

# Panel Discussion: European QIPC Research in the International Context

## QUROPE

Cluster Review Conference, FET QIPC Proactive Initiative, Paris, March 5, 2008

Daniel Loss (moderator)  
University of Basel

External Panel Members: Dana Berkeland, USA  
Charles Marcus, Harvard University  
Seigo Tarucha, University of Tokyo

# Topics of Panel Discussion

## ('wish list' of FET Administration)

- scientific focus of the regional programmes on QIPC. Is it different from the situation in Europe?
- What is the estimated mix of funding for more foundationally oriented research compared to more technologically oriented activities?
- What are the funding instruments in the regions? Support of single teams or consortia including several teams? Typical duration of the projects? Is a monitoring mechanism in place?
- Are the programmes open to collaboration with foreigners?
- What is desirable in terms of international collaboration from the other regions (US, Japan etc.) and from the European side?
- conclusions to be drawn for the shaping of the European activities

# Funding of QIPC outside Europe

**QUROPE**

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# Method of the Survey

1. Web Search (Google Search)
2. Targeted Questionnaire

**The Results from 1 and 2 are consistent.**

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**Caveat: error bars unknown !**

# Sample Size

## Web Search

**205** Research Groups

**75** Research Groups in the U.S.

**1830** People involved

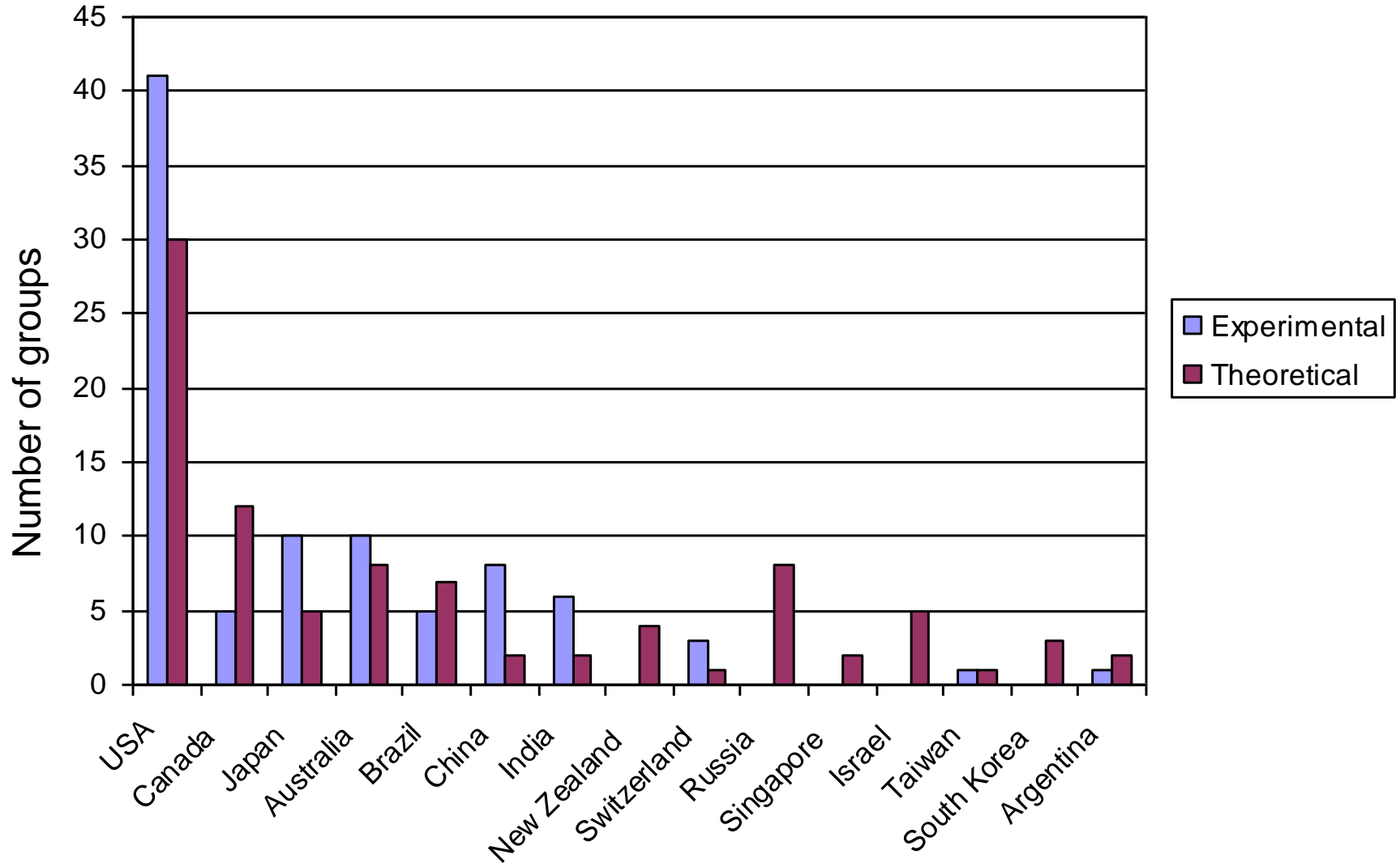
290 Full Profs, 98 Assistant Profs

## Targeted Questionnaire (205 asked)

**71** Research Groups responded

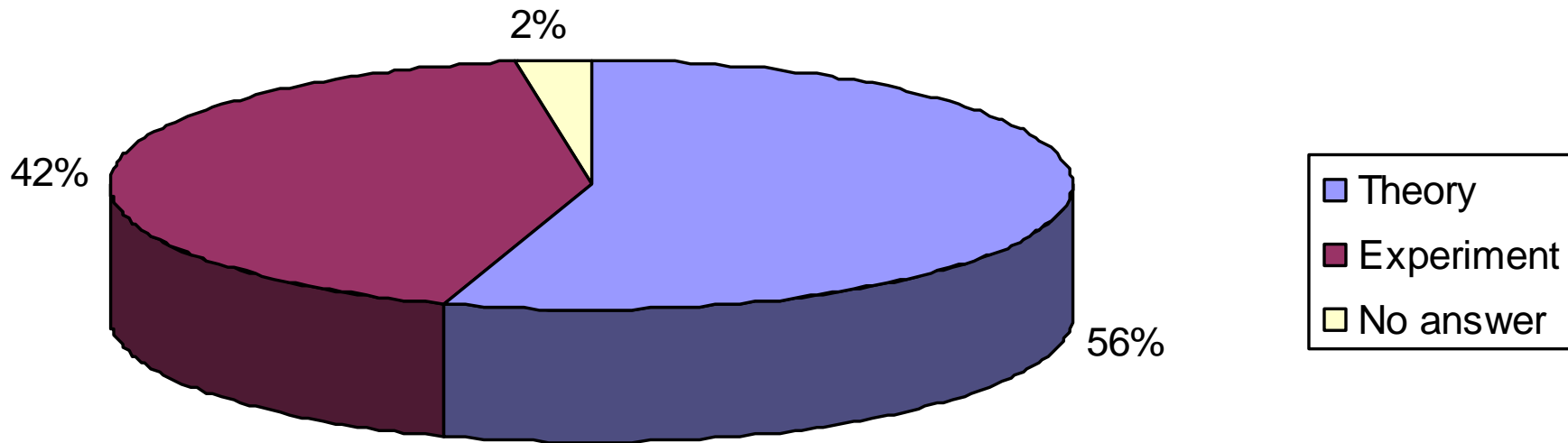
**20** Research Groups in the U.S. responded

# Groups investigated (Total: 205)

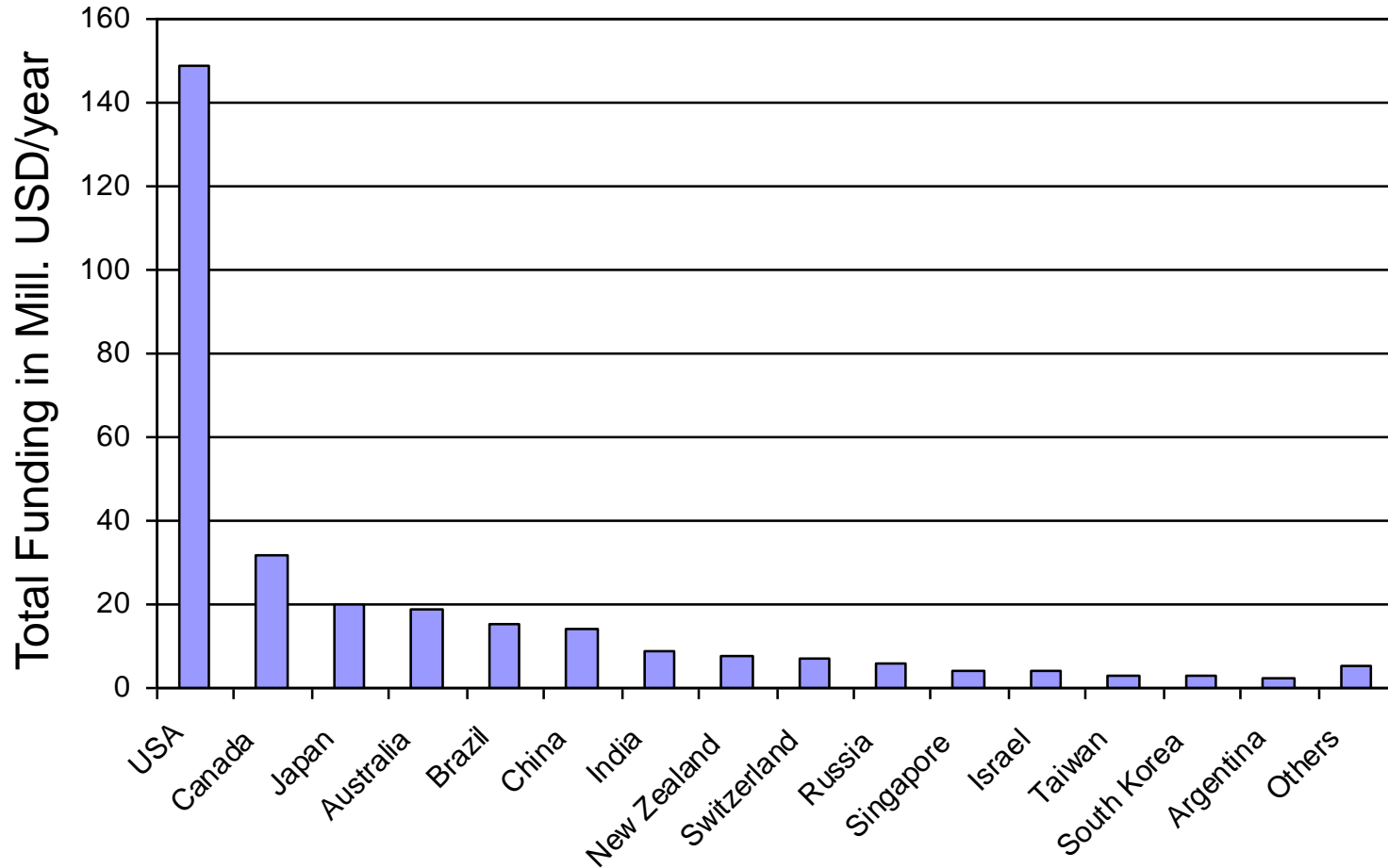


# Theory vs. Experiment

(from Web Search)



