

Executive Summary

Comprehensive Examination of the Performance of the Indiana 21st Century Research and Technology Funds

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Executive Summary

Indiana's long term prosperity depends greatly upon the fruitful realization of technological innovation into the markets for production of goods and services. Through three administrations—O'Bannon, Kernan and Daniels—the state has supported technology transfer and commercialization through the careful administration of the 21st Century Research & Technology Fund.

This study reviews this Fund, examining its background, appropriate metrics for evaluating the ongoing efficacy of the Fund's investments and its broad characteristics and ongoing adjustments to investment strategies. We outline the connections between the fund and the recipient industries in Indiana, the connections between the Fund and public policy and the aggregate short term effects of this Fund. We follow this analysis with recommendations for Fund management and policymakers. We note at the outset that this study does not report the long-term Return on Investment (ROI) of this Fund. That is not because it is unimportant, but rather because the Fund is not yet sufficiently mature to make such a calculation. This executive summary reviews the major findings of our study.

During the first decade since the 21st Century Fund's inception over \$238 million in funds have been invested in 188 different projects, designed to leverage private sector venture capital, harness the potential of science and technology developed within Indiana, nurture the institutions of technology transfer and harness the power of scientific creativity to better the lives of Hoosiers. Drawing from a broad vision of the General Assembly's legislation beginning in 1999, the Fund has focused investment in those industries targeted broadly by the State of Indiana: advanced manufacturing/engineering, information technology/software development, and life sciences/healthcare. A narrow funding focus is identified as a 'best practice' for state venture capital funds and the concentration of the 21st Century Fund in these sectors is consistent with recommended practices.

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Figure 1: Industry Share of 21st Century Fund Awards

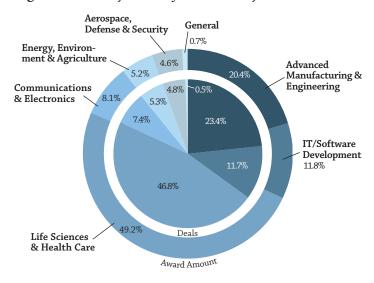
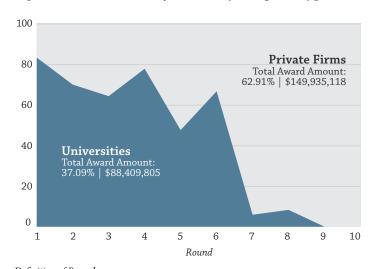
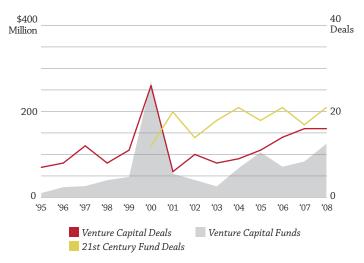


Figure 2: *Percent Share of Awards by Recipient Type*



Definition of Rounds												
R	Year	R	Year	R	Year	R	Year	R	Year			
1	1999-00	3	2001-02	5	2003-04	7	2005-07	9	2008-09			
2	2000-01	4	2002-03	6	2004-05	8	2007-08	10	2009-10			

Figure 3: 21st Century Fund Effect on Venture Capital



Source: State Science and Technology Institute - http://www.ssti.org/vc/indiana/all.php

Primary Source: PricewaterhouseCoopers/National Venture Capital Association Money Tree Report

Data: Thomson Financial

The selection of targeted firms within this industry has been guided by evolving best practices in state venture capital funding efforts. Refined over six funding rounds, Indiana's 21st Century Fund uses a two stage scientific peer review process with an acceptance rate equivalent to the most prestigious scientific journals. In addition, careful scoring of the business essentials prior to Fund investment focuses on assessing the path to effective commercialization of 21st Century Fund investments. The reliance on peer review and entrepreneurial capacity both in the pre- and post- investment period are identified as best practices within state venture capital funds. We find Indiana's 21st Century Fund to be a market leader in these aspects of state venture capital efforts. An example of the evolving focus on recommended investment strategies has been the Fund's shifting concentration on investment from basic science and technology towards efforts that are more developed and hence closer to commercialization.

This shifting prioritization of the Fund's efforts holds many potential benefits for the Fund. First, this should accelerate the Fund ROI by targeting investments that are closer to actual revenue repayments. Second, this shifting effort directly enhances the commercialization ties between the knowledge generation process at universities and private enterprise. Third, the focus on more commercial opportunities serves as an informational filter for private sector venture capital firms. This reduces the cost of assessing the viability of a potential investment and thus makes Hoosier firms more attractive. Finally, this focus side-steps the concern that state venture capital funds might fall trap to SBIR mills that lack the capacity for eventual commercialization. The shift of the Fund's focus was evident in the 2003-2005 timeframe. The most visible evidence that these best practice efforts resulted in a policy adjustment appear in the shifting share of awards from universities to private firms.

