

CAN WE KNOW WHAT WE WANT TO KNOW?

NATIONAL HEALTH PROBLEMS AND USEFUL KNOWLEDGE: LESSONS FROM
PUBLIC FUNDING OF DIABETES RESEARCH IN MEXICO
NATERA, ROJAS-RAJS, DUTRÉNIT AND VERA-CRUZ (2019)

JOSÉ MIGUEL NATERA

CONACYT / UNIVERSIDAD AUTÓNOMA METROPOLITANA - XOCHIMILCO

JOSEMIGUELNATERA@GMAIL.COM

JULIO 2019

KNOWLEDGE PRODUCTION AND APPLICATION

- A long tradition: knowledge production processes and their impact on knowledge application
 - (Pure and oriented) basic research, applied research, technological development (OECD, 2015)
 - Curiosity-driven & problem-oriented research (Nowotny, Scott, & Gibbons, 2001)
- There is no good or bad, nor better or worse...

THE THING IS...

When we need to solve a problem:

How effective is the Science and Technology policy in orienting the knowledge production process?

Can we know what we want to know?

AGENDA

- A general context of the Mexican STI Policies
 - Mechanisms and incentives
- The case: public funding for research on diabetes in Mexico
- Bohr's research type
- Some ideas on how to deal with it

THE MEXICAN STI POLICIES

CONACYT has had three main programs to fund scientific research:

1. Basic Science fund (with the Public Education Ministry).
2. Sectoral funds (with the related ministries):
 - Health
 - Water
 - Agriculture
3. Problem-oriented scientific development fund
 - Emerging diseases of national importance

THE MEXICAN STI POLICIES

- The main CONACYT funding scheme is **Competitive Funds**
 - **Peer review** processes: delegation of resources allocation in the hands of the scientific community
 - **Basic science** funding act as an umbrella: research projects that combine different levels of applicability and search of fundamental knowledge can be found

THE MEXICAN STI POLICIES

National System of Researchers (SNI)

- The SNI is CONACYT's national quality certification, **well appreciated** in career promotions and projects' evaluation.
- SNI's main products: **scientific publications** (papers in indexed journal, books, and book chapters) and **human resource training** (postgraduate thesis directions).
- It includes a pecuniary incentive for researchers, might account for **up to 40%** of researchers' monthly income.

PUBLIC FUNDING FOR DIABETES RESEARCH

- We analysed knowledge production forms and the types of research undertaken for diabetes in Mexico & discuss the reasons behind the existing research profile
 - Diabetes Mellitus a serious health problem in Mexico calling for immediate solutions
 - Mexico has been augmenting its health scientific capabilities over time

