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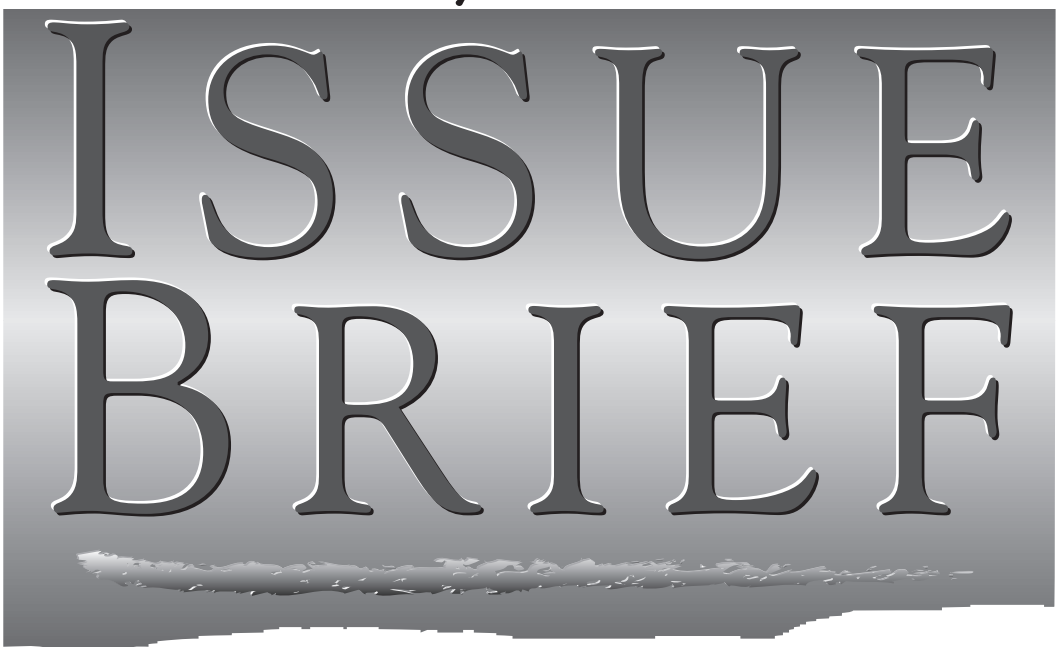
Summary: *Consumer groups and the media are putting pressure on public officials to allow U.S. citizens to reimport drugs from foreign countries like Canada.Using an economic simulation model, this report concludes reimportation or price controls would have a dramatic negative impact on the Illinois economy, and its large biotech sector.*



Drug Reimportation and R&D Spending:

The Economic Impact on the Illinois Economy

By David G. Tuerck, John Barrett, and Douglas Giuffre

Introduction

In December 2003, Illinois Governor Rod R. Blagojevich and U.S. Representative Rahm Emanuel (D-Chicago) submitted a formal request to United States Health and Human Services (HHS) Secretary Tommy Thompson requesting permission to launch the first federally approved drug reimportation pilot program. A report commissioned by the governor and released that October indicated that Illinois and its health plan participants could save a combined $90.7 million a year under the program.[1] Moreover, following the lead of other states, in the summer of 2004 Illinois established a website to help its citizens buy prescription drugs through Canadian pharmacies. Despite their requests being denied by HHS, Illinois and Wisconsin launched the nation's first state-sponsored importation program in early October 2004.

The governor's plan follows steps taken by other public officials faced with rising health care bills and dwindling resources. Public officials in New Hampshire, Boston and Springfield, Massachusetts had previously outlined plans to allow prescription drug imports from Canada without approval from the federal government. The growing support for such policies should be of concern.

