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Technical Appendix

Beyond the Postcard: Unlocking the economic power of Sydney's global brand



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Access **Economics**

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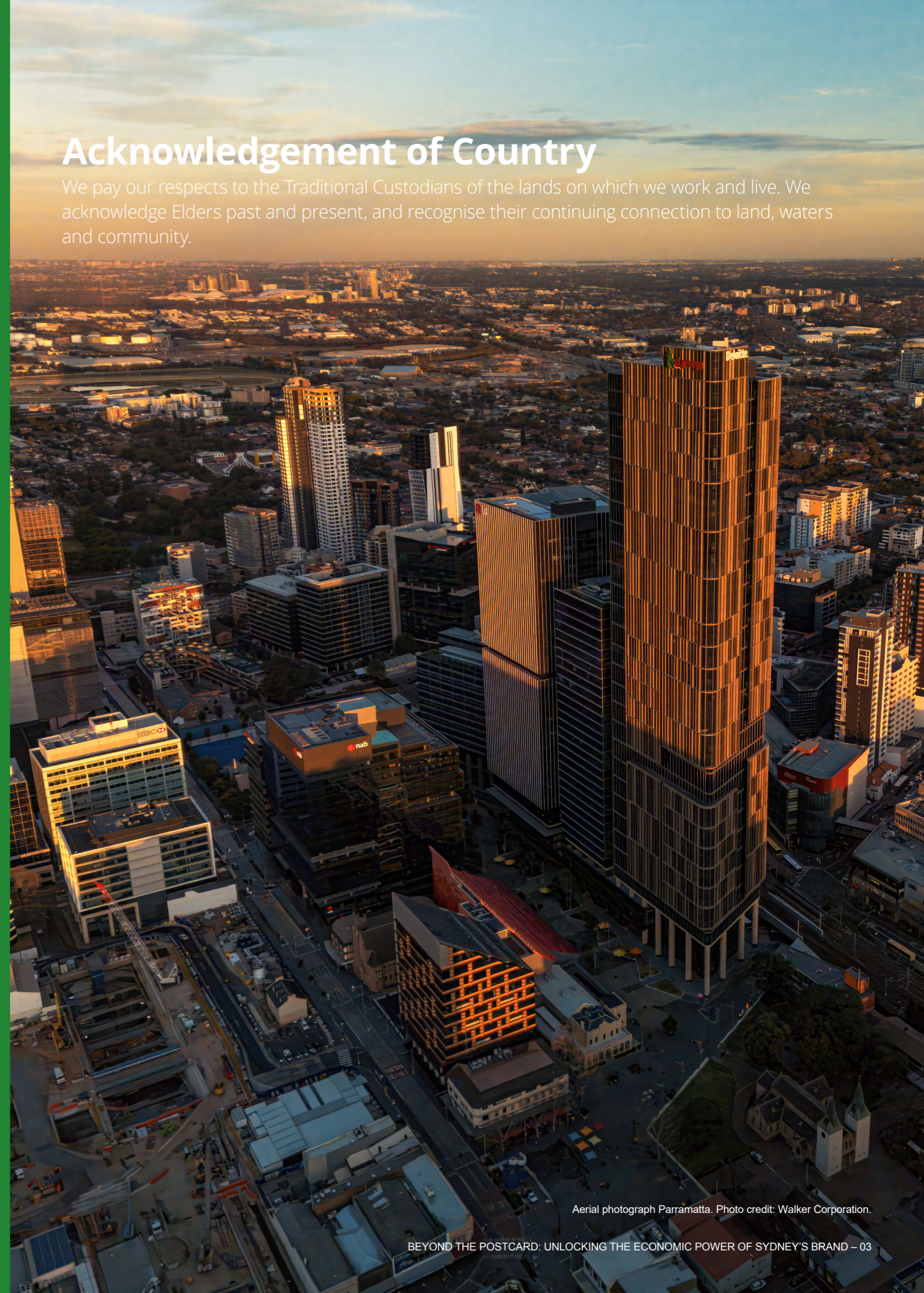
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Acknowledgement of Country

We pay our respects to the Traditional Custodians of the lands on which we work and live. We acknowledge Elders past and present, and recognise their continuing connection to land, waters and community.



Aerial photograph Parramatta. Photo credit: Walker Corporation.

Introduction

A decade of research from the Committee for Sydney consistently identified a misalignment between what Sydney is and what the world perceives the city to be. This technical appendix discusses the economic analysis underpinning the outcomes discussed in the Committee for Sydney’s Beyond the Postcard: Unlocking the economic power of Sydney’s global brand report.

