# Beyond R&D: Technological, Innovation and Entrepreneurship (TIE) funds to Chilean Universities during 2018

## Overview

### The problem

Universities play a key role in National Innovation Systems, not only in conducting research, but also in supporting industries' technical change (Nelson and Rosenberg, 1993).

Although there is vast literature regarding Chilean public programs supporting R&D within universities (Benavente et al., 2012; Boisier and Cevallos, 2019), **little attention has been paid to the role of universities as recipients of TIE funds from the Central Government**.

In this context, this work represents the first attempt to map the relation between the Chilean Central Government and universities in this field. We will try to answer how much, to whom, and from what institutions and programs these resources are allocated.

### First findings

The Chilean Central Government's spending on Science, Technology and Innovation (STI) represented 1.43% of total spending for the year 2018, of which 0.12% corresponds to TIE programs transferred to universities (Figure 01), which is approximately £50,000,000.

Three main institutions build links with universities for these purposes: 8 programs from **CORFO**, the national development agency, which account for more than 70% of the funds; 13 regions through **FIC-R** (regional innovation funds, managed by the Ministry of Internal Affairs), and **FIA** (agricultural innovation).

The funds were directed to 39 universities and 6 spin-off university institutions. The distribution of funds among these institutions is: 40% to the top 5 universities; 13% to the rest of top 10 universities; 5% to university spin-offs; and the remaining to the rest of universities.

### The data

Budget execution data come from the DIPRES website. STI data include 182 public programs from 14 different ministries.

**CORFO** data are based on the Transparency Law, specifically on the records of legal persons receiving public funds. **FIC-R** data are based on DIPRES budget execution data. FIA data were provided directly by the agency to the author.

The university rankings are based on QS World University Ranking for 2019.

The programs selected are designated as STI and TIE according to the methodology presented by DIPRES (2018).

