficient domestic firms with new techniques of their own.

An example is what has lately been taking place in the Mexican banking industry. In addressing this issue, it is useful to distinguish how protectionism operates in service industries from how it operates in goods industries. A moment's reflection will reveal that trade protectionism for goods typically constitutes an attack on foreign products, rather

28. Sidney Weintraub, *The North American Free Trade Debate*, The Washington Quarterly, Autumn 1990, at 97.

29. Helson Braga & Larry N. Willmore, *Technological Imports and Technological Effort: An Analysis of Their Determinants in Brazilian Firms*, The Journal of Industrial Economics, XXXIX (June) at 4210433.

than on foreign producers. Under trade protectionism, foreign-made goods are subjected to tariffs or other special and discriminatory taxes. The importation of foreign products is routinely subjected to quotas and or import licenses. Under trade protectionism in goods, the producer is far less likely to be attacked as a policy tactic. Indeed, under the philosophy of import substitution/industrialization, the same developing countries that used trade barriers to discourage foreign goods imports were prepared to offer financial incentives to the foreign producers of these goods — if only they would set up production in the developing countries and sell the locally-made goods there.

By contrast, protectionism in trade in services more commonly constitutes an attack on the firm, rather than the product. Foreign firms may be prohibited from operating in certain service industries. Even more restrictively, a pure monopoly may be bestowed on some domestic producer. In the case of Mexico's banking industry, foreign banks were effectively forbidden from operating as such in Mexico until 1994.[30]

In the Mexican banking sector, protectionist policies had their typical result. Regardless of ownership, Mexico's banking system, which was nationalized in 1982, has been much more highly concentrated than its U.S. counterpart. As of mid-1992, the three largest commercial banks in Mexico held about three-fifths of all Mexican commercial bank assets, while the three largest U.S. banks held about one-seventh of U.S. commercial bank assets. Moreover, by most measures, Mexico operated more profitably yet less efficiently than their U.S. counterparts. The system appeared not to be very competitive.[31]

Mexico began to sell off its publicly-owned banks in 1991 and sold the last of them in mid-1992. Privatization of the banks did not make the industry suddenly more competitive, so the Mexican government quickly opened the banking system to new domestic applicants, who were not at all slow in coming. Then, with the advent of NAFTA, Mexico began to allow foreign banks to establish themselves as full-service operations — taking peso-denominated deposits as well as making loans.

Mexico's banking technology in recent years has, in comparison with what has been used in the United States and Canada, not been very up-to-date. But the onset of competition from new Mexican applicants, as well as from foreigners, has been accompanied by the adoption by traditional Mexican banks of technologies that have long since been in place in the other NAFTA countries.

As an example, Mexican banks had lacked a well-developed credit reporting system to facilitate their credit card and consumer loan operations. But as the threat of competition began to appear in Mexico, domestic financial groups began to take steps not only to bring in credit reporting systems but to arrange for their introduction by such traditional U.S. operators as TRW. We will know that the next step has been taken when Mexican banks begin to develop technologies of their own, only to see them adopted by Canadian and U.S. firms.

The various facets of the synergy between trade openings like NAFTA and technological change — as they join together to generate growth — are well-documented in the liter-

30. Citibank was allowed to operate under a grandfather clause, but other banking institutions were restricted to the operation of representative offices.

31. William C. Gruben, et al., *U.S. Banks, Competition, and the Mexican Banking System: How Much Will NAFTA Matter?* (Federal Reserve Bank of Dallas Research Department Working Paper 94-10, 1994).

ature of economics. In the work of Rivera-Batiz and Romer[32] economic integration accelerates growth rates, and closer integration is achieved by increasing trade in goods or by increasing flows of ideas. The implications for an agreement like NAFTA are particularly important. Agreements that liberalize trade typically increase trade in goods, but NAFTA's special openings for trade in services and its provisions for intellectual property protection also signify opportunities for increased flows of ideas.[33]

Following a related strand of research, Gould and Ruffin[34] show that educational levels have a stronger influence on growth in countries with liberalized trade than in trade-protectionist countries. What does this tell us about the trade-related growth dynamics of technological change? As Gould and Ruffin discuss, the act of opening trade turns out to be tantamount to increasing the flow of ideas. The ability of a country to increase its own productivity from this increased international flow of ideas will depend on the educational level of its workforce. Conversely, education offers fewer growth benefits in countries with trade protectionism because trade protectionism restricts the international flow of ideas on which subsequent innovations are based.