An introduction to Sydney Global

In 2025, the Committee for Sydney launched Sydney Global¹ to address a simple but critical challenge: Sydney is not fully understood on the world stage.

Sydney remains one of the world’s most recognisable cities – iconic and globally admired. But peer cities are out-competing us through more deliberate and cohesive efforts to shape global perception and reinforce their strengths across multiple audiences.

Sydney Global aims to equip Sydney and Sydneysiders with a clear, shared narrative for the city. One that reinforces what Sydney is good at while challenging outdated or incomplete perceptions of lesser-known strengths. This is not about a costly large-scale campaign. It’s about alignment. Aligning how Sydney presents itself so that its performance and perception reinforce one another.

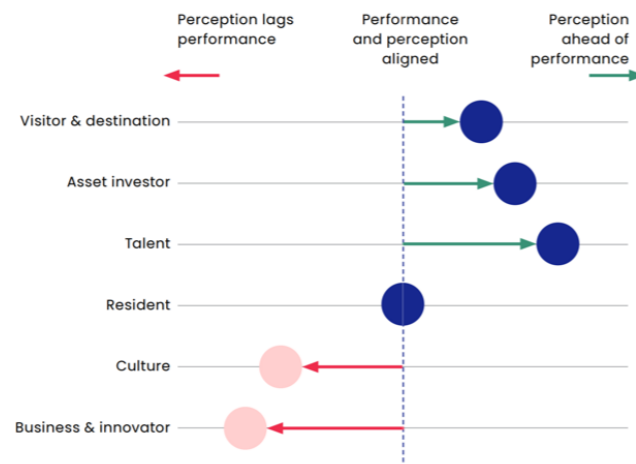
Purpose of this work

The Committee for Sydney’s Beauty Runs Deep Benchmarking Report² identified a gap between Sydney’s global perception and its performance across six brand pillars reflecting a missed economic opportunity to harness potential investment, talent and growth (as shown in Figure 1).

Where perception is ahead of performance – Sydney’s brand is not appropriately conveying full capabilities and opportunities; and where perception lags performance – Sydney is trading on out-of-date, or narrow external perceptions and there’s a risk that these fall away.

To support the development of a strategic city brand narrative for Sydney,³ the Committee for Sydney requested Deloitte Access Economics to develop an approach to quantify the potential economic benefits of enhancing global perceptions of Sydney’s Brand - closing the gap in perception and performance.

Figure 1: Divergence and convergence of brand



Source: Beauty Runs Deep Benchmarking Sydney’s Brand 2025

Our approach and key findings

The methodology leveraged a globally recognised dataset on perceptions - Brand Finance’s Global Soft Power Index (GSPI)⁴. This index measures international perceptions of nation brands and ranks countries by their ability to influence through attraction and persuasion. This cross-country panel dataset, in combination with economic indices, allows for analysis of how differences in global soft power are associated with economic performance.

Regression analysis was applied to estimate how changes in soft power translate into future GDP per capita. The key findings from this analysis identified that if Sydney strengthens its global standing by just one point on the GSPI it could translate into higher income per person on average across the city in the following year. When scaled across Greater Sydney’s population, that uplift equates to approximately \$3.3 billion in additional economic output.

