UNMADE IN AMERICA
The true cost of a global assembly line
By Barry Lynn

When Congress summoned Enron's top executives this February and made them sit, hands folded, in front of the TV cameras, we at home were treated to a familiar display of Washington theater. Because most of these men had invoked their Fifth Amendment right not to incriminate themselves, no one expected much new information to be revealed. But our congressmen certainly were not going to let pass a chance to broadcast to the world their indignation at the gross mismanagement of a company that had once been so powerful, and so generous. Even at the highest pitch of their fury, however, few of the legislators could actually say that what the executives had done was illegal. Although the erstwhile pipeline company had certainly become more skilled at pumping debt into subterranean partnerships than at earning money by pumping petroleum, it was not clear that any of Enron's bosses had in fact overstepped the bounds Congress had set for the conduct of their business. But then this was not the first time our elected representatives had publicly chastised one of their children for smashing the car, knowing full well that they themselves had liquorod the kid up beforehand and slipped him the keys.

What most amazed me was not the elasticity with which Democrats and Republicans alike twisted their faces into expressions of outrage. Rather, it was that a risk to the nation so very analogous to Enron, yet potentially so much more dangerous, was, and still is, being ignored by these same public servants. Then again, it's easy to sting up a single bad Andrew Fastow, or a disingenuous Jeffrey Skilling or Kenneth Lay. But what's a government to do when a whole generation of corporations prove prodigal?

Out of sight, out of mind, or so seems the philosophy these days at Texas corporations and Georgia crematoriums. But this only works for a while. Eventually a neighbor's dog yanks some nasty treat onto the road. Or a few billion dollars in vanished debt leaches up through a Houston swamp. So we might as well prepare ourselves now for similar revelations, one of these days, about our "global" manufacturers. Much as Enron spent the 1990s

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Shifting debt off its books, America's manufacturers spent these same happy years shifting many basic operations right off their factory floors. And by this I don't mean simply offshore but right out of the company, along with the responsibility to make sure their world-spanning assembly lines always run right. Like Enron, our manufacturers did so largely to pump up the value of their stocks. And, like Enron, they will probably get to watch one day as their empty edifices collapse. Unlike Enron, however, this crash may bring down a lot more with it than one or a few companies. The global assembly lines that manufacturers such as Dell, Ford, Motorola, and Intel have so expertly engineered these last few years—in which, say, a single semiconductor might be cut from a wafer in Taiwan, assembled in the Philippines, tested in China, fit into a subcomponent in Malaysia, plugged into a component in Brazil, and loaded with a program designed in India—are just as audaciously complicated as any of Enron's financial schemes. Yet because manufactured goods are so much less fungible than money, these systems are vastly more vulnerable to the mysterious murmuring of God or the deliberate hand of man and state. We now live in a world where a single earthquake, or terrorist attack, or embargo, could in a moment bring our economy to a halt and, if played right by some smart state, might well threaten the very foundations of our national wealth and power. And for this we received what? A few thousand points on the Dow? A half-percent uptick in annual productivity growth? A capital gain, as it were, on every 1040?

And I suppose we will be treated to another fine show from the Thespian Club on the Potomac. This time, however, it will play as tragedy.

Globalization is many things, and much has been written about it and said. But throw all the tomes and studies and placards into a giant try works, and you'll render two simple arguments:

(1) Globalization is good because it spreads what is good in America, such as a liberal approach to business, and McDonald's.

(2) Globalization is bad because it spreads what is worst about America, such as a liberal approach to business, and McDonald's.

But while so much energy was spent these last few years studying the extent to which the Happy Meal affects a nation's quality of life, hardly anyone bothered to examine in depth the fundamental changes that were taking place in the nature of the manufacturing corporation, and in the nature of manufacturing itself, as thousands of companies scrambled to adapt themselves to a world radically remade by the sudden economic opening of dozens of countries and the simultaneous arrival of the information age.