**Figure 01. Central Government spending in 2018**

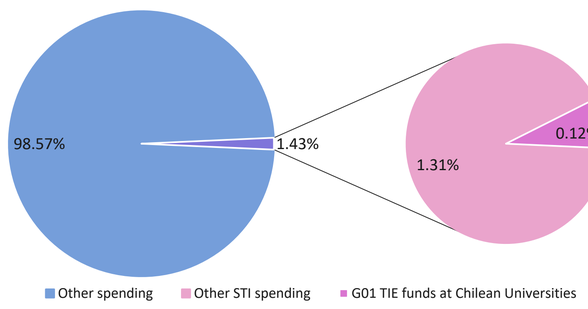



**Figure 02. Proportion of funding for TIE programs allocated to Chilean universities during 2018, by program**

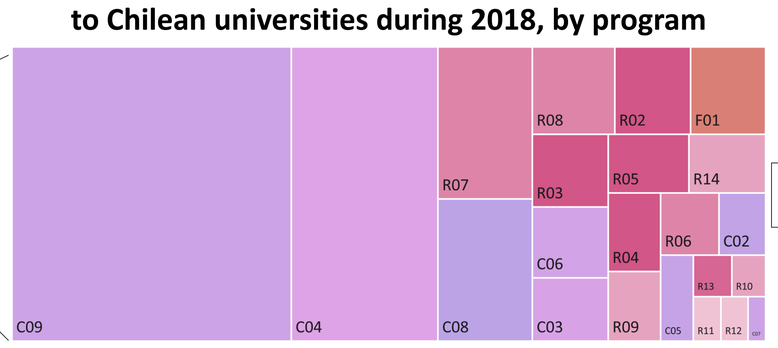
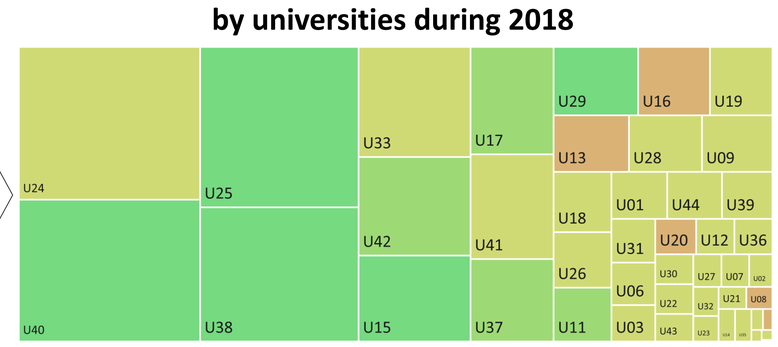
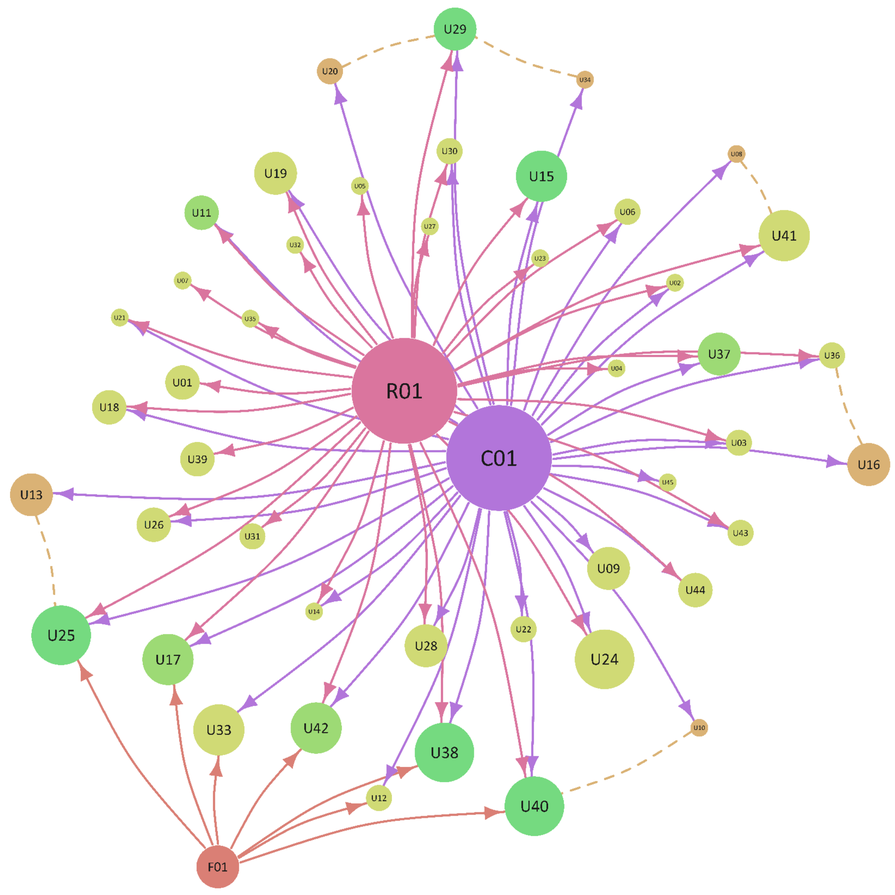



**Figure 03. Proportion of public TIE resources received by universities during 2018**




# The relation between Central Government and universities on TIE programs

**Figure 04. Transfer of funds from TIE programs to universities for 2018, by institution**




### Key features of the network

Every top 10 university within the network receives funds from at least **CORFO** and **FIC-R** (Figure 04). All university spin-offs in the network are related to their university hosts, which also receive funds from the same source, **CORFO**. These are the only closed triads in the network.

**CORFO** funds 29 universities and 6 spin-offs of them. This is executed through 8 different programs (which are managed by different departments within the institution), establishing 102 different connections (Figure 05).

The regional innovation fund, **FIC-R** finances 34 universities in 13 of the 15 regions of the country, through 75 different linkages (Figure 06).

Finally, **FIA** finances 7 different universities (Figure 04).