PUBLIC FUNDING FOR DIABETES RESEARCH

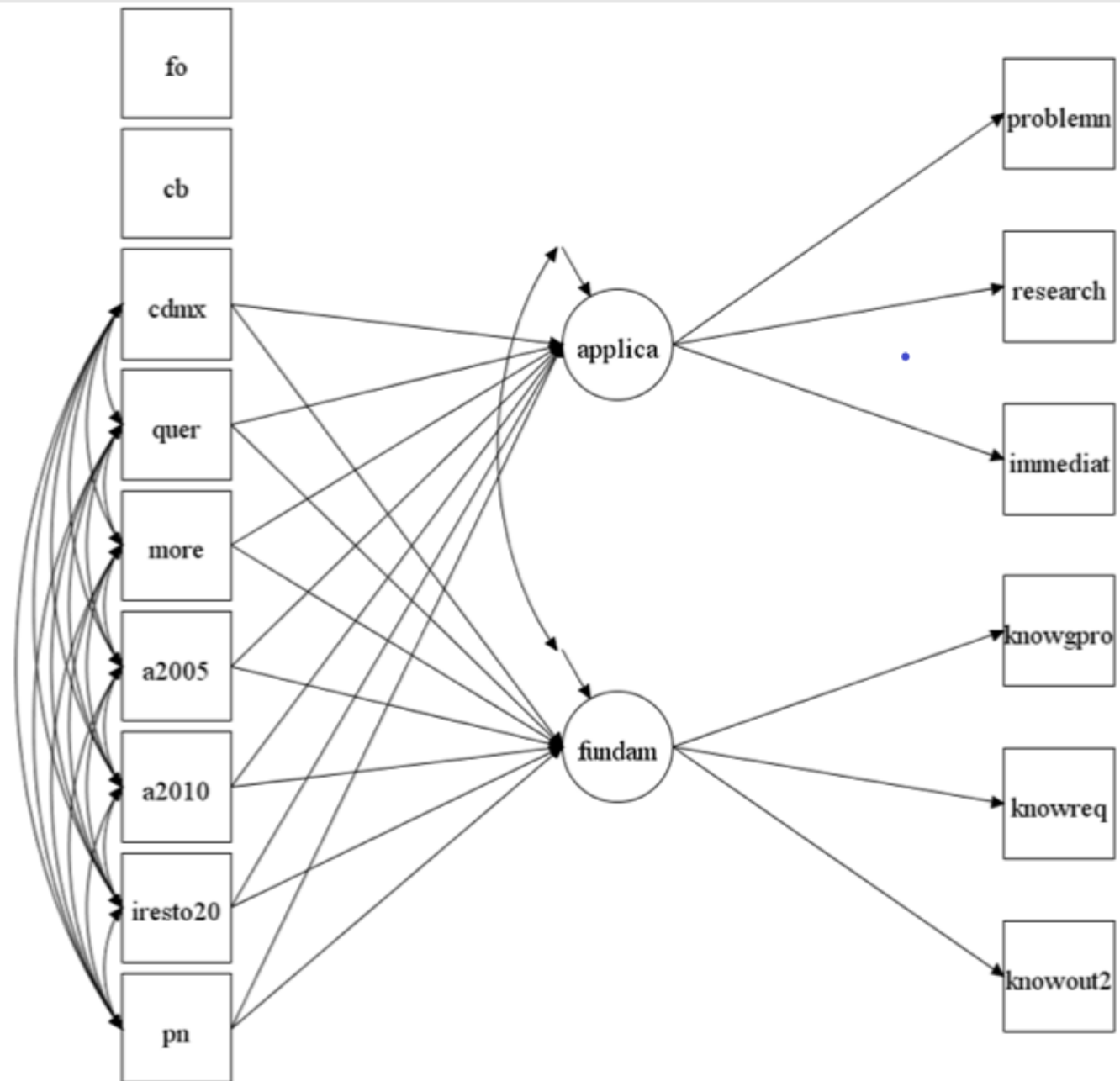
- We have constructed an extensive dataset of diabetes research projects funded by CONACYT during the period 2002 – 2014 (303 projects) approved in CF mechanisms in three funds:
 - Basic Science fund
 - Sectoral Health fund
 - Problem-oriented fund
- We wanted to construct a framework to evaluate CONACYT funding mechanisms using a relevant problem

PUBLIC FUNDING FOR DIABETES RESEARCH

		Nature of the problem (input dimension) Nature of the research (process dimension) Perspective of immediate use (output dimension) Consideration about the use?	
		No	Yes
Knowledge requisites (input dimension) Knowledge generation process (process dimension) Knowledge progress (output dimension) Search for fundamental understanding?	Yes	Pure basic research (Bohr)	Use-inspired basic research (Pasteur)
	No		Pure applied research (Edison)