A growing body of literature warns of the economic consequences of implementing widespread reimportation polices or price controls.[2] This report adds to that literature. In a September 2004 report, *The Impact of Drug Reimportation and Price Controls: The U.S. and Massachusetts*, the authors argue that a drug reimportation program is both a shortsighted and possibly futile effort to control prescription drug prices.[3] Among the possible scenarios that could develop in response to widespread drug reimportation, the authors consider efforts by foreign countries to restrict supply:

> One can hardly expect Canadian health care administrators to be complacent about growing shortages of drugs in Canada due to reimportation

> by Americans. While the effect on the supply of drugs in Canada may not be noticeable when only a few cities reimport drugs, U.S. prescription drug consumption (53 percent of the world market) is so large that it would have a negative effect on the supply of drugs in Canada (or, for that matter, in any other country).[4]

It seems this possibility is already being realized. Some Canadian officials and pharmacy groups are already looking for ways to curb exports to the United States. Both the Canadian Treatment Action Council (CTAC), an advocacy group for people with HIV, and the Canadian International Pharmacy Association (CIPA) have expressed concern about U.S. reimportation schemes' effect on Canadian drug supplies. The CTAC said it will stop bulk prescription drug sales to U.S. states and municipalities, and a coalition of patients and pharmacy groups asked the Canadian government to ban prescription drug exports.[5] The sentiment was echoed by David MacKay, executive director of CIPA, which represents pharmacies that export 80 percent of the drugs sent to the United States, "We can't be the drugstore for every American; we can probably help the most needy."[6]

Corroborating these points, a recent report by the U.S. Congressional Budget Office (CBO) published in November 2003 estimated that adoption of a nationwide reimportation program would only reduce total prescription drug expenditures by about 1 percent, or $40 billion, from 2004 through 2013.[7] The savings are small because of the additional cost required to adopt counterfeit-resistant packaging of both imported and non-imported drugs. The estimated impact on total expenditures was calculated by taking into account the potential actions of drug manufacturers to regain profits, by restricting supply.[8]

The other likely response discussed in the IPI report was reduced investment in research and development by pharmaceutical companies as their profit margins are squeezed by falling prices. The report estimates that within the first 12 years of a national reimportation or price control program, R&D spending would fall by $14.8 billion [in net present value terms]. We consider this response more fully in the next section.

The Impact of Drug Reimportation and Price Controls on the Illinois Economy

Research and Development in the Illinois Economy

The pharmaceutical industry is a powerful engine for growth in the Illinois economy. According to a February 2004 study by the Milken Institute, the industry accounts [directly and indirectly] for roughly 107,000 jobs statewide and $9 billion in industrial output.[9] In fact, employment in the pharmaceutical industry has grown by 40 percent since 1990, outpacing an overall state employment growth of 10 percent.

The state also fares particularly well in attracting industry research and development dollars. According to the National Science Foundation, the biopharmaceutical industry spent $1.2 billion on research and development in Illinois in 2002; good enough to rank the state 5th in terms of industrial R&D spending per capita.[10]

Unfortunately, the news is not entirely good for Illinois. Despite being home to two large pharmaceutical companies - Abbott Laboratories and Baxter International - evidence suggests that the state's position in the pharmaceutical industry is slipping. Over the past decade, the state's share of national pharmaceutical output has declined from over 7.5 percent (in 1993) to just over 6 percent (in 2002).[11] As the Milken study reports, "Large international firms, like Novartis, have relocated their R&D headquarters to the U.S. Other states, however, have attracted and received most of the international R&D inflow."[12]

The September 2004 study released by the Institute for Policy Innovation (IPI) reports that a price control policy implemented at the federal level could result in a loss of $14.8 billion in industrial R&D spending over the first 12 years. Illinois, home to roughly 7 percent of the nation's industrial R&D spending, would be among the worst hit states in the nation. We estimate the loss in R&D spending to approach $1.06 billion [in net present value terms] within the first 12 years.

Economic Impact on the Illinois Economy

Although there are varied methods of measuring economic impacts, the idea is straightforward. Initial spending in an economy has a "ripple" effect whose influence flows through to other sectors and households in the region. In essence, the initial spending in one sector brings about further spending in other sectors. This process creates new income and employment as it reverberates through the business community. Depending on the size of the initial impact, these ancillary effects can be quite large. For example, Boeing's contribution to the Greater Seattle economy extends far beyond its initial outlay in wages and purchases.

