

# Better Safe than Sorry: The Impact of Green Card Delays on the Propensity of Foreign STEM Doctorates to Work at Startups

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## Abstract

In October 2005, newly-binding country-specific green card quotas led to multiple-year delays in the processing of EB-2 permanent residency visa applications for Chinese and Indian doctorates. This created an incentive for Chinese and Indian doctorates to seek employment at established firms over startups as the former are generally less likely to shut down prior to the resolution of visa delays. Using a difference-in-differences approach, I find that temporary resident STEM doctorates subject to EB-2 delays were 7.2 percentage points (42%) less likely to work at a startup in their first decade of employment after the emergence of visa delays.

## Introduction

- Startups are an important driver of innovation, economic growth, and a dynamic economy, but have a high rate of failure [3, 1].
- High-skilled immigrants are important to startup success [2] and have increased levels of patenting relative to natives [8, 4, 7].
- Oct. 2005: China and India begin to face multiple-year EB-2 green card delays.
- If employer goes out of business while delayed, must find new employer and get in back of the green card line.
- “Better Safe than Sorry”: incentive to avoid firms with higher risk of failure (e.g., startups) before receiving green card.

## Related Findings from Previous Studies

- EB-2 visa delays reduce US stay rates of foreign-born STEM PhDs [9, 6].
- Foreign-born STEM PhDs whose first job is in industry are as likely as US PhDs to receive offers from startups but 50% as likely to accept offer [10].
- Workers exhibit a sudden increase in job transition rates upon receiving permanent residency [5, 11], with a greater response for Chinese and Indian workers who were subject to green card delays [11].

## Data

- NSF’s Survey of Doctorate Recipients (SDR): nationally-representative longitudinal sample of STEM PhDs.
- SDR asks if employer is a new business  $\leq 5$  years old.
- Analytical sample: SDR PhDs graduating between FY 2001 and FY 2010 who reported working in a job at a US for-profit nonacademic employer within 10 years post-PhD.

## Empirical Specification

Person-level difference-in-differences:

$$Startup_{icg} = \alpha + \gamma Treat\_group_{ic} + \delta Delay_{icg} + \mathbf{X}_i\beta + \lambda_c + \lambda_g + \varepsilon_{icg},$$

- $Startup_{icg} = 1$  if PhD  $i$  from country  $c$  who graduated in year  $g$  reports working in startup within 10 years post-PhD.
- Treatment group: STEM PhDs from China and India who were temporary residents at time of graduation.
- Control group: All other STEM PhDs.
- Treatment period begins in FY 2005 when first warnings of EB-2 visa delays issued by US Department of State.
- $Delay_{icg} = 1$  for the treatment group during the treatment period;  $\delta$  gives the impact of EB-2 delays on the propensity to work at startups early in career.
- Controls ( $\mathbf{X}_i$ ) include residency status, foreign-born status, sex, race, age, PhD-length, primary source of financial support during PhD, marital status and child-at-home status at time of PhD, education level of parents, fine field of study FEs, PhD institution FEs, and survey year FEs. Also include country-of-birth FEs ( $\lambda_c$ ) and PhD cohort FEs ( $\lambda_g$ ), the latter absorbing the treatment period indicator.

## Results

- EB-2 delays reduced likelihood that an industry-employed STEM PhD would work in US startup within a decade post-PhD by 42% (7.2 pp), driven by a 48% (9.2 pp) reduction among Chinese PhDs.
- Chinese STEM PhDs were 1.7 percentage points less likely to work at a startup in first decade of career for each additional year of delay.
- Indian PhDs working in US industry do not appear to change their propensity for working in startups in response to visa delays.
- Evidence suggests that Indian PhDs more likely than Chinese PhDs to avoid EB-2 delays by pursuing qualifications needed for EB-1 visa and are more likely to view Canadian permanent residency as a substitute for US permanent residency.
- Results robust to excluding US-born PhDs from control group, including group-specific linear trends, and broadening the analytical sample to include those employed outside industry.