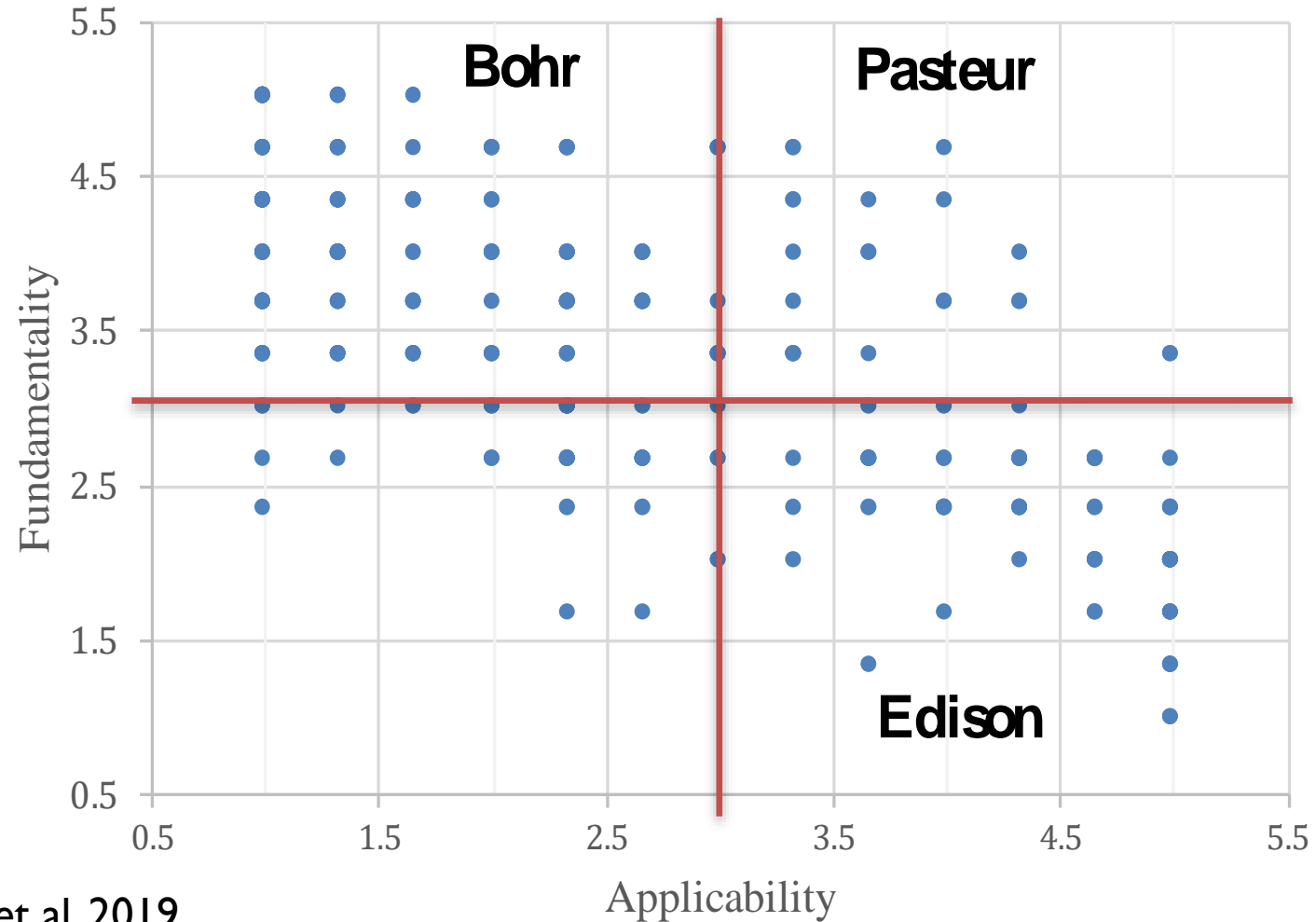
Source: Natera et al. 2019 (based on Pasteur 1997 and de Sousa, Zamudio Igami and de Souza Bido 2009)