# Total Funding in Mill. USD / year (Estimate !)



# Funding Sources USA & Japan

## **Public Funding:**

**USA:** NSF, ARDA (Homeland Security), NSA, Army Research Office, Office of Naval Research, Defense Advanced Research Projects Agency (DARPA), MARCO IFC, ...

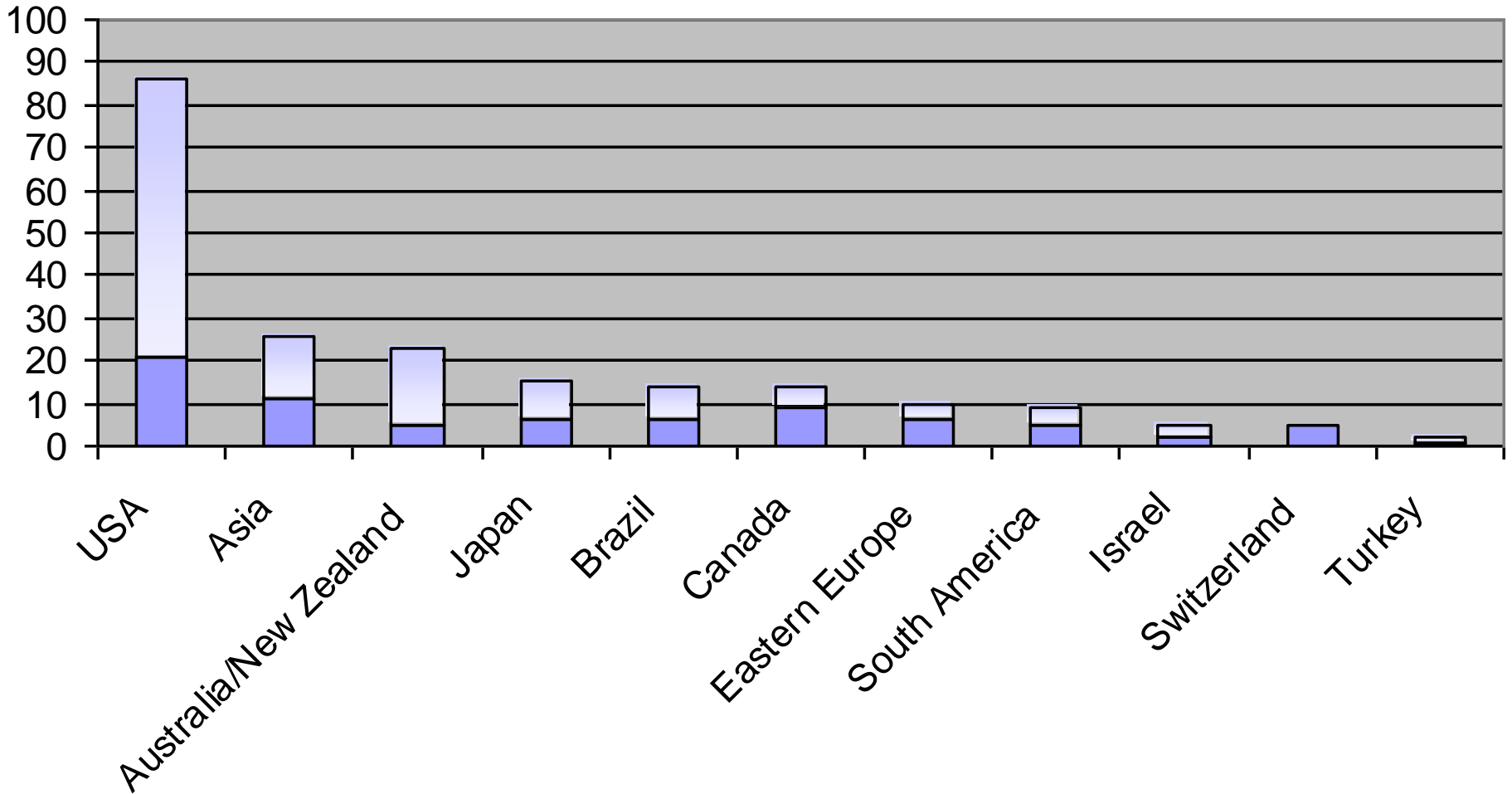
**Japan:** JST, MEXT, NEDO

**Private Funding:** Microsoft, Motorola, Hewlett Packard, ...

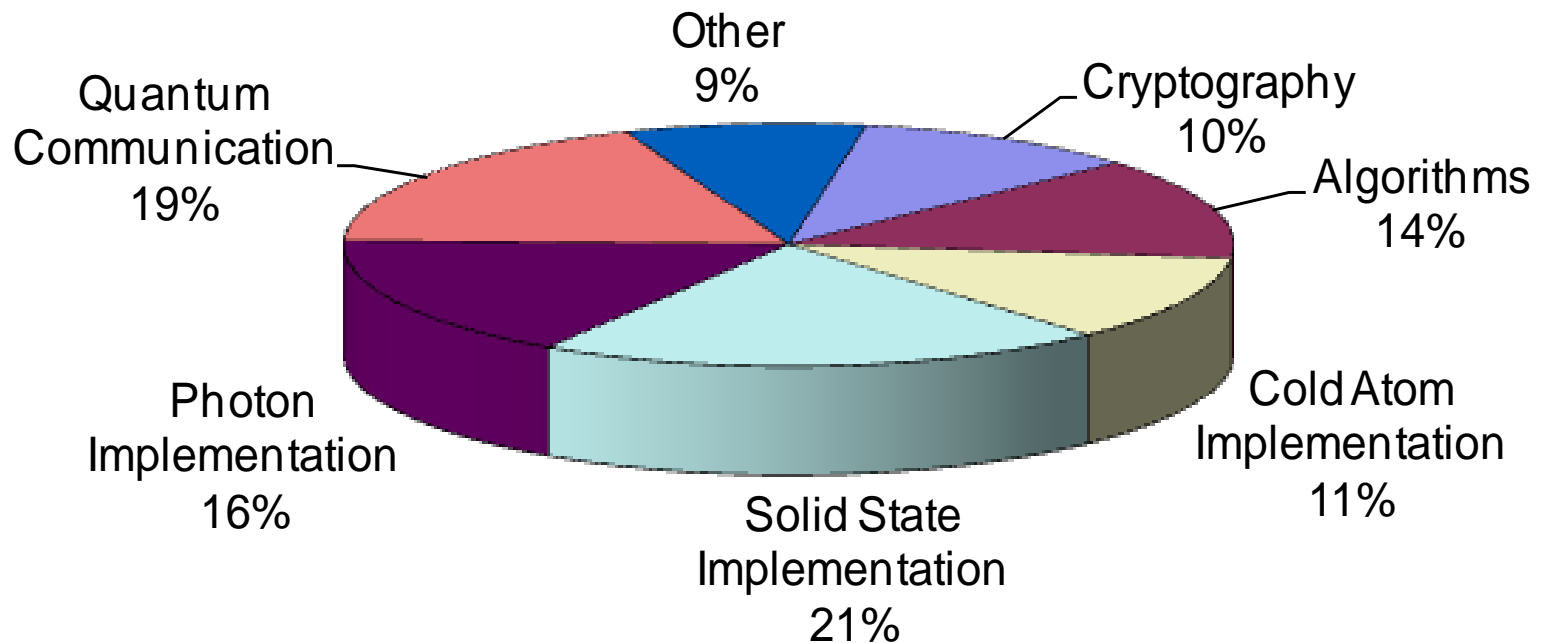