In other words, each expenditure has what economists call a "multiplier" effect that represents the recycling of money and income in an economy. By determining the multiplier for each category of expenditures, it is possible to simulate the initial spending and trace its influence

through an economy. By measuring the change in economic indicators (employment, for instance) we can calculate the ultimate economic impact.

The economic contribution of R&D spending in Illinois consists of three types of impacts: direct, indirect and induced.

- The ***direct impact*** represents the economic impact directly attributable to the biotech firms: local purchases and employee compensation. For instance, in the pharmaceutical or biotech industries this may take the form of spending on legal services to secure patents. This spending creates income and employment directly for the industry's vendors (legal services in this case).
- The ***indirect impact*** represents the spending done by other businesses supplying the goods and services demanded by the industry. For instance, the spending done by a local law firm as a result of their hiring by a biotech firm creates employment and income for the law firms' vendors.
- Finally, the ***induced impact*** refers to the income and employment created as a result of the spending done by the employees of the biotech industry, its intermediate suppliers and their vendors. Restaurants, real estate agents, gasoline stations, etc. all benefit from the local spending done by employees.

Using the IMPLAN model to describe commodity flows through the Illinois economy, we estimate the annual impact on the state economy as a result of the abandoned R&D spending.[13] Table 1 below summarizes the cumulative impact through the first six years of a price control policy.

Table 1 Economic Impact of Reduced R&D Spending in Illinois, 2005-2010

Year	Lost R&D Spending in Illinois (millions, 2000$)	Lost Value-Added (millions, 2000$)	Employment Loss in Scientific R&D Industries	Loss in Employment
2005	22.24	31.13	254	461
2006	46.20	64.64	527	957
2007	70.62	98.81	805	1,463
2008	92.82	129.88	1,058	1,923
2009	112.92	158.01	1,287	2,339
2010	130.88	183.14	1,492	2,711

We measure the economic impact using value-added as a measure of local economic activity; it represents the economic activity that ultimately sticks in the Illinois economy. Included in value-added is employees' wages, proprietors' income, indirect business taxes and corporate profit.

The loss of R&D investment in Illinois has overarching effects on the state's economy. The cumulative loss in

The IMPLAN Model

The IMPLAN economic impact modeling system is a product of Minnesota IMPLAN Group, Inc.

IMPLAN provides regional industry multipliers, which enable the user to provide detailed analyses of the direct, indirect and induced economic impacts on the local economy of a change in final demand for certain industries.

IMPLAN multipliers are designed to model a variety of scenarios and are traditionally used to model a shock to a regional economy. Examples of uses of the model include opening or closing military bases, new energy facilities, new sports stadiums, opening or closing manufacturing plants and airport or port facilities. All these scenarios are modeled by estimating changes in final demand by industry and entering them into the IMPLAN model for the region.

Any systematic analysis of economic impacts must account for the inter-industry relationships within a region. IMPLAN, accounts for inter-industry relationships through the use of a regional transaction table that is algebraically manipulated to produce a set of regional multipliers.

IMPLAN captures the direct effects of changes in final demand and local purchases made by local companies as a result of this increase in final demand. Because IMPLAN is based on regional industry multipliers it will also capture the ancillary effects arising from the income earned from the local companies' input purchases.

IMPLAN is based on a national transaction table that is regionally adjusted through the use of Regional Purchase Coefficients (RPC). RPC's represent the portion of local demand purchased from local producers. Once the transaction table is regionalized, a coefficient matrix is derived by dividing each industry column by the column total. This coefficient matrix is also called the A matrix. Through the algebraic manipulation performed below the regional multipliers are derived:

$$X = (I - A)^{-1} Y,$$

where:

X = Industry output,
I = Identity matrix,
A = A matrix,
Y = Final Demand.