Romer[35] illuminates these narratives by clarifying how — particularly in developing countries — trade protectionism can foreclose on the development of certain products and technologies while trade openings can motivate such development. The dynamics of this process — one product leading to another — is absent from any of the estimation models I have discussed.[36]

Further pursuing the idea of an ongoing synergy between trade openings and technological change, Gould and Gruben[37] test an hypothesis drawn from Braga and Willmore's[38] findings on the inverse connection between trade protectionism and technology use —

32. Luis A. Rivera-Batiz & Paul M. Romer, *Economic Integration and Endogenous Growth*, 5 Q.J. of Econ. 531-555 (1991).
33. Mexico had already reconstructed its intellectual property regime before NAFTA, in 1991 and Mexico's 1989 liberalization of its foreign investment law mean that much of what will facilitate trade in these areas is not really NAFTA, although NAFTA clearly opens Mexico further to U.S. and Canadian investment. Since trade in services commonly involves location of the seller near the buyer, liberalization of foreign investment regimes has particular importance for trade in services. Here, it is very important to note that modern trade in services is — to a greater extent than such trade was a few decades ago — involved with the flow of ideas.
34. David M. Gould and Roy Ruffin, *Human Capital, Trade and Economic Growth*, forthcoming in WELTWIRTSCHAFTLICHES ARCHIV.
35. Paul M. Romer, *New Goods, Old Theory, and the Welfare Costs of Trade Restrictions*, 43 J. DEV. ECON. 5-38 (1994).
36. Weintraub, *supra* note 27, however, addresses in some detail certain related dynamics, although they are not the same. Some models also accommodate them. To wit, scale effects motivate increases in productivity (say) in Mexican Industry A, which allow it not only to increase its exports but also to lower its product prices when selling inputs to Mexican Industry B. This decline in prices motivates a redistribution of input composition in Industry B, so that B's exports now become viable.
37. William C. Gruben and David M. Gould, *The Role of Intellectual Property Rights in Economic Growth* (Federal Reserve Bank of Dallas Research Department Working Paper 94-09, 1994).
38. Braga, *supra* note 28.

together with Sherwood's[39] survey evidence that firms in countries with weak intellectual property protection have difficulty purchasing technology because sellers worry about contract enforceability. Arguing that increased competition from trade openings means firms will want to develop or buy higher technology — but will be less likely to take either step without intellectual property protection — they hypothesize that intellectual property protection will contribute more to growth in countries with open trade regimes than in those with heavy trade protection. It is important to understand that, here also, the issue at hand is a higher growth rate rather than a once-and-for-all jump in output. They find econometric evidence to support their case.

VI. The Dirty Dynamic of NAFTA

But along with the NAFTA's positive or clean dynamic, there is a dirty one. It is common in discussions of NAFTA to speak as if, now that the agreement has been signed, it will remain in place much as it is today. There is much evidence to suggest, however, that protectionists organizations are not only prepared to attempt to erode its effects but that they have already begun the job. The idea not so much of eroding NAFTA, but of its effects, is particularly important. The effects of NAFTA per se are conditioned by other avenues for countervailing protectionism. NAFTA does not stop the imaginative expression of protectionism through countervailing duties and antidumping, for example. And since the rules applicable to such actions are subject to change, just these avenues by themselves have what could turn out to be a dirty dynamic.

But this claim ignores the possibility of technological innovations in protectionism that have not even been envisioned. To appreciate both such efforts — the imagined and the as-yet-to-be imagined — as part of a dirty dynamic, it is useful to consider the literature of what is called endogenous policy theory and to begin the consideration with what is called the *compensation effect.*[40] The idea of the compensation effect is that an industry or group turns to politics for relief when its economic fortunes decline. This is a simple economic argument. When the rate of return to lobbying for protectionism exceeds the rate of return to other efforts, lobbying becomes the effort of choice.

These allegations represent not only common sense but, in some circles, common knowledge. At U.S. congressional hearings in preparation for what became NAFTA, one Mexican businessman noted his concern that "there has been a past pattern of the United States increasing trade barriers whenever Mexico becomes competitive in a particular industry."[41] (USITC, 1990, pp. 1-3).

An important consideration here is that those who lobbied against NAFTA and failed will now devote themselves to stopping its effects. Meanwhile, some industries or groups who were not fully sensitive to what NAFTA's effects would be for them may now devote more effort and imagination to undermining it.