Watch one of the new commercials for UPS and it's hard not to feel inspired by the images of all those jets full of cargo ricocheting round the world, round the clock. Whether Chevrolet fuel pump, Baxter intravenous-infusion pump, or Ralph Lauren's faux-lizard pump, the average modern product contains parts that are more well traveled than are most of us. After conception in a design studio—perhaps in Detroit, perhaps in Milan—these components embark on the modern equivalent of a Grand Tour. East Asia, South America, Eastern Europe, Southeast Asia, Central America—all the premier destinations of the developing world may be visited before the product makes its way at last to the final assembly line somewhere, perhaps, in North America. But, even as the corporations celebrate with their 30-second symphonies the rise of the globalized industrial network, almost no one asks what would happen if just one of the still very sovereign nations that underlie this web were to grab hold of a few of the strands and start yanking. Almost no one studies how "our" corporations have quite literally manufactured new forms of foreign dependence for the United States that may soon leave us gazing fondly back to the days when our nation was joined at the aorta only to such dear fellow citizens of the world as Saudi Arabia and Venezuela.

Much as Enron was the most cocksure of the elite club of trading corpo-
rations, so is Dell Computer the perfect archetype of the post-national manufacturer. Dell assembles its OptiPlex business desktop at the Topler Manufacturing Center in Austin, Texas. The operation is relentless, the plant floor a tight maze of conveyor belts and elevators amidst which men and women work, often hidden from view, in nest-like workstations or "build cells." For eight or more hours each day, the employees on the line face terror. From the moment an elevator delivers a tray loaded with a half-made computer until the moment the elevator returns to take the tray back to the overhead conveyor line, a worker has only one to three minutes to install his or her components. Drop goggles in the elevator gearing and the light atop the workstation will blink green to red. Since Dell's success depends at least as much on the efficiency of its processes as on the quality of its product, nothing is dreaded more than a red light.

These days, Dell's anxiety is not limited merely to the smooth functioning of its North American plants. The modern Dell assembly line actually stretches out far past the trucks parked at the delivery dock and down Interstate 10 to the monitor plants of Tijuana. And it stretches back through Dallas/Fort Worth International Airport to the component manufacturers strung from Malaysia to Korea and clustered especially thickly in Taiwan and China. From those suppliers it stretches on back through another three or four "tiers" to the subsuppliers and sub-subsuppliers. To ensure green lights at all points along this line, Dell logisticians must watch hundreds of potential bottlenecks around the world, as some 4,500 parts from hundreds of suppliers make their way to Austin, Texas. On any day, a single missing shipment of components can slow or stop the whole operation.

Five years ago, when Compaq Corporation bestrode the personal-computer industry, manufacturers commonly kept 60 or even 120 days' inventory on hand, and most moved this material from one company-owned plant to another. When Dell passed Compaq last year to become the world's top PC maker, it had trimmed its inventory to four days' worth, and much of that now flows to and from plants owned not by Dell but by companies that supply Dell. In essence, the Dell production model is to cut inventory and other forms of sunk capital as low as possible, largely by relying on other companies to do the manufacturing. To keep pace, Compaq for years has hacked ruthlessly and relentlessly at its own inventory, while following Dell into dependence on components made by Taiwanese and Chinese companies. Yet still Compaq loses ground to Dell, as do the personal-computer divisions of Hewlett-Packard, IBM, and Sony. Which only increases the pressure to cut further or, in the case of Compaq, to give up and sell out to Hewlett-Packard.

Not that electronics firms are alone in playing this game. Even the biggest of traditional "multinational" corporations now operate very differently than when the first George Bush sat in the White House. The ability to sell in more markets, and to manufacture in many more countries, has created two vital imperatives: Corporations must now race against their direct competitors for global scale, which means they must grow so big that another company cannot beat or buy them. And they must keep costs low by structuring their worldwide operations as efficiently as possible. This is what Ford does it, say, it centralizes production of a particular fuel injector at a plant in Brazil while closing similar lines in Michigan and Germany.

Aided by recent radical advances in information management and communications, and by the never-ending
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effort to rethink corporate structure, a growing number of industries have “rationalized” along global lines. This is what happens if, say, General Motors and Daimler-Chrysler hire, perhaps unknowingly, the same fuel-injector manufacturer that Ford relies on in Brazil to manufacture their components as well. In many instances, especially in the electronics industry, such a back-door consolidation has already taken place. Last year, nearly 90 percent of the world’s scanners and most of the world’s computer motherboards were manufactured in Taiwan, many in a single industrial park in Hsinchu.

