Building the Education Revolution: The Employment Effects of Fiscal Stimulus in Australia

Juha Tervala, PhD[1]; Timothy Watson, PhD[2]

[1]University of Helsinki, [2]Australian National University and Department of the Prime Minister and Cabinet

Abstract

This paper estimates the causal impact of the Great Recession-era Building the Education Revolution (BER) school infrastructure stimulus program on labour market outcomes in Australia. The evidence suggests that the program provided value for money, with costs per job-year saved most likely below $8,500 ($US 8,000) on average between 2009 and 2012. In 2009, the main year of program impact, roughly one third of employment benefits related to lowering unemployment, and two-thirds reduced labour force exit. Unemployment reductions were concentrated amongst men, while program effects on employment appear more equally distributed by gender than would be anticipated based on the gender composition of the construction industry. Employment benefits were highly concentrated amongst 25 to 34 year olds, and were not greater in regions experiencing higher unemployment at the outset of the program.

Introduction

The $16.9 billion Building the Education (BER) program was a major school infrastructure building program that was the largest individual component of the Australian Government's second major Global Financial Crisis (GFC) stimulus package, the $42 billion Nation Building and Jobs Plan announced in February 2009. The Program saw the construction of 24,000 infrastructure projects in 9,500 schools up until May 2012 (Lewis et al., 2014). While the `School Halls Program' as it became popularly known became associated with government waste and mismanagement in public opinion, no academic studies have yet sought to quantify how effective the BER was at achieving its primary objective, which was to help save jobs.

This study is the first extensive academic evaluation of the BER program and utilises a never before used administrative dataset recording its construction expenditure. It seeks to address the question of whether the BER was a cost-effective stimulus program compared to other GFC stimulus programs, particularly with respect to employment creation. The study is situated within the emerging literature on geographic cross-sectional fiscal multipliers (Chodorow-Reich, 2019), and follows in the footsteps of Buchheim and Watzinger (2023) who study a similar school infrastructure stimulus program in Germany following the GFC. This paper uses a generalised differences-in-differences (DiD) approach to identify the causal impact of BER construction expenditure on employment in Australian Statistical Level 4 (SA4) regions. Schools per capita are used as instruments for BER expenditure per capita to address concerns that stimulus expenditure was likely endogenous to local economic conditions. A Bayesian dynamic stochastic general equilibrium (DSGE) model is also estimated to relate cost per job-year saved estimates to approximate `closed economy, no monetary policy response' output multipliers as Chodorow-Reich (2019).

Methods

Following Buchheim and Watzinger (2023), this paper adopts a generalised DiD approach to estimating the employment gains β_Y associated with the BER program for each year between 2009 and 2012. Estimates for β_Y reflect the impact of all past and expected future BER spending on average employment in the average SA4 region in year Y. Employment ($E_{i,t}$) gains are measured relative to the December quarter of 2008, the last quarter before the program was announced. The dynamic response of employment to program spending is described by the sequence β_Y, and summing the employment responses delivers estimates for the average employment difference in cumulative terms over that time period. The model to estimate the β_Y is given as follows: $E_{i,t} = \alpha_i + \lambda_i + \alpha_i \times t + \lambda_t \times State_j + \beta_{pre} BERp.c_i \times I(t \in [2007Q4, 2008Q4]) + \sum_{Y=2009}^{2012} \beta_Y BERp.c_i \times I(t \in [YQ1, YQ2]) + \beta_{post} BERp.c_i \times I(t \in [2013Q1, 2014Q4]) + \sum_{t:t\neq 2008Q4} \lambda_t \times X'_i \Gamma_t + \delta pop_{i,t} + \epsilon_{i,t}$. The primary independent variable is government expenditure in each SA4 under the BER program between 2009 and 2012 measured as a proportion of the working age population in 2008 ($BERp.c_i$). Control variables X'_i include additional SA4 characteristics that may be correlated with both employment and BER expenditure.

Empirical results

The BER program created roughly 8.58 jobs per $100,000 of program expenditure in 2009. This implies **a cost per job-year saved of $11,661 ($US 9,212) in 2009. Roughly one third relate to reductions in unemployment, and two thirds relate to reduced labour force exit.** Comparison: American Recovery and Reinvestment Act, ARRA (Chodorow-Reich, 2019): costs per job year ranging from $US 26,316 to $US 131,579 and the German public investment program (Buchheim and Watzinger, 2023): $US 32,800.

Program effects by gender: The BER program is estimated to have created 3.94 job-years per $100,000 for women in 2009, or just under two-thirds of the 5.99 job-years per $100,000 for men. However, the impact of the program on men and women's employment is statistically indistinguishable over the entire 2009 to 2012 period. The BER **reduced unemployment amongst men** by a statistically significant 2.64 job-years per $100,000 in program expenditure in 2009, and a statistically insignificant 0.47 job-years for women. There were **3.48 more women in the labour force** in 2009 per $100,000 in program expenditure.

Employment effects by age: Employment effects are strongly concentrated amongst those aged 25-34. Statistically significant program effects at the 5% significance level are only detectable only amongst 25-34 year olds and 35-44 year olds.

Geographic spillovers: The preferred models indicate that controlling for regional spillovers has no statistically significant impact on the employment estimates.

State dependent employment effects: Employment benefits were not greater in regions experiencing higher unemployment at the outset of the program.

Relevance of results for national employment: Australian SA4 regions are relatively heterogeneous in size, and analysis at the average SA4 level might provide a misleading perspective of average national employment effects. At the national level, employment effects are insignificant at conventional significance levels**.** We repeat the analysis only with reference to the 25-34 year old cohort, where statistically significant results were revealed at the SA4 level. **Estimation with employment data for 25-34 year olds alone yields estimates of aggregate job-years saved of over 500,000 and 800,000 in 2009 and 2012 respectively, both statistically significant at the 5% level. This translates into an aggregate cost per job-year saved between 2009-2012 of $8,557 ($US 8,086).**

Output multipliers: We approximate `closed economy, no monetary policy response' output multipliers based on the approach of Chodorow-Reich (2019). We find a geographic cross-sectional fiscal multiplier of 9.9.

Theoretical results

We develop a Bayesian DSGE model that can motivate large fiscal multipliers utilising learning-by-doing in the production technology (endogenous productivity), following Enger and Tervala (2018). Support for the learning-by-doing process (endogenous productivity) is found in the data. Fluctuations in employment have a strong and persistent effect on productivity (human capital). Simulated cumulative output multiplier for the BER over the entire period is 10.2.

Conclusions

The empirical and theoretical results suggest that a fiscal stimulus program consisting of many small infrastructure projects can be a highly cost-effective form of stimulus during recessions. The BER provided high value for money, contrary to popular opinion. Factors that contributed to the programs success most likely include targetting a highly cyclically sensitive industry; geographically dispersing projects broadly across the country; the crowding-in of private investment; the speed to peak construction during the most intensive stage of the crisis; and the focus on promoting skill development and human capital formation amongst younger Australians.

Contact

Juha Tervala
University of Helsinki
Email: juha.tervala@helsinki.fi
Website: https://blogs.helsinki.fi/jtervala/
Phone: +358505862968

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