Here it is useful to contemplate the implications of the clean dynamic for the dirty dynamic. As the dynamics, either of the technology-based process characterized in the pre-

39. Robert M. Sherwood, INTELLECTUAL PROPERTY AND ECONOMIC DEVELOPMENT (Westview Press 1990).
40. William A. Brock, et al., BLACK HOLE TARIFFS AND ENDOGENOUS POLICY THEORY: POLITICAL ECONOMY IN GENERAL EQUILIBRIUM (Cambridge University Press 1989).
41. *Review of Trade and Investment Liberalization by Mexico and Prospects for Future United States Mexican Relations: Phase I,* USITC (Apr. 1990).

vious section or of the scale-based growth process characterized in note seven, set in motion cost and price readjustments, groups caught out in the competitive cold will respond. I again turn to the work of Brock, Magee, and Young[42] for illumination on these efforts, this time out of regard for their *voter information paradox.*

The voter information paradox is that, as voter opposition to protectionism becomes increasingly sophisticated, political parties respond with higher equilibrium levels of more opaque distortions. The twentieth century history of trade liberalization is a history of this paradox. When international accords knock down tariff walls, quotas appear. When newer agreements constrain the use of quotas, "voluntary" export restraints materialize. The development of such protectionist innovations may accelerate as rates of return to protectionism rise. Rising imports from Mexico increase the returns to protective innovation in Canada and the United States, just as rising imports from the United States increase the returns to protective innovation in Mexico and Canada. And who really knows quite where the dynamic will lead?[43]

We already know where some of the responses to the dynamic have led. As Mexico has pulled nearly even with Japan as the United States' second-largest export market — behind Canada — industry groups have successfully put pressure on their governments to impose new protection for the steel, meat, dairy, cement, and lumber industries, among others. Health and safety as well as labeling rules have begun to serve as substitutes for tariffs, import licenses, and quotas.

These nontariff barriers are at least, in terms of their intentions, relatively transparent. What makes the dirty dynamic more powerful and compelling is not only its connection with the clean dynamic, but also with the voter information paradox. That is, as competitive pressures in one country create motivations for protectionists, they will create motivations for subterfuge. As NAFTA grows older, efforts at its erosion will not only continue and grow, but innovations will make the erosion more difficult to identify and accordingly more difficult to address. That is what makes the dynamic dirty.

VII. Conclusion

In sum, one of the principal determinants of our inability to predict very accurately the impacts of NAFTA is the unpredictability of the details of buman inventiveness. In addition to the static efficiency gains from trade, we know that there is an efficiency dynamic at work. We know generally that freer trade means increased flows of information, and that increased flows of information mean more innovation. We know that increased innovation means greater efficiency. Finally, we know that all of these factors together mean faster economic growth.

42. Brock, *supra* note 38.

43. I state this question pointedly, because the expectations of many modelers of U.S.-Mexico trade have been proven wrong, repeatedly. For example, analysts typically posit that the Mexican clothing industry would gain from freer trade with the United States. But work by Gordon Hansen (noted in Piore, 1992) shows that Mexico, despite its labor cost advantages, cannot compete even domestically on the basis of quality or fashion and that the industry has been swamped by imports. Domestic producers who attempt to find new markets are handicapped by their general ignorance of where potential markets are, and by lack of familiarity with the formalities of contracting in international trade.

But that is only one side of human inventiveness. We also know that there are winners and losers from both trade, innovation, and the interaction of the two. We know that the losers' inventiveness will sometimes be expressed in the development of new and ever more hidden forms of protectionism. The more the losers lose, the greater will be their rewards for stopping open trade and, therefore, the greater will be their efforts.

As a result, international accords like NAFTA present us with a dualism that is less common in economics than in mythology, where the same god who is pleased to create something is also pleased to destroy it. Freer trade in general, and the growth-accelerating clean dynamic in particular, create the pressures that arouse the dirty dynamic. In turn, the workings of the dirty dynamic present us with new incentives to get the clean dynamic working faster. After all, the more protectionism exists, the greater the payoff for getting rid of it. We cannot know the effects of NAFTA without understanding the trajectories of each of these dynamics, and we do not understand them.

What we can understand, however, is that this all means NAFTA itself is a process and not a static product. After all, NAFTA exists in the context of policies that reflect these pressures and is, itself, a policy that reflects these pressures. That is the real dynamic of NAFTA.

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