

# Selecting an Optimal Figure Skating Judging System

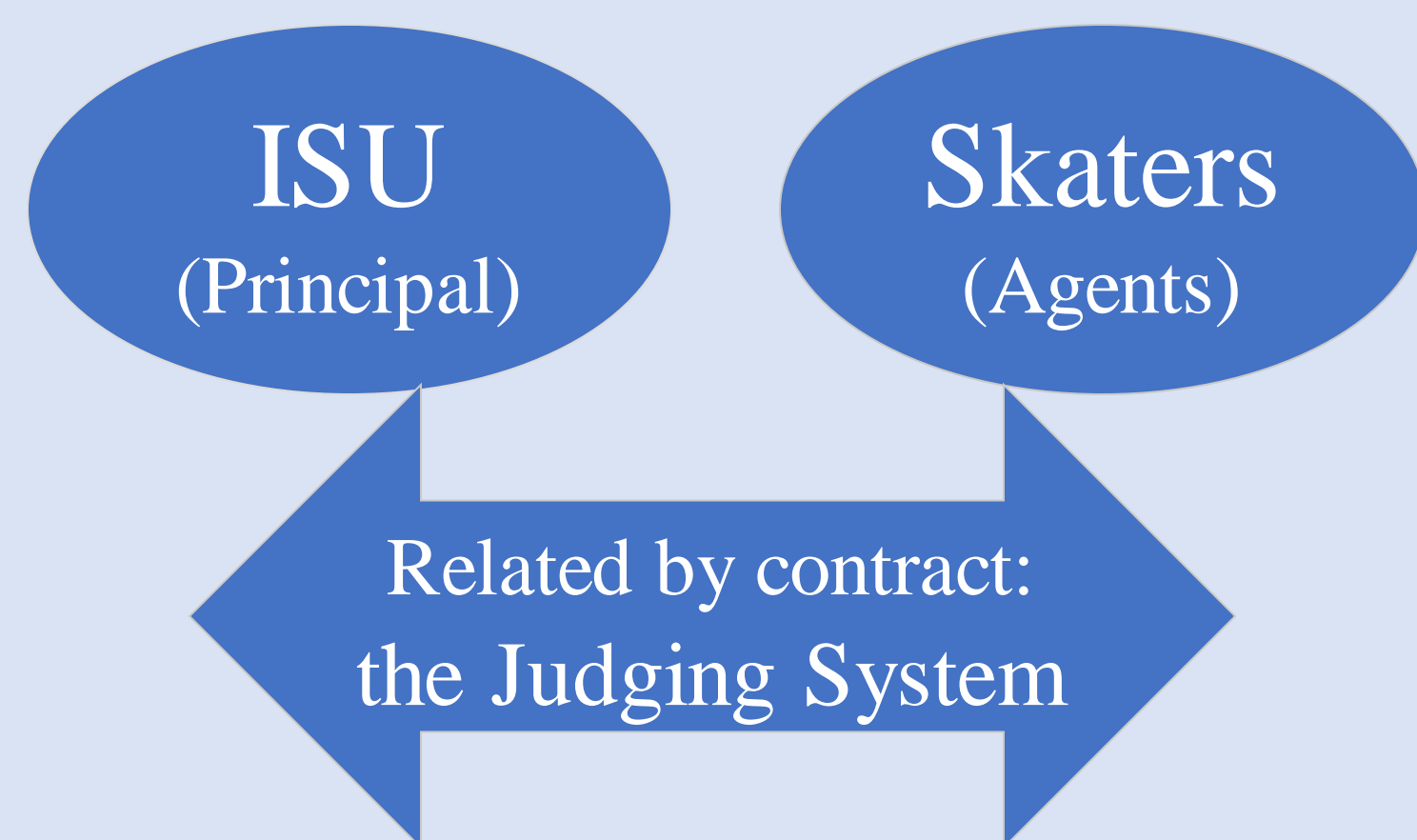
Senior Thesis in economics by Patrick Costley. Advised by Dr. Kyle Woodward.

## Introduction

The International Skating Union must select a judging system that is fair for skaters and incentivizes desirable performances.

## Background

The judging system is the contract between ISU and skater.



## Research Question

How can the ISU select a judging system to award points to competitive skaters such that the optimal performance for skaters also maximizes viewership?

## Theoretical Model

$$\max_{\rho} V(x(\phi)), \text{ s.t. } \phi \text{ maximizes } \rho(x(\phi)), \text{ and } \phi_1 + \phi_2 = 1.$$

Effort determines performance, which determines points for the skater and viewership for the ISU. Maximize viewership subject to constrained effort by setting the derivative of viewership with respect to effort equal to zero.