Some see beauty in this system. In a borderless world, each company and each community can concentrate on what it does best, be it growing artichokes, stamping out motorcycle gears, designing marketing strategies, or engineering global assembly lines. Unfortunately, such concentration—the growing reliance by entire industries on single sources of supply—violates one of the most basic rules of manufacturing, which is always to have an alternative at the ready.

On September 21, 1999, an earthquake measuring 7.6 on the Richter scale killed some 2,500 people in Taiwan. Within days, the stock prices of Dell, Apple, and Hewlett-Packard plummeted as investors focused for a short moment on just how much these companies depend on Taiwan-based factories. Although most of the island’s suppliers were back on line within a week, worldwide orders for electronics in October fell 7 percent. Had the quake been a few tenths of a point stronger, or centered a few miles closer to the vital Hsinchu industrial park, great swaths of the world economy could have been paralyzed for months.

In March 2000, in the midst of Taiwan’s presidential campaign, China threatened war if Taiwanese voters chose the candidate Beijing opposed. Again the stock prices of Dell and other Taiwan-dependent firms dropped, as investors remembered, if only for a moment, the missiles China landed near the island before the 1996 elections and the resulting de facto blockade.

Then came September 12, 2001. Much of the manufacturing activity in the United States came to a halt after the Bush Administration closed U.S. borders and grounded all flights in the wake of the attacks on the World Trade Center and the Pentagon. Ford, Daimler-Chrysler, and Toyota North America were among the companies that shut plants when they found themselves cut off from supplies.

This is not Henry Ford’s vision of manufacturing. Ford’s immense industrial experiment during the 1920s, at the River Rouge complex in Michigan, was revolutionary in that he gathered in one place everything needed to manufacture an automobile. Fed up with poor quality and spotty delivery by outside suppliers, Ford wanted to oversee production of all the parts and components that went into one of his cars: seats, mirrors, and tires as well as engines and chassis. By 1927 ships were unloading iron ore at one end of the complex while employees drove finished Model A’s onto railroad cars at the other. Companies such as General Electric, Westinghouse, and Xerox soon emulated the River Rouge concept. Nothing was too small to make in house. Hewlett-Packard was famous for machining its own screws; Nortel for cooking its own silicon.

Today, we are witnessing the breaking up of empire, the dismantling of the River Rouge concept, as hundreds of vertically integrated manufacturers cast their constituent operations to the far corners of the world. Most start by
off-loading the manufacture of a cheap component or a light assembly operation. Many then go further: In January 2001, mobile-phone maker Ericsson sold off all its manufacturing and transport operations to a Singapore-based company named Flextronics. Even high-end manufacturers such as Sony and IBM can't resist slashing off a factory or two.

How else, really, to compete with a company like Cisco Systems, which in the 1990s grew to be the world's largest manufacturer of communications equipment, and for a time the most highly valued corporation in the world, by operating as a "virtual company." This means that Cisco relies almost entirely on a stable of other companies to do everything from design its chips to manufacture its circuit boards to deliver its Cisco-brand products. The company's role, its executives say, is to exert a sort of postindustrial "Command and Control" over this vast network of outsourced production. Much the same can be said of Dell. Despite the fact that a tiny American flag graces each of the company's Web pages, Dell, in the words of one semiconductor executive, is really little more than "a delivery channel for Taiwanese-made products." Think Wal-Mart, but in place of store shelves jammed with foreign-made toys and towels substitute laptops loaded with foreign-made components: CD-ROM drives and video cards and memory chips.

Executives and consultants have for years debated the wisdom of this disintegration, but there has been no coherent mainstream discussion about whether this scattering leaves the global industrial system—and by extension the entire global economy—more liable to catastrophic shutdowns like the one barely avoided after the Taiwanese quake. At River Rouge, Henry Ford could walk from one end of his operation to the other. At Cisco and Dell, it is unlikely that any employee has visited all the suppliers, and certainly no one has visited all the subsuppliers. If the production of door handles fell behind schedule at River Rouge, Ford could throw on more machines and people, and in the meantime survive out of inventory. These days big manufacturers have almost no inventory on which to rely while they fix any problem, and ever less ability to spot potential bottlenecks in their worldwide supply chains. Until the Taiwan-based TSMC stopped shipping semiconductors after the 1999 quake, for instance, Dell executives knew almost nothing of their dependence on the chipmaker, because the actual purchases were made not by Dell but by Dell's suppliers.