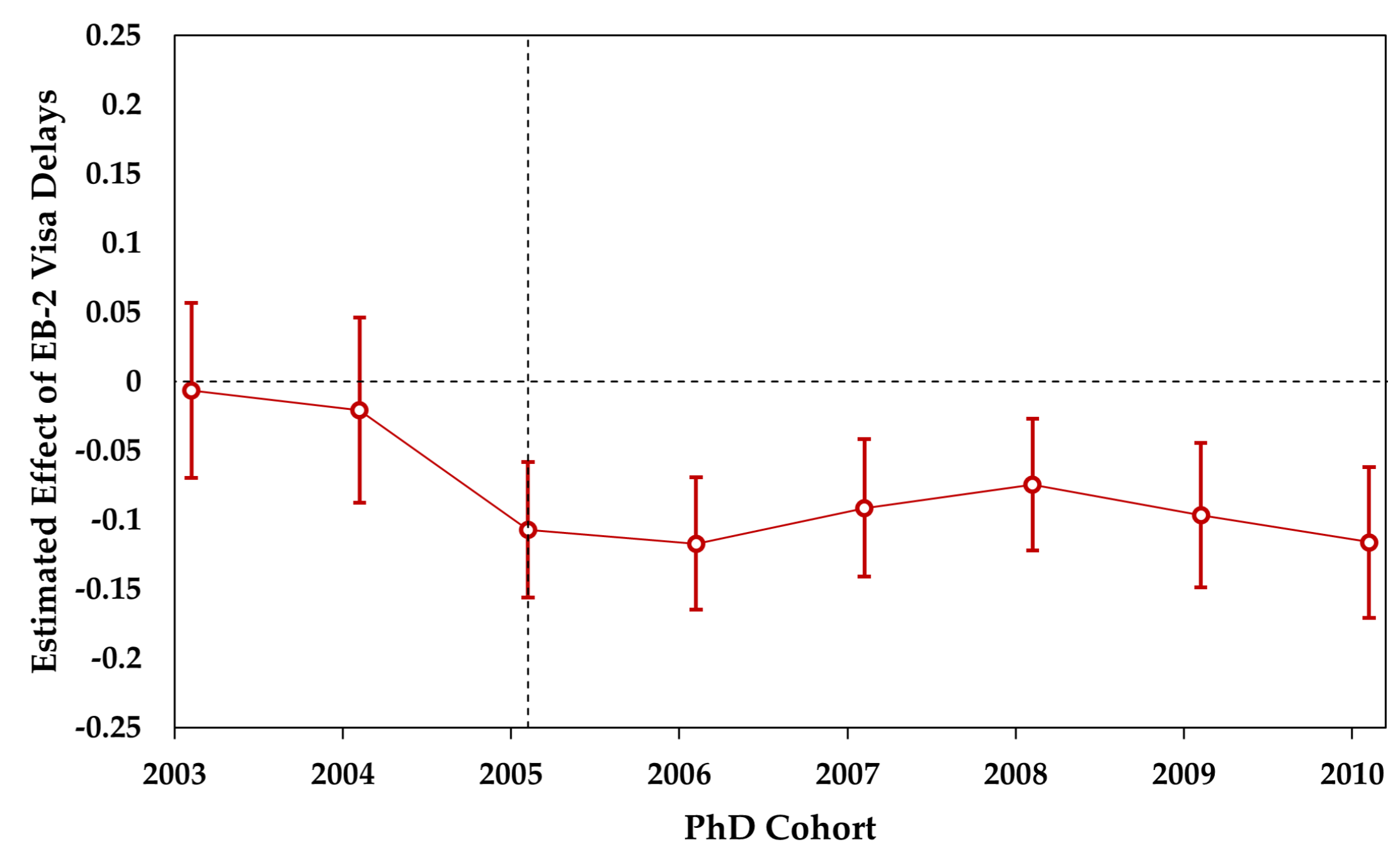


Figure 1: Effect of EB-2 Visa Delays on Propensity of Chinese STEM PhDs to Work in Startups by Cohort

## Conclusions

- EB-2 visa delays reduced likelihood that Chinese STEM PhDs would work in startups early in their career by 48%.
- Exempting STEM PhDs from green card quotas would likely increase the propensity of Chinese STEM PhDs to work in startups.

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