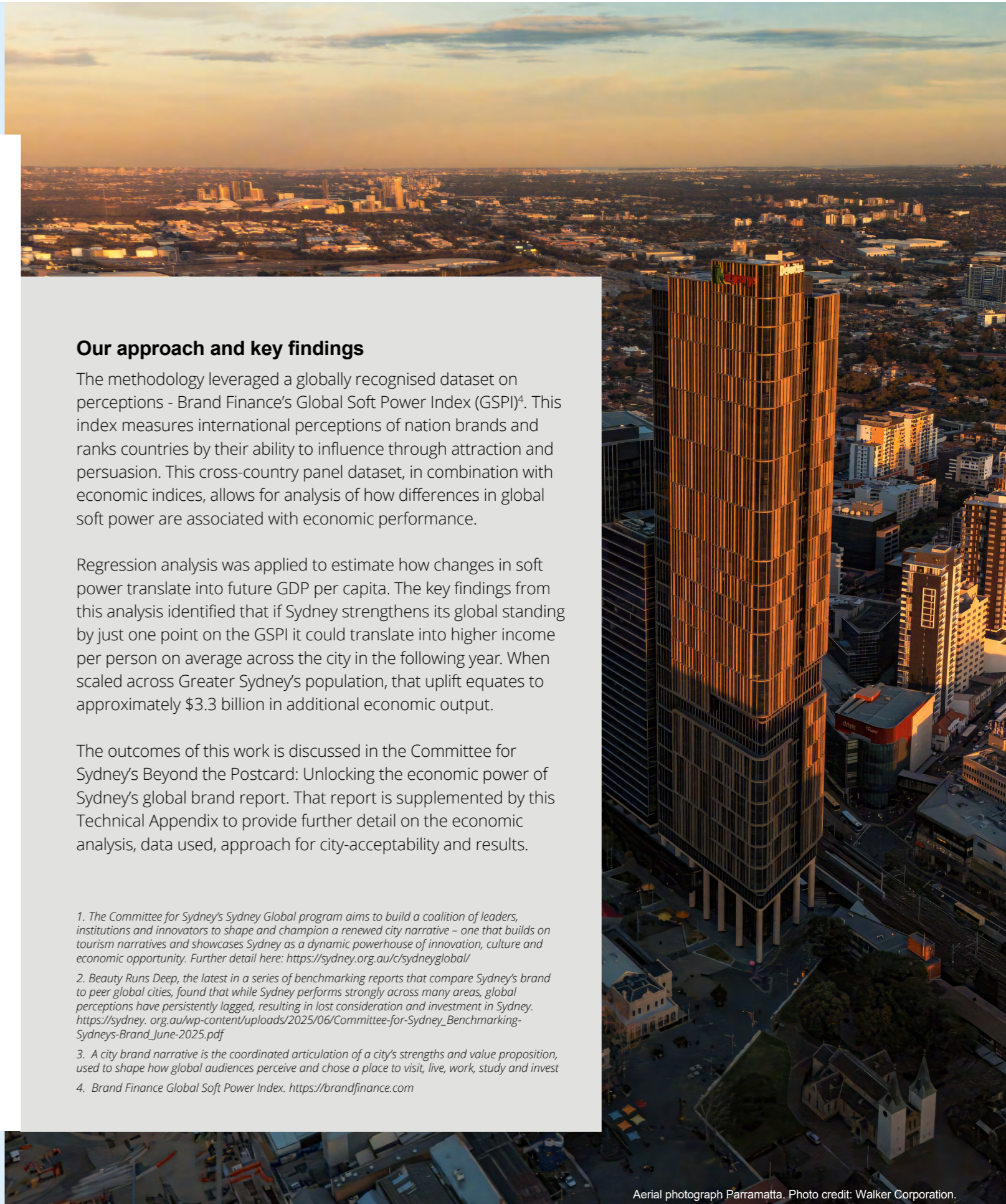
The outcomes of this work is discussed in the Committee for Sydney’s Beyond the Postcard: Unlocking the economic power of Sydney’s global brand report. That report is supplemented by this Technical Appendix to provide further detail on the economic analysis, data used, approach for city-acceptability and results.

1. The Committee for Sydney’s Sydney Global program aims to build a coalition of leaders, institutions and innovators to shape and champion a renewed city narrative – one that builds on tourism narratives and showcases Sydney as a dynamic powerhouse of innovation, culture and economic opportunity. Further detail here: <https://sydney.org.au/c/sydneyglobal/>

2. Beauty Runs Deep, the latest in a series of benchmarking reports that compare Sydney’s brand to peer global cities, found that while Sydney performs strongly across many areas, global perceptions have persistently lagged, resulting in lost consideration and investment in Sydney. https://sydney.org.au/wp-content/uploads/2025/06/Committee-for-Sydney_Benchmarking-Sydneys-Brand_June-2025.pdf

3. A city brand narrative is the coordinated articulation of a city’s strengths and value proposition, used to shape how global audiences perceive and chose a place to visit, live, work, study and invest

4. Brand Finance Global Soft Power Index. <https://brandfinance.com>



Aerial photograph Parramatta. Photo credit: Walker Corporation.

Approach and data inputs

An iterative approach was adopted to define the economic assessment framework and modelling approach.

Defining a modelling approach

To inform the identification of a modelling approach to quantify the gap between Sydney's global perception and its actual performance, a review of publicly available datasets and research was conducted. Through this research, the following options were developed and explored:

- **Soft power regression analysis:** Adopting a Soft Power Index (Brand Finance GSPI data) to conduct a fixed effects panel regression measuring impact of national brand index on GDP per capita.
- **Indicative computable general equilibrium (CGE) modelling:** Adopting desktop research and partner input to identify indicative shocks to economic outcomes relevant to the six pillars to understand impacts on the Sydney economy.

Through the literature and data review, and discussion with Committee for Sydney and Global Program Partners, it was identified that soft power regression analysis - particularly a fixed effects model - would be best suited.

This type of regression model is designed to isolate the relationship between variables - as it identifies how changes in one factor, such as Soft Power, are associated with changes in another, such as GDP per capita, over time.