**Figure 05. CORFO's TIE programs funds to universities in 2018, by region**

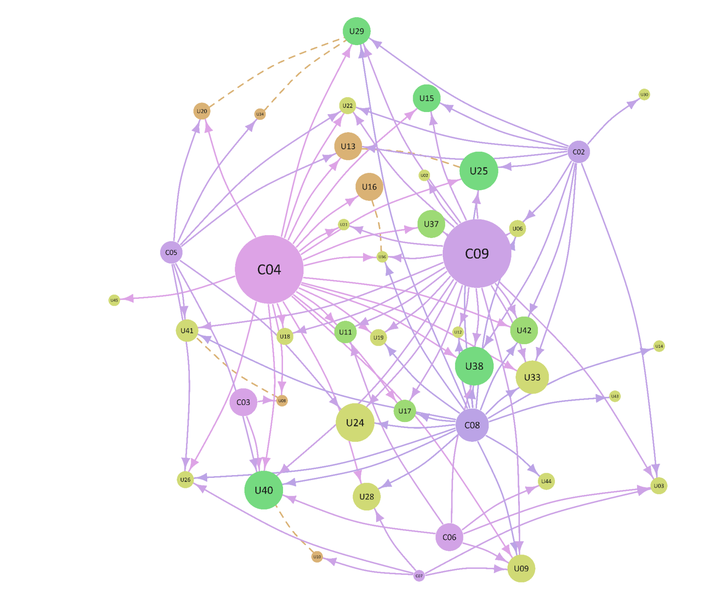
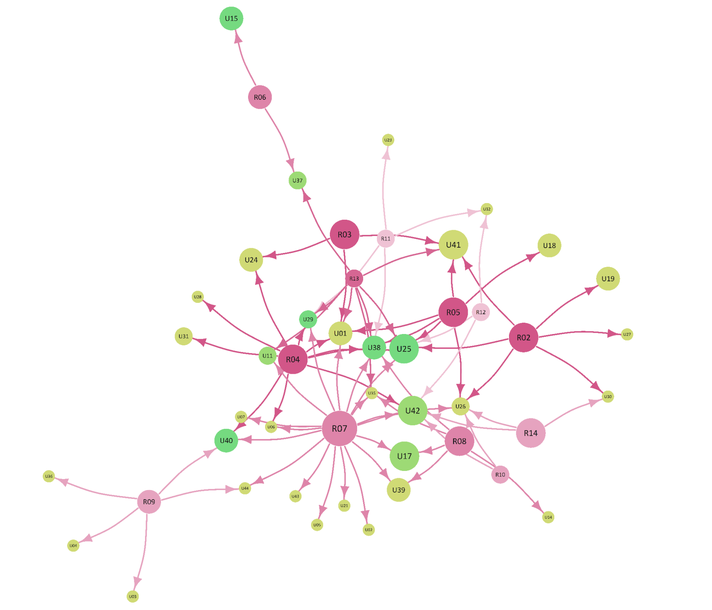