# Results from the Questionnaire

# Number of groups asked

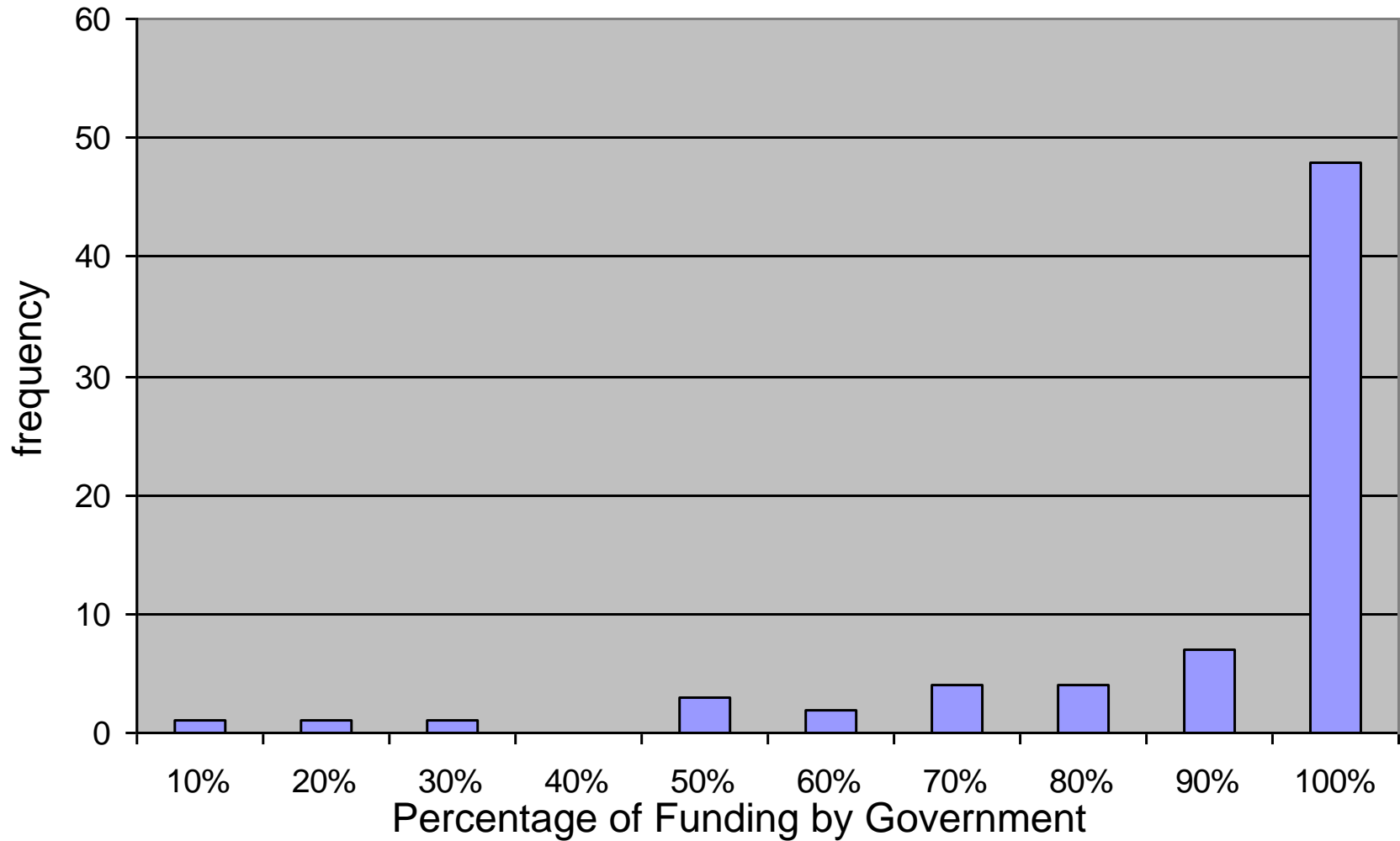
with answer without answer



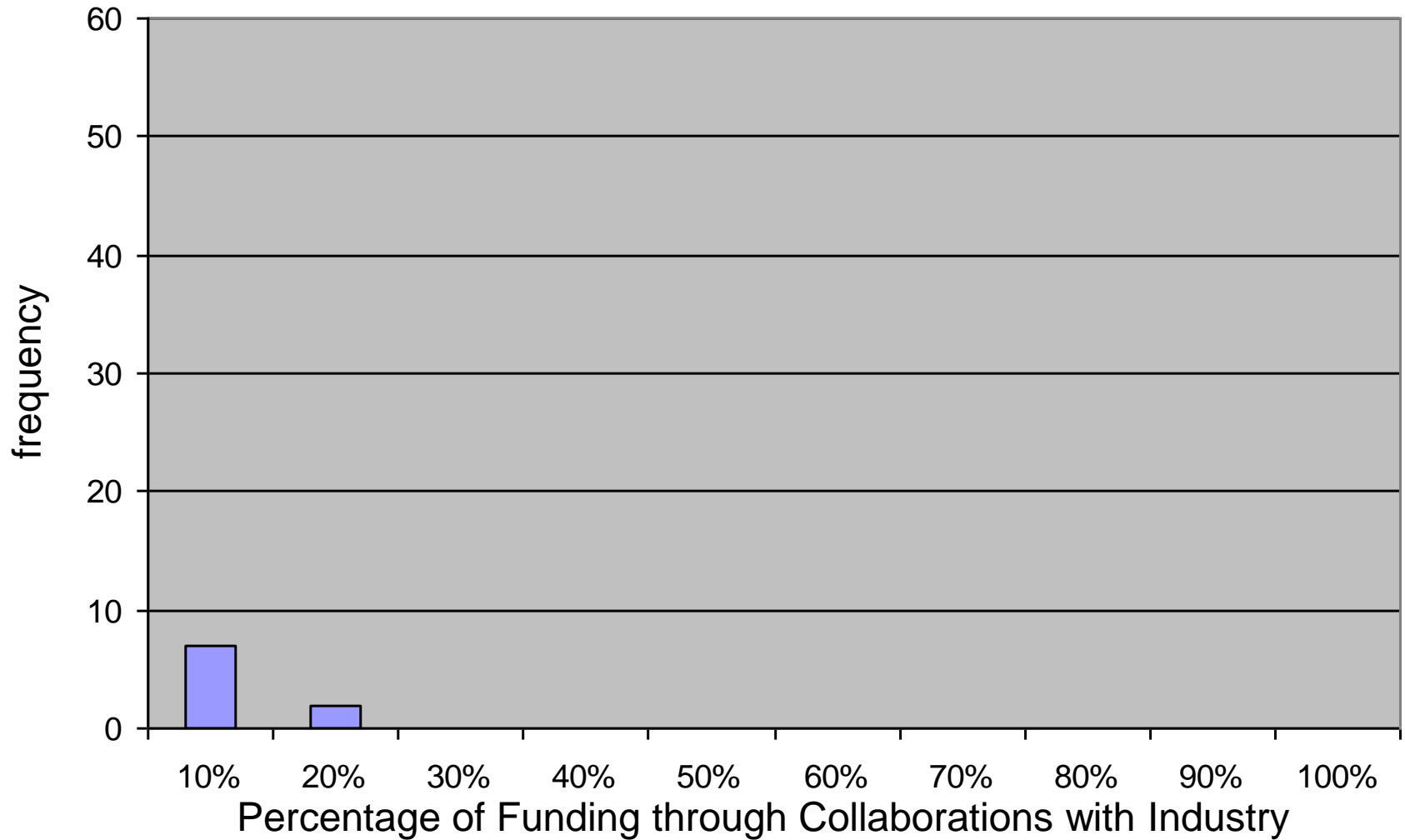
# Scientific Focus of Groups outside Europe