Our modern faith in globalization was founded, at least in part, on the premise that it was the right thing to do. We were outmaneuvering the Europeans and Japanese for new export markets. Better yet, American investments abroad would spread skills and wealth among the beggared and benighted. This consensus had formed even before the fall of the Berlin Wall in 1989. The oil shocks and debt crises of the 1970s and 1980s had choked off growth in much of Latin America and Asia, and by the late 1980s reformist politicians in many countries were ready to ally themselves with the transnationalists to the north. In exchange for debt relief and direct investment in their countries, the local reformers pledged to sell off state companies and hack away the thicket of tariffs and regulations that protected local industry and labor. To voters in these countries, the promise at times seemed nothing less than freedom—from corrupt authoritarian governments, from treasury-looting populists, from hyperinflation, from inefficient local business monopolies. Foreign companies, so it was often believed (and so it sometimes proved), would bring better services, lower prices, and more jobs.

Yet by the middle of the next decade evidence began to mount that these grand reforms would never deliver all the promised economic benefits. Some prices fell, but others rose. Foreign companies brought higher-quality products, but they manufactured fewer in-country. Hyperinflation was indeed choked off, but so too was growth. Not that we bothered to notice. Sure, Doonesbury made a few of us question what shoes we wore on our feet, and, yes, we did make Kathie Lee cry, but how many of us actually twisted around
Many of our new partners are not democracies, and their long-term goals and ability to live peacefully remain obscure at best.

to check what was printed on the labels of our underwear! Crises came—Mexico in '94, Asia in '97, Russia in '98, Argentina again and again—but our cars grew brainsier, our computers grew brainier, and all this new wealth burdened us with new existential challenges. What would a soaring Nasdaq do to our core values? How badly would we spoil the children?

By the late Clinton years, globalization had come to mean simply that someone else would do the dirty work, somewhere far away. Our own industrial workers, once we emancipated them from the lines! Why, they could wait tables and drive FedEx vans. They could answer the phones in our new charitable foundations and lug around buckets of goat milk on our hobby farms. Our national duty was no longer to produce but to consume. The slightest twitch in Peoria set off klaxons a world away, calling workers by the thousands to their stations. "America's women need a half inch more on their heels! America's men need ten million more inflatable Budweiser chairs!"

Yes, the market would provide. To this mantra, this Muzak of the '90s, we listened and we believed. Right through the end of the Cold War, we never lost the conviction that government was the proper means by which to share our wealth and to protect ourselves. But our faith now began to shift. Speed and efficiency, we came to believe, were the forces that would bring us comfort and riches. And sure enough, these last ten years the goods kept coming, unloaded into our malls at night from truck trailers, delivered at high noon by UPS. Everything the mind could conjure, in Faustian profusion. So why not cut another of those harnesses that government once dared to set on the shoulders of capital? Why not ignore the transnational alchemists eating away at the institutions that for two centuries have provided us our only shelter? Compaq, Chrysler, Xerox, Thailand, Argentina, Japan—there is no security even for giant corporations and powerful states. Yet we still cling to the belief that some sort of secret social compact will always hold for us. That our state, however battered, however corroded, will continue to shield our bodies should our new best friend, the global market, ever turn against us.

When Robert Schuman, the foreign minister and former prime minister of France, first proposed the European Coal and Steel Community in 1950, he was a sixty-four-year-old pious Christian Democrat. Born to a French-speaking family from the Lorraine, Schuman had served in the German army in the First World War, then found himself a French citizen after Germany ceded control of the region in 1919. By 1950, Schuman's goal was to prevent a third war in Western Europe by making such a conflict economically impossible. He proposed placing control over the coalfields and steel furnaces that stretched from the Ruhr to the Lorraine under a multinational institution, so that neither Germany nor France could ever build great numbers of weapons without the other being aware and, presumably, able to stop it. Despite the strong backing of the Truman Administration, it took the French government two years to gain approval for the plan, which grew to include the coal and steel industries of Belgium, Italy, Luxembourg, and the Netherlands. Even amidst the rubble and economic devastation left by the war, opposition to the plan was strong and complex. Communists throughout Western Europe marched in protest. Italian steelmakers, Belgian coal-mining companies, and De Gaulle's French nationalists denounced the plan. The British waffled, then opted to keep their own steel and coal industries independent. All the while, these newly restored democracies engaged in open, thoughtful, albeit sometimes bitter debate about what amounted to a sharing of sovereignty.