Adopted soft power regression analysis approach

The preferred model was identified as a log-linear model with country and year fixed effects.

By using country fixed effects, we focus exclusively on "within-country" changes, meaning we control for a country's permanent characteristics to isolate the actual influence of its Soft Power on GDP per capita (as shown to the right).

Adopting country fixed effects approach controls for the tendency of certain countries to have systematically higher or lower GDP per capita than the model would predict because of factors that are not observed (or variables not included in the model). The use of year fixed effects accounts for global shocks to output over the modelling period.

Overview of the data used

The model combines data from Brand Finance's Global Soft Power Index with macroeconomic data from the World Bank. The Global Soft Power Index runs from 2020-2026, while the latest World Bank data for most countries is 2024.

To fit this within the regression framework, some countries did not have a long enough time series when combining World Bank to include in the model, and an additional year of data was lost due to the lagged GSPI term.

Given these factors, the dataset used in the regression analysis includes:

- 138 observations across 53 countries
- Median years of observations by country is three years

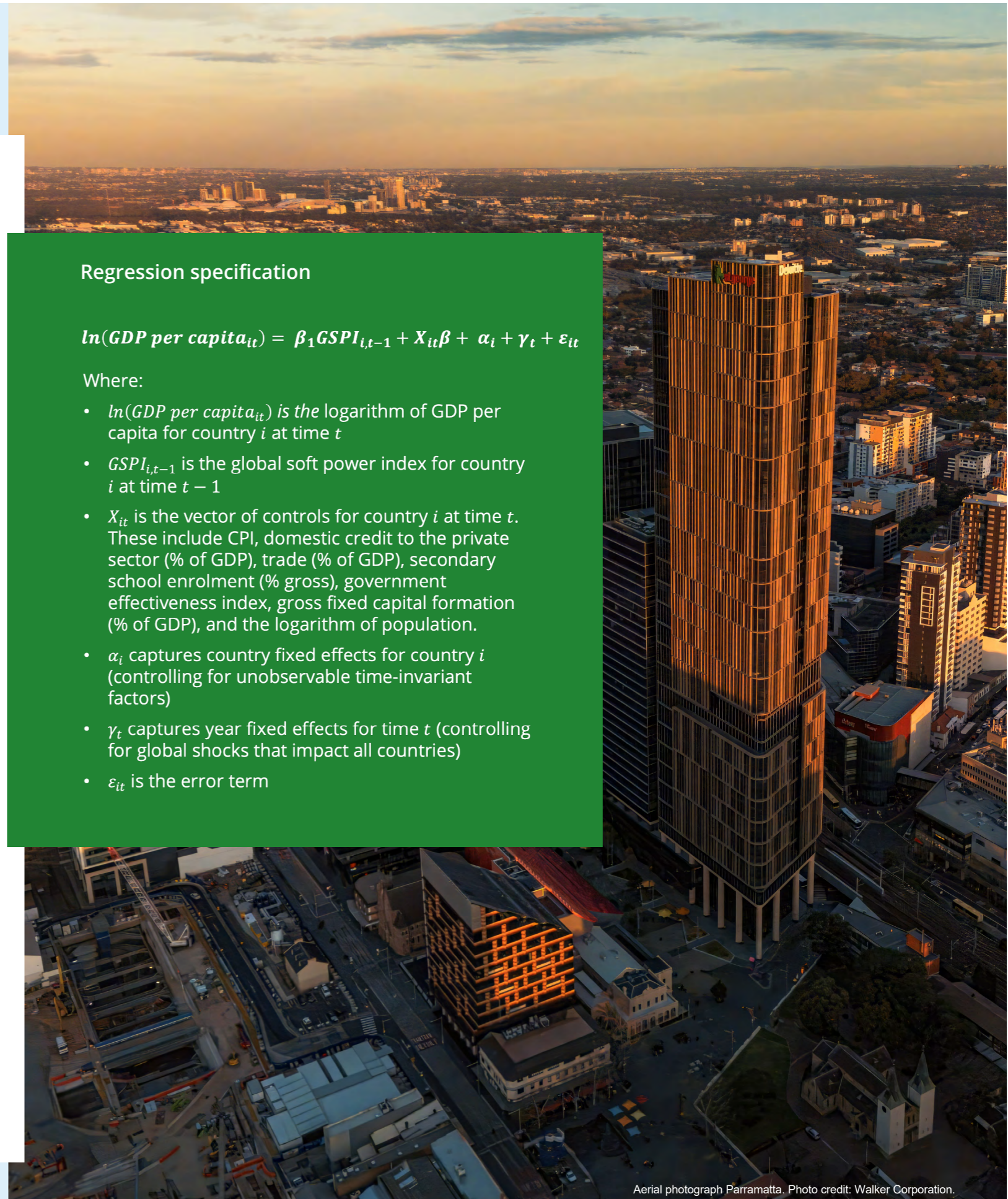
Most variables have a mean of four years of data available for each country in the GSPI dataset. However, there is on average only two years of data on secondary school enrollment. While its exclusion does not change the coefficient on the GSPI, its included in the final model due to its theoretical importance in controlling for human capital in the country.