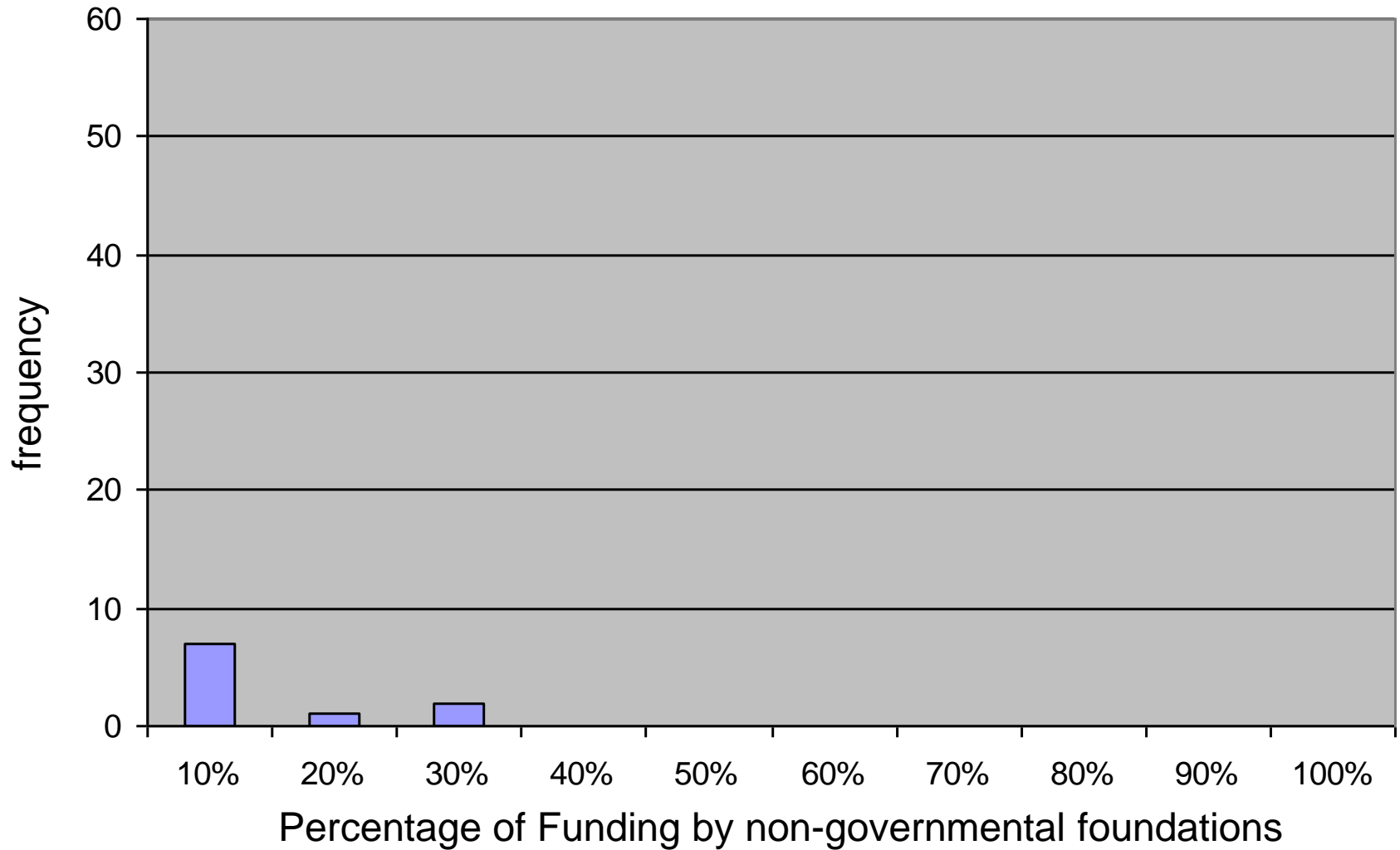
# Proportion of Governmental Funding



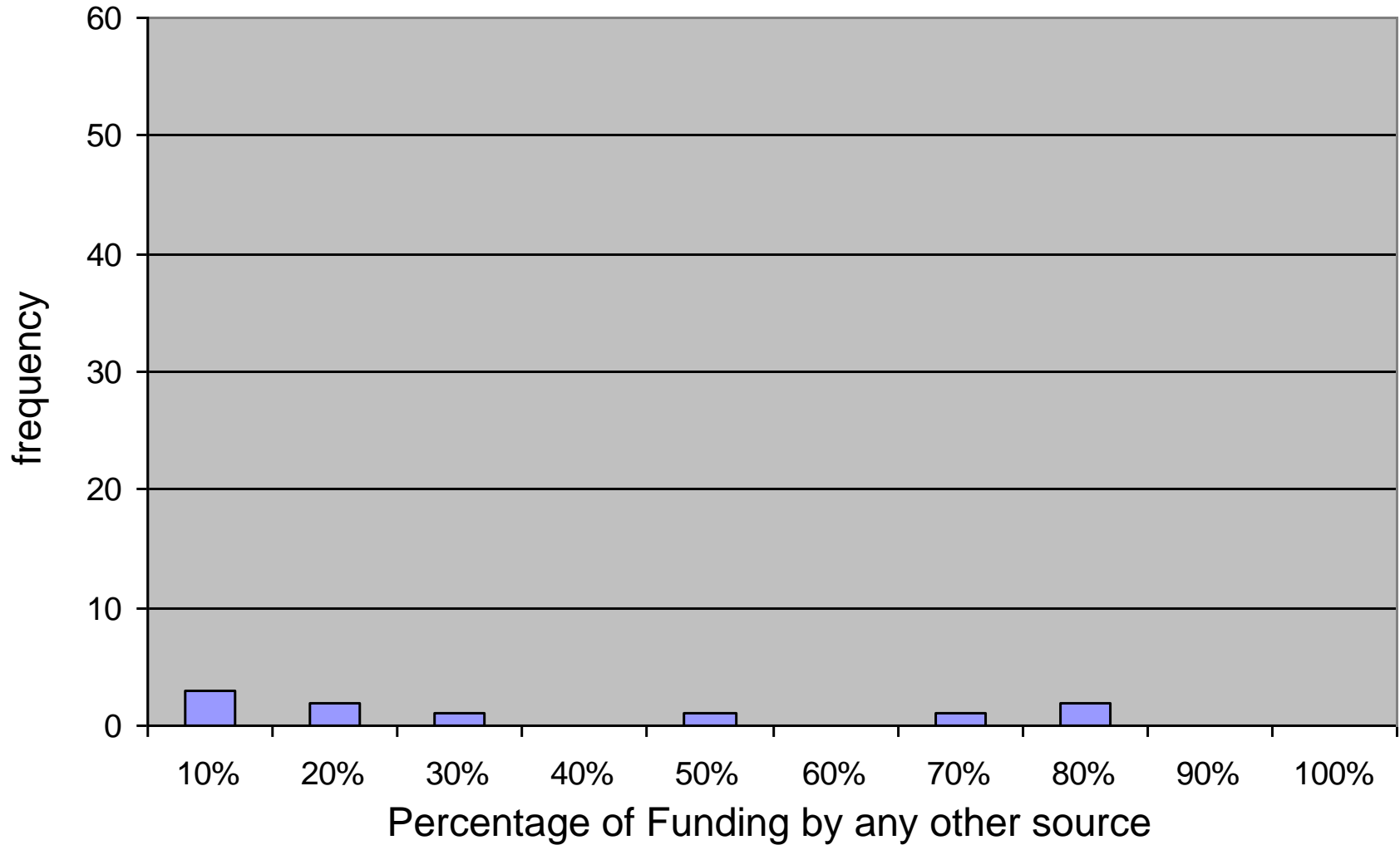