And here is America careening toward a similar economic integration with half the world amidst a near absence of debate and without any of the compelling reasons that drove Europeans together a half century ago. There is no recent history of war. There are no occupying armies to ensure fair use of the industrial capacity we "pool" with everybody. Many of our new partners are not democracies, and their internal workings, long-term goals, and
A decade ago, no large U.S. corporation was dependent on China as either a market or a place of production. Today, hundreds are.

Why did we so glibly fail to understand that running our ever more delicate assembly lines across so many fault lines, political and tectonic, might endanger our power and our well-being? I had occasion late last year to put the question to Larry Wortzel, director of The Heritage Foundation's Asian Studies Center. Wortzel was the assistant U.S. Army attaché in Beijing at the time of the Tiananmen protests, then directed the Strategic Studies Institute of the U.S. Army War College. He has very close ties to some of the most anti-Beijing Bush appointees in the departments of State and Defense, as well as in the offices of the Vice President. Wortzel maintained that involvement among the American, Chinese, and Taiwanese economies would not endanger America's security, because no large company would dare rely too much on sales in China. And what of cross-border supply chains, single-sourcing, the Taiwan earthquake? Our economy, he insisted, in no way depends on manufacturing capacity located abroad. When I mentioned that Andrew Grove, the chairman of Intel—the largest manufacturer of semiconductors in the world—believes the integration of manufacturing activities has made war between the United States and China essentially impossible, Wortzel became red in the face. He leaped forward and said, "If Grove is that dependent on that source then he has assured the destruction of his own corporation."

Wortzel's reaction reveals the fundamental incompatibility of the two great political-economic systems that now operate in parallel. One is a global-manufacturing system created by companies such as Intel, which increasingly act independently of national considerations. Beneath that lies an older system, comprising governments whose ways of thinking date back to a time...
WHOEVER PHYSICALLY CONTROLS SEMICONDUCTOR PRODUCTION CAN PARALYZE THOUSANDS OF THE WORLD'S ASSEMBLY LINES WITH THE FLICK OF A SWITCH when economies were still largely national, when imports and exports were of raw materials and finished goods, and when the idea of a large, vital corporation moving its center of gravity abroad was unthinkable.

We have, it seems, outsourced one time too many. Often I have asked manufacturers to explain how they would keep their production lines running if the supply of a key component were suddenly cut off. Almost always they start by mentioning the robustness of their contingency plans: within days they could easily restart production elsewhere. And if an 8.5 quake strikes Hsinchu? Well, that might pose a challenge—a matter of weeks, not days. And if China ever invades Taiwan? Here the reassurances cease: “There are no models for that,” the CEO of one electronics company told me. That, it would seem, is a question for Washington.

But does Washington know how to compose an answer? Would it be allowed to if it did? The CEOs who lobby the White House and Congress may hunt and fish and eat Delmonico steak like the American industrialists of old, yet Washington somehow ignores the fact that these men now represent corporations whose interests are no longer purely “American,” and whose global expansions are driven more by panic than by political naivete.

Our corporations have seemingly reduced the average individual “nation” to little more than a noisy knot of taxes, work rules, and other geographic idiosyncrasies to be unbound and intertwined with those of the neighbors, but sit through a discussion of trade policy at The Brookings Institution these days and you might be tempted to go buy tickets to a Senators game. You would think that America still swapped Xerox copiers for rusty tools and poorly dyed T-shirts, that there was still such a thing as “competition among nations,” and among “national industries,” for “export markets.”

And as we prattle on here, what goes on twelve time zones away? China seems content to allow the great river of commerce to flow over its ledges and slip between its boulders. And why shouldn’t it? As long as Beijing sits quietly and smiles, its palms upturned, the market will reward its patience and good humor with a steady increase in industrial capacity. Taiwan, Japan, Korea, Mexico, all fret about losing core industrial activity to China, and now Beijing puts its lap and winks at the global semiconductor industry. At the end of the day, who “owns” the actual semiconductor plant matters far less than where the plant is located, because whoever physically controls the production of semiconductors can paralyze thousands of the world’s assembly lines with the flick of a switch. Beijing need not even declare a blockade of Taiwan, backed by a threat to use its missiles, in order to cause economic havoc. If it succeeds in luring enough key manufacturing capacity, Beijing will need only to threaten a peaceful closure of its own border, a sit-down strike if you will, organized by the most powerful labor syndicate in the world.