Regression specification

$$\ln(\text{GDP per capita}_{it}) = \beta_1 \text{GSPI}_{i,t-1} + X_{it}\beta + \alpha_i + \gamma_t + \varepsilon_{it}$$

Where:

- $\ln(\text{GDP per capita}_{it})$ is the logarithm of GDP per capita for country i at time t
- $\text{GSPI}_{i,t-1}$ is the global soft power index for country i at time $t - 1$
- X_{it} is the vector of controls for country i at time t . These include CPI, domestic credit to the private sector (% of GDP), trade (% of GDP), secondary school enrolment (% gross), government effectiveness index, gross fixed capital formation (% of GDP), and the logarithm of population.
- α_i captures country fixed effects for country i (controlling for unobservable time-invariant factors)
- γ_t captures year fixed effects for time t (controlling for global shocks that impact all countries)
- ε_{it} is the error term



Aerial photograph Parramatta. Photo credit: Walker Corporation.

Regression Results

A one unit increase in GSPI is associated with a 0.6% increase in GDP per capita, resulting in aggregate uplift of approximately \$3.3 billion in GRP in the subsequent year.

Summary of key findings

The lagged fixed-effects panel regression allowed us to estimate how within-country changes in soft power perception over time relate to within-country changes in economic outcomes.

The regression analysis found that improvements in the Global Soft Power Index were significantly associated with increases GRP per capita in the subsequent year, holding other variables constant. Specifically:

- A one unit increase in GSPI is associated with a statistically significant **0.6% increase in GDP per capita** in the subsequent year. Where a 95% confidence interval places the estimate at 0.27% to 0.94%.
- A 0.6 per cent uplift equates to an increase of approximately \$575 per capita, based on Greater Sydney's Gross Regional Product per capita of approximately \$96,000 for FY24.¹
- Applied across the Greater Sydney population, this corresponds to an aggregate uplift of approximately \$3.3 billion in GRP in the following year.

Interpretation of the analysis

How to interpret the index and specification

The GSPI coefficient reflects how changes in GSPI are typically associated with changes in GDP per capita within countries over time. It represents an average global relationship, not a country-specific outcome.

How to interpret causality

The analysis controls for many confounding factors, but it does not prove a direct causal effect. The result should be treated as an indicative benchmark, rather than a precise causal estimate.

What is not captured

Longer-term impacts may differ as benefits fade or evolve over time.

1. ABS (2025), Economic profile | Greater Sydney | economy.id

Regression model results

The model implies that a one-unit increase in Sydney's GSPI will boost GRP per capita by 0.6 per cent in the following year, holding all other variables constant.

Within R-squared	
0.562	

Variable	Coefficient	Std. Error	t-statistic	P-value
GSPI	0.006	0.002	3.528	0.001
CPI	-0.001	0.001	-0.687	0.494
Gross Fixed Capital Formation (GGCF) % of GDP	-0.003	0.004	-0.749	0.456
Domestic credit % of GDP	-0.004	0.001	-4.016	0.000
Trade % of GDP	-0.007	0.001	-6.950	0.000
Secondary school enrollment %	0.002	0.002	1.389	0.169
Government Effectiveness	0.105	0.066	1.579	0.119
Logarithm of population	-0.954	0.659	-1.446	0.152

Other control variables in the model

The methodology leveraged a globally recognised dataset on pIt should be noted that not all of the control variables were found to be statistically significant. This is expected in a model with country fixed effects where identification is driven by deviations from country-specific and time-specific averages rather than cross-sectional or long-term differences.

For example, trade as % of GDP could be negative if imports surge during downturns, or GDP outcomes are driven by commodity price shocks. Similarly, the negative coefficient on population indicates that GDP (as opposed to GDP per capita) moves more or less in line with population.

Importantly, the coefficient on GSPI remains stable and statistically significant across alternative specifications, indicating that the estimated relationship is not driven by differences in specification or the inclusion of particular control variables.



Aerial photograph Parramatta. Photo credit: Walker Corporation.