# Proportion of Industry Funding



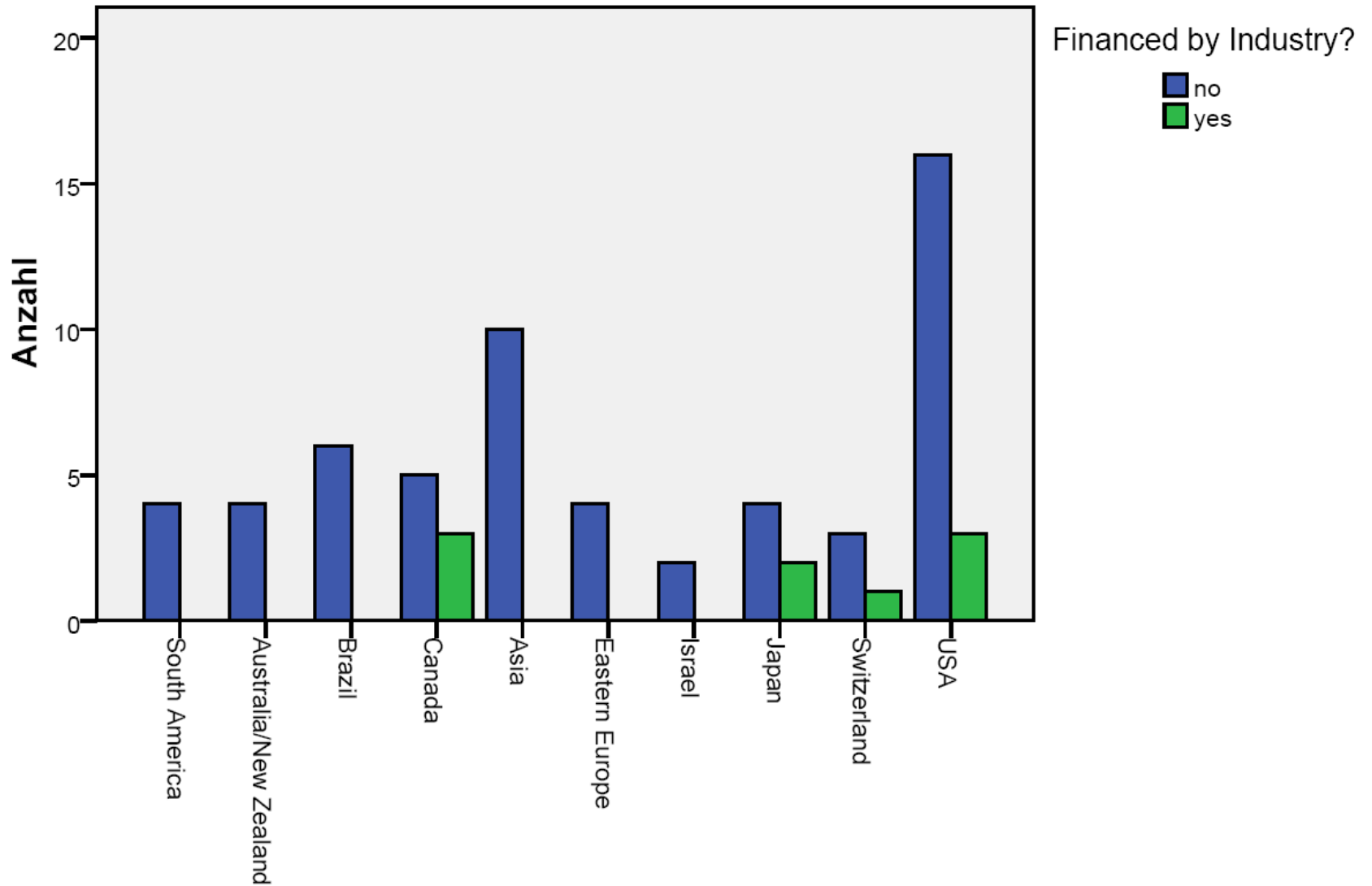
# Proportion of Funding from non-governmental Foundations