On being presented with this thesis, the experts in Washington revert to a stance learned a generation ago, in the era of thermonuclear gamesmanship. This, they insist, would be the economic equivalent of Mutually Assured Destruction. China could no more venture such a risk than could we. But there is doubt in their voices. And is there not some reason to fear a Falklands-like scenario in the event that China’s own economy turns sour? Might it not one day prove perfectly rational for Beijing to shut down, if only temporarily, the world’s assembly lines? Did Arab oil exporters not sacrifice immediate revenues for long-term power and plunder in 1973? Did Jefferson not attempt to exact
greater respect from Great Britain and France by denying them American cotton, grain, and tobacco through the Embargo Act of 1807? Did Eisenhower not cut off oil supplies to coerce those same two countries out of Suez in 1956? Would a similar act, from Beijing's point of view, be any less valid?

For years Sovietologists have debated whether Lenin once said, "A capitalist would sell rope to his own hangman." Change "rope" to "supply chain," and, whether Lenin made the statement or not, it is still clearly true.

If terrorists ever want to strike at the heart of American manufacturing, they need not sneak into Ohio to do so. More certain success, with more concentrated results, awaits along the industrial boulevards of Taiwan. And what of the Philippine colonel or Indonesian autocrat who one day wakes to find that the electronics industry, in its national wisdom, has placed 80 percent of the world's chip-assembly, or even chip-testing, operations in his country? Must we now abide and buy off cranks such as Malaysia's Mahathir the way we must abide the dos Santoses of the world and the families Saud? As our companies continue to scatter industrial capacity to the far corners of the globe, then to trim slack at home until they come to depend on that distant capacity, are we not witnessing the creation of a new strategic commodity like oil, control of which can be exploited to wrangle away our wealth and security? And once a country expropriates industrial capacity in this way would it not be able to use its influence to prevent the affected industry from ever building competing capacity elsewhere again?

Then there is China. Thirteen years ago, Francis Fukuyama wrote an essay called "The End of History?" Human political thought, he argued, had stumbled at last through the gates of a Hegelian heaven. Political perfection would forevermore be defined as Liberal Democracy supported by a capitalistic economic system. Published during the summer of Tiananmen, when it seemed that all the world's authoritarian regimes were withering away, the article (perhaps unintentionally) set the tone for an American triumphalism that did not crest until well after the Soviet Union collapsed in 1991. Yet atop the seas of champagne that engulfed the world in those days there floated an ark with so little in its hold, and so much blood on its deck, and such ridiculous Khrushchev-era weaponry, that it seemed barely worth another glance. It is clear now that the vessel did not sink, and that in its hull it carried an answer to, if not a refutation of, Fukuyama's argument. The liberal democratic state, its powers continuously eroded by the immense forces of the modern market, simply leaves too much up for grabs. And grab is exactly what a more cohesive political entity than our own may try to do.

The greatest danger of all may not be that Beijing one day dares to coerce the West but that the plan to undermine Beijing actually works, that the massive movement of money, goods, and ideas will lure freedom-seeking citizens back to Tiananmen. Revolutions, as we sometimes forget, can turn violent. How long, if violence strikes China, will we have to wait for our shipments of semiconductors and alternators and gaskets to arrive? Might we not find ourselves obliged one day, by the selfsame economic interdependence that was supposed to undermine Beijing, to prop up that regime in order to ensure the proper functioning of our own economy?

After two decades of deregulation, of voting away our few slight powers in exchange for BMWs and bass boats, we may soon discover, like Lear, that our children do not remain grateful for our generosity forever. We soared out of the 1990s convinced that we could inhabit forever our Cisco-style role as the commanders and controllers of an outsourced world. Now, barring a revolution in how we view business, we may be lucky to eke out a few good years as the corporate front end, the marketing department, for China. Unless, of course, Beijing decides to vertically integrate that activity too.