Sensitivity Analysis

Sensitivity analysis was used to test whether the finding vary under different model specifications or in different groups of countries.

Summary of key findings

Sensitivity analysis indicated that the relationship between the GSPI and GDP per capita is stable amongst sub-samples of economies that are similar to Sydney. However, effect sizes were found to decline slightly in countries with higher average levels of human capital or higher dependency ratios.

A wide range of robustness checks were applied to test whether the size of the coefficient on GSPI varied across specifications. The coefficient remained stable on a range of tests in terms of direction and magnitude, including leave-one-out tests and forward selection algorithms. A one-point increase in lagged GSPI fell reasonably consistently within a range of a 0.5–0.7 percent increase in GDP per capita.

Diagnostic tests (F-test for time effects, Wooldridge and Breusch-Pagan) supported the use of country and year fixed effects with heteroskedasticity-robust standard errors clustered by country. A quadratic specification was also tested but found no significant non-linear relationship between soft power and GDP per capita.

Various tests were also run to ensure the application of a global elasticity to Sydney was reasonable, including running the model on sub-samples of economies with similar characteristics and exploring if the coefficient was significantly influenced by the interaction of other variables. The results of these latter tests are discussed in further detail to the right.

Fixed effects regression sub-sample sensitivity testing

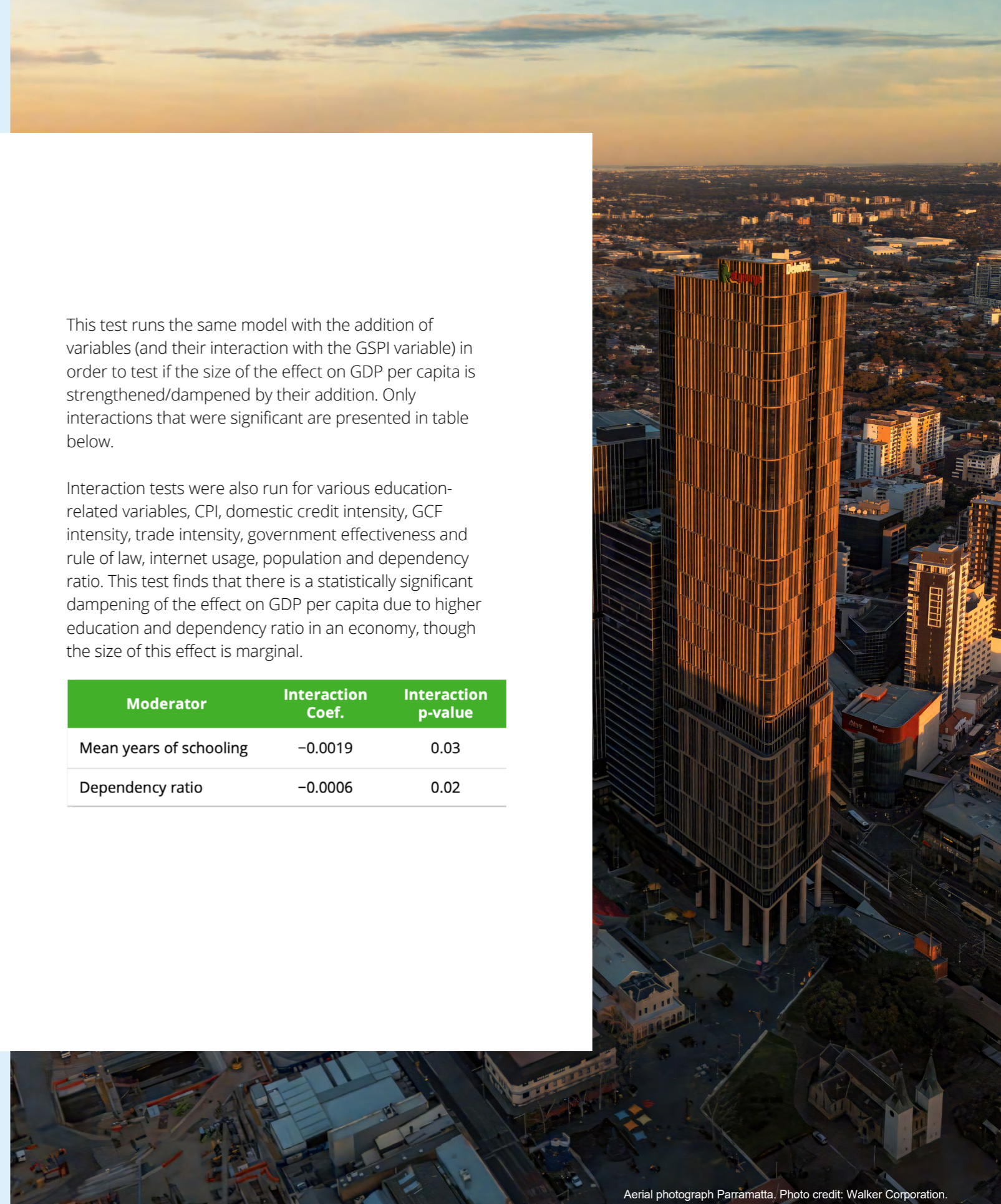
This test runs the same model but on a smaller sample of countries to assess whether analysis on a sample of countries which are similar to Sydney (across various characteristics) has a significant impact on the GSPI coefficient. This test found that the coefficient remained stable across various specifications. The effect was not significant when excluding brand superpowers although in a similar direction. This is unsurprising as some of the soft power effect is likely to come from countries with a strong brand.