Full evaluation of these potential benefits remains a task for a much later study, following more elapsed time. However, at this time some emerging evidence of these benefits has occurred. In particular, the leveraging of private sector venture capital funds and federal funding appears to be linked to the 21st Century Fund. The most obvious of these is growth in Indiana's private venture capital funding, which has blossomed in the most recent years.

Federal R&D funding focus has also shifted towards later stage commercialization through the SBIR/STTR grant streams. Indiana's 21st Century Fund's alignment of this focus has resulted in a leveraging of roughly four out of five Federal commercialization dollars.

The 21st Century Research and Technology Fund is not intended to perform as a traditional economic development tool. Its size relative to the state's economy and the focus on commercialization of R&D make it unable, in the short to medium term, to affect the industrial mix of employment, incomes or establishments. However, we have estimated the Fund's impact on short term job creation in Indiana.

Table 1: Economic Effects of The 21st Century Fund

Round	1	2	3	4	5	6	7	Total 1999-2007
Change in Private Non-Farm Employment	463	1,716	1,348	1,582	2,648	1,729	1,646	11,132
Cost per private sector job	30,233	13,559	10,924	15,720	12,202	12,966	15,766	14,152
Real state GDP (\$millions)	12	65	54	58	105	70	63	427
Real Disposable Personal Income (\$million)	8	43	38	43	77	54	52	315
Population	15	194	314	412	643	718	762	3,058

To estimate these impacts, we evaluated the first seven funding rounds, from 1999-2000 through 2005-07. We limit the analysis to this time frame because more recent years of funding are too recent to fully account for the economic adjustments and therefore cannot be assessed with the model. We focus on key economic variables: total and private sector employment, state Gross Domestic Product, incomes and population changes. This was approached differently than most reported economic development impacts. Here we not only estimated the employment effect of the Fund and leveraged private sector funding (\$360 million), we also subtracted both the opportunity cost of the Fund (in terms of lower state spending on other activities) and administrative costs. We did not include the additional value of leveraged Federal R&D spending (\$26 million) in this estimate. These assumptions result in a conservative estimate of the Fund's short term impact on Indiana's economy.

We estimate the impacts using the well known REMI, Inc. regional economic model. Our simulation finds that over the first seven rounds, the 21st Century Funds have boosted private sector employment by roughly 11,132 jobs, more than what would have been otherwise. It is important to note that some of this total job creation has been offset by lower state employment during this period, a necessary opportunity cost of the Funds operations. The cost per private sector job is roughly \$14,000 per job year in initial funding. Though the Fund was not designed to boost short- to medium-term job creation, this cost is only slightly higher than the most effective job creation incentives found in the economic literature. Total state GDP was boosted by \$427 million over this period with real disposable personal income growing by \$315 million. Our simulation results also account for population changes resulting from this level of state expenditure and leveraged private venture capital. The model suggests this boosted state population by a little more than 3,000 persons over this period. Compared to direct economic development incentives, this program ranks as moderately effective, a strong achievement given that is not its goal.

The results of this simulation hearken back to much of the formal research on state venture capital funds. The broadest conclusion mentioned above is that while states can effectively operate such funds, they are not likely to make broad contributions to shortterm economic development efforts due to their size and scope.

Summary & **Broad Recommendations**

Our review of Indiana's 21st Century Research and Technology Fund provides the broadest study of a single fund currently available. Drawing from studies of other state venture capital funds and the academic research on the performance of such funds, we come to several conclusions. First, the Fund appears to be operating on best practices with respect to its narrow industry focus and both scientific and business plan peer review. These practices offer considerable benefit in terms of improving commercialization infrastructure in Indiana. The adjustment of the Fund towards more probable commercialization activities between 2003 and 2005 also represents a significant adjustment in line with the best practices in the field for this time period. Best practice models in today's entrepreneurial ecosystem involve venture development organizations leveraging regional resources, angel outreach programs, centers of excellence, local sources of capital and talent. The 21st Century Fund appears to adjust quickly to adjustments to best practices.

Academic research on state venture capital funds finds that a very long horizon is needed to fully evaluate the ROI of funding efforts. Thus, we are unable to speak definitively to the long term performance of the Fund in its commercialization efforts. However, employing conservative assumptions we find the Fund has contributed over 11,000 jobs and \$427 million in economic activity to the state.

We make several specific minor recommendations regarding expansion and evaluation of the review process, appropriate performance metrics, design and dissemination of data, the marketing and promotion of the Fund, ongoing connections to economic development and public policy efforts and future research timing and questions.



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