SEM APPROACH MEASUREMENT MODEL OF PASTEUR QUADRANT FOR DIABETES RESEARCH IN MEXICO



Source: Natera et al. 2019

PUBLIC FUNDING FOR DIABETES RESEARCH



Source: Natera et al. 2019

PUBLIC FUNDING FOR DIABETES RESEARCH

	Basic Science		Health Sectoral fund		Problem-oriented fund		All Funds	
	Millions USD PPP (2011)	%	Millions USD PPP (2011)	%	Millions USD PPP (2011)	%	Millions USD PPP (2011)	%
Bohr	19.30	88.3%	15.90	45.8%	1.45	32.9%	36.65	60.1%
Pasteur	0.76	3.5%	3.63	10.4%	0.96	21.7%	5.34	8.8%
Edison	0.75	3.5%	12.99	37.4%	1.58	36.0%	15.32	25.1%
NoName	1.05	4.8%	2.22	6.4%	0.42	9.5%	3.69	6.1%
Total	21.90	100%	34.70	100%	4.40	100%	61.00	100%

Source: Natera et al. 2019

WHY?

WHY DOW WE FIND THIS SCENARIO?

- **WE HAVE AN URGENT PROBLEM CALLING FOR RESEARCH**
- **WE HAVE FUNDS SPECIFICALLY CREATED TO TACKLE THIS PROBLEM**
- **SCIENTIFIC AND TECHNOLOGICAL CAPABILITIES HAVE INCREASED OVER TIME**

WHY? WHY? WHY?

WHY DO WE HAVE A BOHR'S RESEARCH PROFILE IN MEXICO?

Principal-agent theory, incentives and STI policy

- Delegation: two actors are involved in an exchange of resources (Braun and Guston, 2003)
 - The **principal** owns a number of resources but not those to materialize his interests (Coleman, 1990) (e.g. STI agency)
 - The **agent** accepts these resources in exchange of performing something on behalf of the principal (e.g. researchers)
- Delegation involves problems: **moral hazard** and **adverse selection... and non-verifiability** (Laffont and Martimort, 2002).

WHY DO WE HAVE A BOHR'S RESEARCH PROFILE IN MEXICO?

Lack of policy coherence

- Stimulus schemes incentivize researchers to produce papers, there is no alternative to the SNI
 - Adverse selection: researchers tend to evaluate projects using basic science schemes
 - Moral hazard: opportunistic behaviour, presenting basic research as applied research
- Incentives or funding programs for other knowledge intensive activities are uncertain or unstable (i.e. capital funding for Mexican biotech firms)

WHY DO WE HAVE A BOHR'S RESEARCH PROFILE IN MEXICO?

We do not have the right tools: we cannot verify

- Projects approval is made using generic tools: there is no consideration of applications' specificities
- Projects monitoring is only administrative based: reports are insufficient, CONACYT mainly check for invoices and money spending
- There is no final feedback on projects closing reports: results are not discussed in a systematic way or included in a global repository for further use

SOME IDEAS ON HOW TO DEAL WITH IT

- **Incentives to reorient research system** towards considering knowledge use
 - **Increase resources** for Sectoral funds and the Problem-oriented funds
 - **Creating alternative** systems to the SNI
- Modify the **project approval process into a more democratic process**: the scientific community should dialogue and find consensus with other social actors, in order to agree on projects' social relevance.

SOME IDEAS ON HOW TO DEAL WITH IT

- **Creating specific tools** for projects' different stages:
 - **Approval:** framing Project's proposals to explicitly show applicability and its specificities
 - **Development:** creating participatory mechanisms to determine projects' alignment with knowledge application
 - **Closing:** systematizing products and discussing application possibilities

NOT AN EASY TASK

We need an specific **combination of resources and institutional capabilities** that are not familiar to the Mexican system

We need to open the doors of the Ivory Tower

Does someone knows where are the keys?

CAN WE KNOW WHAT WE WANT TO KNOW?

NATIONAL HEALTH PROBLEMS AND USEFUL KNOWLEDGE: LESSONS FROM PUBLIC FUNDING OF DIABETES RESEARCH IN MEXICO
NATERA, ROJAS-RAJS, DUTRÉNIT AND VERA-CRUZ (2019)

JOSÉ MIGUEL NATERA

CONACYT / UNIVERSIDAD AUTÓNOMA METROPOLITANA - XOCHIMILCO

JOSEMIGUELNATERA@GMAIL.COM

JULIO 2019