Subsample	Countries	GSPI coef
High-income / advanced	48	0.007****
High rule of law (proxy)	48	0.007***
Services-oriented advanced	48	0.007***
Excluding brand superpowers	114	0.003

This test runs the same model with the addition of variables (and their interaction with the GSPI variable) in order to test if the size of the effect on GDP per capita is strengthened/dampened by their addition. Only interactions that were significant are presented in table below.

Interaction tests were also run for various education-related variables, CPI, domestic credit intensity, GCF intensity, trade intensity, government effectiveness and rule of law, internet usage, population and dependency ratio. This test finds that there is a statistically significant dampening of the effect on GDP per capita due to higher education and dependency ratio in an economy, though the size of this effect is marginal.

Moderator	Interaction Coef.	Interaction p-value
Mean years of schooling	-0.0019	0.03
Dependency ratio	-0.0006	0.02



Aerial photograph Parramatta. Photo credit: Walker Corporation.

Satisfying assumptions for city-level applicability

Sydney's local economic context will differ from the global / country-level mean, and as such GSPI impacts probably lie within a bounded range.

Sydney's effect could differ due to:

01 Brand Saturation Effects

Sydney has one of the strongest city-brands in the world, as indicated by the City Brand Index.

Marginal increases in brand strength are likely to generate diminishing marginal returns, consistent with the observed attenuation in "brand superpower" subsamples.

02 Human Capital Saturation

Sydney has high levels of human capital, which were shown to attenuate the returns to GSPI through interaction sensitivity testing.

This could be due to diminishing returns in high productivity environments.

03 Demographic Constraints

Higher dependency ratios also weaken returns according to interaction tests. This could be due to labour constraints or other factors that limit returns in ageing populations.

To the extent that demographic trends bind at the metropolitan level, this may further moderate the GSPI effect.

04 Sectoral Composition

Sydney's services-oriented economy may amplify certain brand channels (e.g. tourism, professional services) according to sub-sample tests.

The application of an average country level effect size to Sydney

The results of our sensitivity tests suggest that the coefficient is stable across similar economy specifications and doesn't significantly differ due to interaction effects with a number of economic and demographic variables (apart from small effects on secondary schooling and dependency ratio).

However, this finding is subject to two conditions (below), namely that Sydney behaves like a small open economy and that the economic channels that link soft power to GDP at a national level also operate for Sydney.

Conditions for city-level applicability of the country-level soft power indices and economic flows

Given data limitations, there is a need to justify applying the global GSPI elasticity to Sydney. Through analysis of Sydney's structural equivalence and mechanism transferability, the outcomes of the regression analysis allows us to state: "If cities (Sydney) respond similarly to branding as countries do, then a city-level improvement in branding could be associated with an increase in GDP per capita of approximately X%".

Condition 1: Structural Equivalence

Assume Sydney behaves like a **small open economy**, where reputation attracts investment, tourism, students, and talent in a proportional way to global economies. This assumption is explored further in the following page which examines Sydney's share of international trade flows.

Condition 2: Mechanism Transferability

The economic channels through which soft power raises GDP per capita at the national level must also operate meaningfully in **Sydney** (e.g. FDI, tourism etc.)

Evidence to support these is set out on the next page.

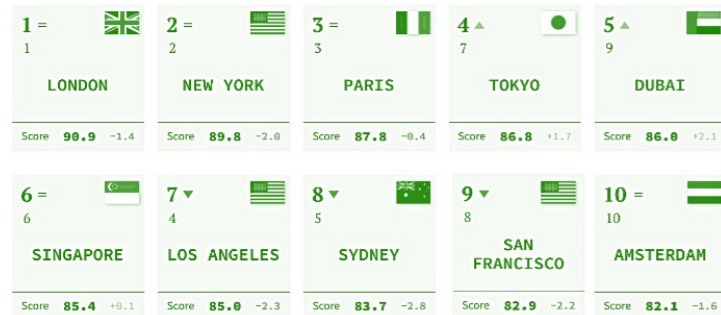
Evidence to support city-level applicability

Sydney represents a significant portion of Australia's international business, trade, tourism, migration and education flows which suggests it is likely to have similar brand dynamics to many countries – meeting the two conditions of city-level applicability, as evidenced below.