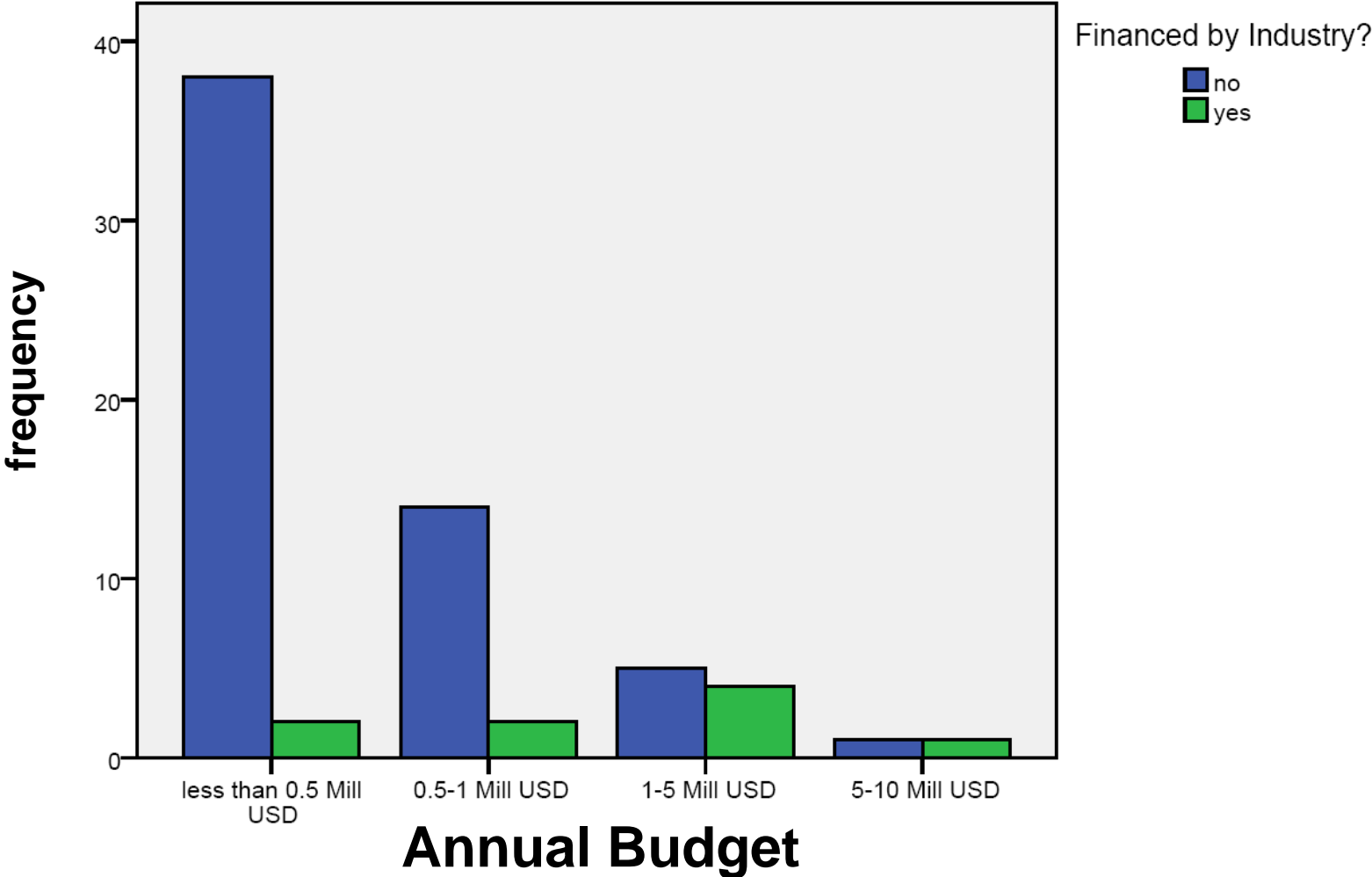
# Proportion of Funding by other Sources



# Industrial Funding is restricted to groups in industrialized countries



# Groups with larger budgets tend to be more often funded by industry



# Large Research Networks

An important share of the QIPC funding goes into large research networks and centers. For example:

**National Labs:** NIST (USA)

**National Funding Programs:**

USA: NSEC, NNIN, MRSEC

Japan: CREST (12 groups), ERATO, ICORP

**Local University-based Centers:**

Yale Center for Quantum Information, Harvard Center,

Institute for Quantum Information Caltech

Centre for Quantum Computer Technology Australia

# Funding Agencies open to European Researchers

## **USA:**

DARPA

NSA

ONR

IARPA

## **Japan:**

ICORP

CREST

ERATO

Political 'Rationale' (?):

External expertise helps to achieve research goals of national interest faster

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