## Theoretical Results

**Desirability Effect:** assign more desirable skills more points.

$$\uparrow \frac{dV}{dx_s} \text{ viewership/performance} \quad \uparrow \frac{d\rho}{dx_s} \text{ points/performance}$$

**Difficulty Effect:** assign more difficult skills fewer points.

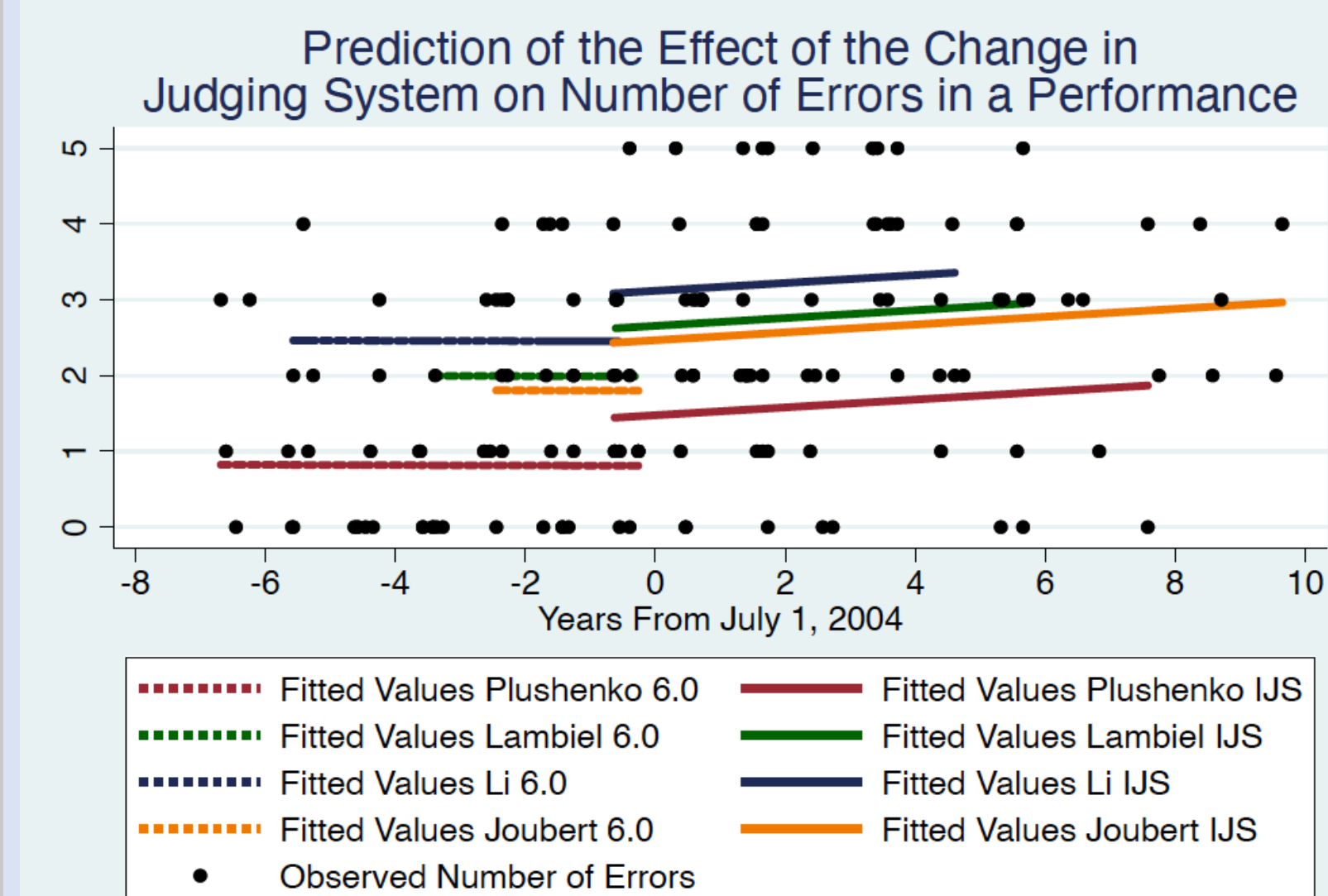
$$\uparrow \frac{dx_s}{d\phi} \text{ points/effort (difficulty)} \quad \downarrow \frac{d\rho}{dx_s} \text{ points/performance}$$

## Empirical Model

$$\chi = \alpha + \beta_1 IJS + \beta_4 \text{timetochange} + \beta_5 \text{timefromchange} + \delta_{1,\dots,n} \text{skater} + \epsilon$$

What is the effect (controlling for skater) of the treatment of the IJS judging system and time on the number of errors in performances?

## Empirical Results



**Results indicate the existing judging system is suboptimal and could be improved by reducing the points awarded to difficult skills.**