**Figure 06. FIC-R funds to universities in 2018, by region**




**Box 01. Legends**

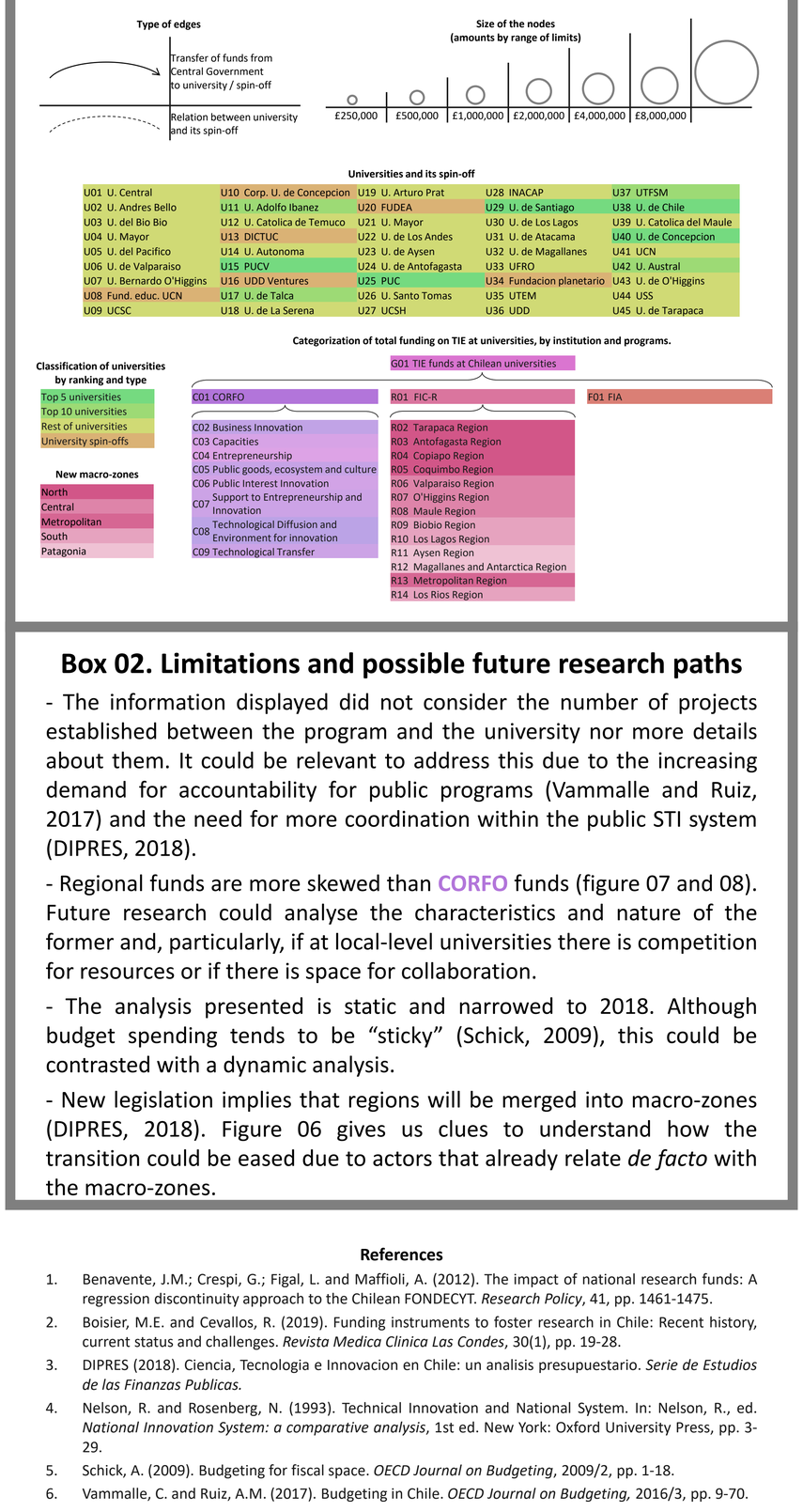



**Figure 07. Lorenz curve for the distribution of CORFO and FIC-R resources on TIE programs to universities**

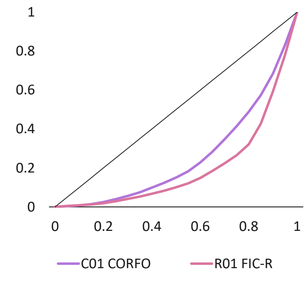
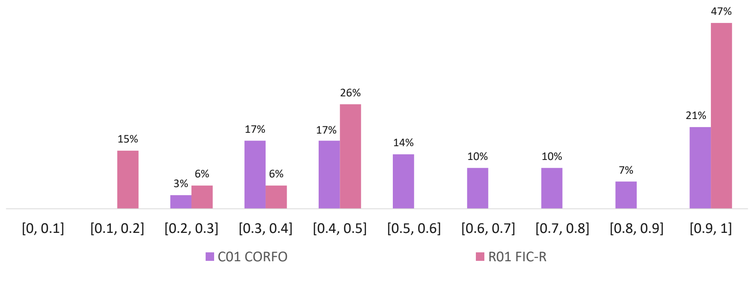



**Figure 08. Frequency of universities' constraint level for CORFO and FIC-R funds (not including spin-off)**




**Box 02. Limitations and possible future research paths**

- The information displayed did not consider the number of projects established between the program and the university nor more details about them. It could be relevant to address this due to the increasing demand for accountability for public programs (Vammalle and Ruiz, 2017) and the need for more coordination within the public STI system (DIPRES, 2018).

- Regional funds are more skewed than **CORFO** funds (figure 07 and 08). Future research could analyse the characteristics and nature of the former and, particularly, if at local-level universities there is competition for resources or if there is space for collaboration.

- The analysis presented is static and narrowed to 2018. Although budget spending tends to be "sticky" (Schick, 2009), this could be contrasted with a dynamic analysis.

- New legislation implies that regions will be merged into macro-zones (DIPRES, 2018). Figure 06 gives us clues to understand how the transition could be eased due to actors that already relate *de facto* with the macro-zones.

**References**


1. Benavente, J.M.; Crespi, G.; Figal, L. and Maffioli, A. (2012). The impact of national research funds: A regression discontinuity approach to the Chilean FONDECYT. *Research Policy*, 41, pp. 1461-1475.
2. Boisier, M.E. and Cevallos, R. (2019). Funding instruments to foster research in Chile: Recent history, current status and challenges. *Revista Medica Clinica Las Condes*, 30(1), pp. 19-28.
3. DIPRES (2018). Ciencia, Tecnologia e Innovacion en Chile: un analisis presupuestario. *Serie de Estudios de las Finanzas Publicas.*
4. Nelson, R. and Rosenberg, N. (1993). Technical Innovation and National System. In: Nelson, R., ed. *National Innovation System: a comparative analysis*, 1st ed. New York: Oxford University Press, pp. 3-29.
5. Schick, A. (2009). Budgeting for fiscal space. *OECD Journal on Budgeting*, 2009/2, pp. 1-18.
6. Vammalle, C. and Ruiz, A.M. (2017). Budgeting in Chile. *OECD Journal on Budgeting,* 2016/3, pp. 9-70.