#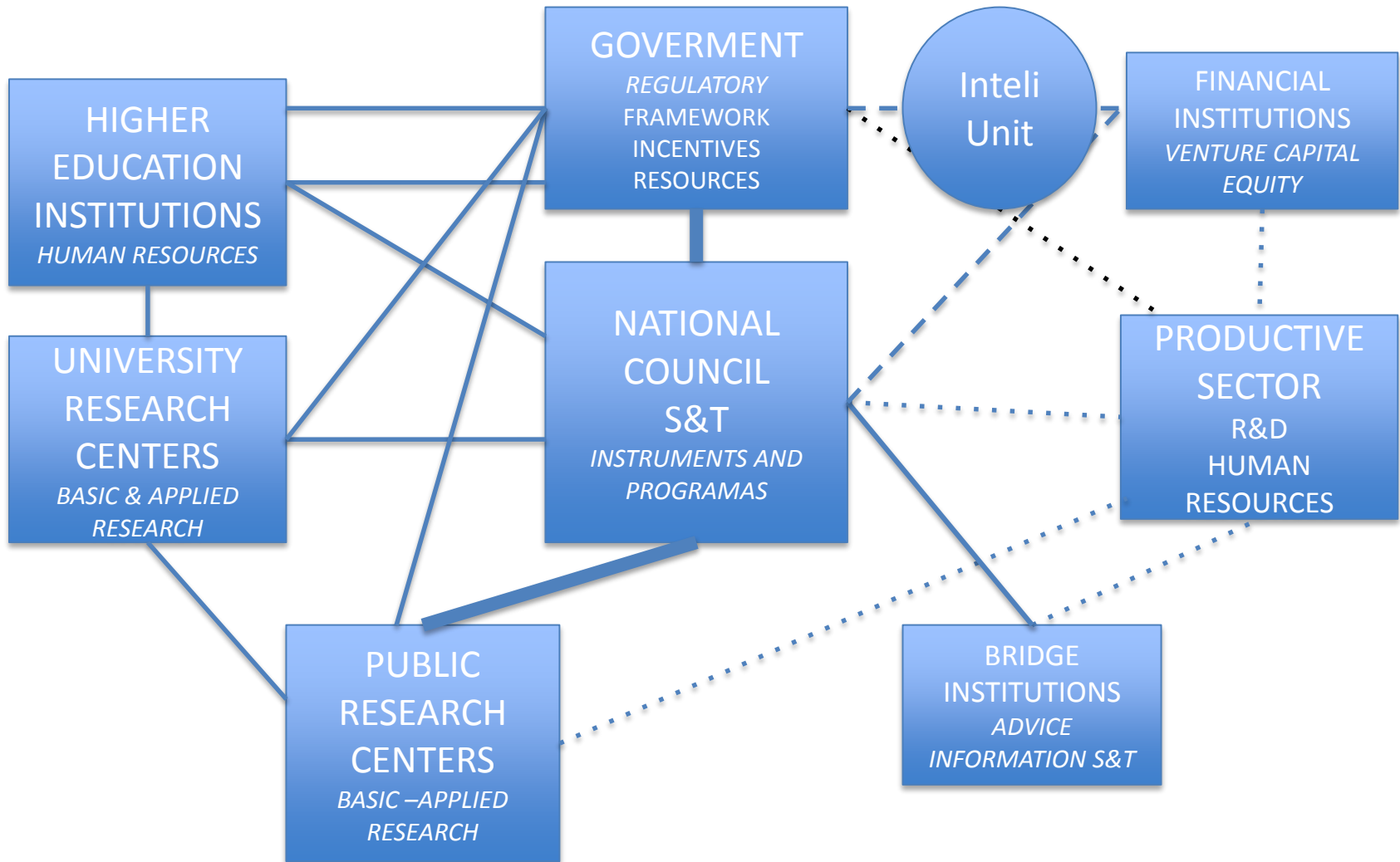 The experience of the City of Beijing on Science, Technology and Innovation (ST&I) and the possibility for such a process to occur in Mexico City

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MEXICAN INNOVATION ECOSYSTEM

THE PRODUCTIVE SECTOR

The main problem with the companies in Mexico   is that they do not use the knowledge produced in the national ecosystem of innovation.

Traditionally, Mexican society lacks a culture of innovation and is unwilling to take risks. These traits are barriers for the interaction between the companies and other actors of the ecosystem. Companies prefer to acquire foreign technology rather than to develop their own.