This analysis accounts for changes in Y, in the form of R&D spending. For the purposes of this study, the IMPLAN model is used to determine how the loss in R&D spending translates into value added and employment losses throughout the economy.

employment for the period 2005-2010 is 2,711 jobs, many of these (1,492) in high-paying research positions. The lost R&D spending further results in a cumulative loss of $183 million in regional value-added.

These estimates, although fairly large, are likely to be conservative. The IPI report upon which these estimates are based focused solely on the impact of price controls on reinvested capital. The analysis does not consider the implications for venture capital investments in biotech projects, an important resource for biotech companies in the past. In fact, an average of $2.7 billion in venture capital was invested in life sciences firms annually from 2001-2003.[14] While it is difficult to estimate the impact of price controls on venture capital investments, the growth rate in biotech venture capital investments contracted by 6 percent and 16 percent in 1994 and 1995, when the Clinton administration threatened to control prices.[15] A similar drop would be a terrible blow to the industry today. Thus, while an estimate of 2,700 jobs lost and over $1 billion in lost investments may appear large, this may simply be the tip of the iceberg in terms of economic losses.

Conclusions

The pharmaceutical industry remains an important contributor to Illinois' economy. As a home to some of the nation's leading pharmaceutical firms, the state benefits from over a billion dollars of industrial R&D investment annually. In the process, thousands of high-paying jobs have been created and new, innovative drugs are being developed. Price control or reimportation policies, designed to constrain prescription drug prices will, in the process, damper the incentive for the industry to engage in expensive and risky drug development. The result will be fewer new drug developments and fewer high-paying jobs in research-intensive states, like Illinois.

Endnotes

1. Office of the Governor, Press Release, December 22, 2003. Referenced at http://www.illinois.gov/PressReleases/ShowPressRelease.cfm?SubjectID=32&RecNum=2549.
2. See for instance, John A. Vernon, "Examining the link between price regulation, reimportation and pharmaceutical R&D investment," *Health Economics*, 2004.
3. The Institute for Policy Innovation, *The Impact of Drug Reimportation and Price Controls: The U.S. and Massachusetts,* September 2004.
4. Ibid., page 3.
5. Jeffrey Sparhott, "Drug dearth a fear in Canada," *The Washington Times*, October 20, 2004.
6. *Ibid.*
7. U.S. Congress, Congressional Budget Office, "Would Prescription Drug Importation Reduce U.S. Drug Spending?" *Economic and Budget Issue Brief*, April 2004. Referenced at http://www.cbo.gov.
8. However, the CBO report neither discusses its calculation methodology in great detail, nor does it explain why the anti-counterfeit technology would be applied to both imported and non-imported drugs under this act.
9. Ross DeVol, Rob Koepp, Kevin Klowden and Armen Bedroussian, "The Illinois Pharmaceutical Industry: Survey of Economic Impact and Importance," *Milken Institute*, February 2004(a).
10. Ross DeVol, Perry Wong, Armen Bedroussian, Lorna Wallace, Junghoon Ki, Daniela Murphy and Rob Koeppin, "Biopharmaceutical Industry Contributions to State and U.S. Economies," *Milken Institute,* October 2004(b).
11. Milken, 2004(a).
12. Milken, 2004(a), page 4.
13. For a discussion of IMPLAN, see sidebar.
14. Milken, 2004(b), page 125.
15. David M. McIntosh, "Drug Importation: A Prescription to Put Biotech on Life Support," *Washington Legal Foundation*, Legal Backgrounder, Vol. 19, No. 15, June 11, 2004.

About the Institute for Policy Innovation

The Institute for Policy Innovation (IPI) is a non-profit, non-partisan educational organization founded in 1987. IPI's purposes are to conduct research, aid development, and widely promote innovative and non-partisan solutions to today's public policy problems. IPI is a public foundation, and is supported wholly by contributions from individuals, businesses, and other non-profit foundations. IPI neither solicits nor accepts contributions from any government agency.

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