Nonetheless, slowly this   sector   has increased its ratio in the total spending in R&D in Mexico -from 14.3% in1993 to 41.5% in 2005-.

Venture capital

This represents one of the main weaknesses in the Mexico city system and surely this has hampered (d) the growth of the innovation ability of the companies.

- the institutions that fund venture capital in Mexico are few (Perhaps 28, and among those only 4 could be consider serious players) and the amount available to fund innovation activities is very small to expect a real impact.

Intermediary institutions

- In Mexico there are two kinds of institutions:
- a) Institutions providing financial incentives.

- B) Institutions offering advice and scientific and technological information. They are in charge of bridge-building and match-making, helping to understand the technical side and the business side. Among the few institutions that perform these functions are: infotec, NORMEX, CENAM, IMNC, FUNDATEC, WSCF ADIAT the PtCCF, commissions c & t Congressional and renacecyt.

The government

provides a regulatory framework, incentives and resources

- The regulatory framework is entangled. There are many laws and policies than converge in Education, FDI (Foreign direct investment) , Intellectual property, labor, taxes, etc. But they are not harmoniously connected.
- the national spending in R&D is   very low. It was 0.13%of the GDP in the seventies
- 0.40% in the eighties
- 0.46% after 2008.
- This amount is very low if we consider that the OCDE average was 2.5%.
- The government ratio of participation in the total resources for R&D has decreased (going from 73.4% of the total in 1993 to 49.2% after 2008) but it is still the mayor financing agent.

The public research centers (basic and applied research and education of human resources).

- There are 27 centers that have made a significant effort to reduce their dependence on public funds. They are marketing their products and services to meet the demands of public and private institutions. They also have graduate programs.

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The universities research institutes (basic an applied research and educate human resources)

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- The R& D is concentrated in four institutions and they concentrated 56.5% of the financing founds and 52% of the investment in research and development.
- The aging of the researchers and the lack of capacity of the system to replace them with younger people is an urging problem.
- Another problem is the productivity of the system: few researchers are publishing in international journals. The average impact went from 1.96 to 2.88 in 15 years and only 15 institutions, of 85, concentrate 70% of the production reported in ISI.
- We do not patent.

The institutions of higher education (educate human resources). There has been a great effort to create human resources but we don't have a critical mass.

- The fellowship program to study abroad from conacyt has been in place for more than 37 years. However, it has never been linked to a strategic plan to develop specific technological capabilities in the country and subsequently to employ that human resources.

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- As a consequence, the government faces a huge problem of intellectual resource emigration (brain drain). The diaspora may be a great asset since many Mexican scientist hope to come back home one day.

- The number of researchers employed in the industry increased from 10.3% in 1995 to 45.3% in 2005, while the government reduced its participation from 31% to 15.6%. *This redistribution is considered one of the more important structural changes in the ecosystem.*

- However 1.07 researchers for 1000 workers is a very low proportion (we don't have a critical mass, even Argentina and Chile have two/1000) and the country performance in R&D and innovation is poor.

And

- And all these problems are compounded by for the cultural patterns, market structure and technological infrastructure.

Evaluation

- The 2006 evaluation of the National Ecosystem of innovation found a small number of organizations –public and private- not articulated and lacking of domestic agents to serve as facilitators of the process of innovation and with low financing (.36 of the GDP) mostly coming form the government.

- Six years later, the 2012 evaluation found some improvement:

- New agents -especially intermediate institutions-,

- increasing participation of private founding in research.

- Nonetheless, the capacity to produce knowledge was still limited and the domestic firms presented low demand of science and technology products.

- **Since the performance of the system is measured by number of publications and number of citations, the main objective of the program which is to solve social problems is not being addressed.**

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So what could Mexico learn from China's experiences in building science and technology capacitates?

- we have to make decisions **about what we want to develop** and take actions about it without destroying the natural system. Establishing a strong policy framework that supports the market and local content requirementsDevelop a quota system to keep the market, set targets

- Cultivating plenty of research directly or indirectly related to the companies needs.
- Promoting coordination between programs (the market)
- Key fields
- Priority themes
- Major projects
- Companies and universities
- Systematic and strategic from the view of national development
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非常感谢

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- The most important is to improve the market system and cultivate a favorable Innovation environment other tan tax incentives.

- A more open and coordinating policy system

- Relationship between the government and the market. You are not a coach

- The way you apply the policies, the decisions you make.