Soft Power

In 2024, Sydney had a Global City Index score of 83.7 with a rank of 8

- This is a 2.8 decrease from the year before
- A 3-point gain would bring Sydney into the top 5



Global City Index measures 45 attributes across 7 pillars of city brand perceptions.

The inclusion of these underlying city brand attributes offered further insights into the strengths and qualities of each city.



In 2024, Sydney ranked highly across the following attributes:

Reputation (#2)	People & Values (#4)	Friendly (#6)
Consideration (#7)	Fun (#9) ¹	

This strong ranking underscores Sydney's appeal as a vibrant and highly liveable global city. It also confirms Sydney's role as Australia's primary city-brand, suggesting that international perceptions of Australia are, in part, shaped by perceptions of Sydney itself.

Other Australian cities have been ranked:

- Melbourne scored 78.8 with a rank of 22
- Perth scored 62.1 with a rank of 71
- No other Australian cities rank in the top 100

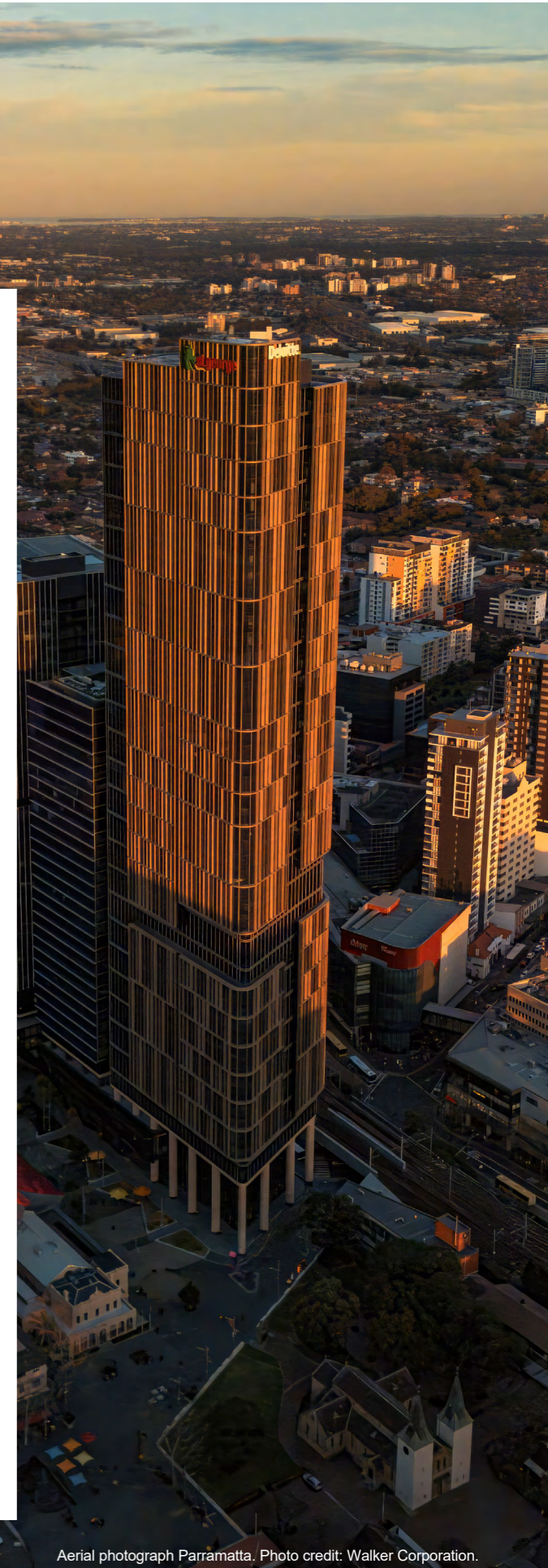


Economic Contribution

How does Sydney contribute to Australia from an economic perspective?

- **Business and trade:** Sydney is an important start up hub, receiving "65% of Australia's startup funding" in 2024.² NSW has 45% of Australia's international trade in services (credits) in FY25,³ and 17% of merchandise export FOB value in FY25 (rank 3rd).⁴ Port Botany, located in Sydney's south, is one of the country's largest container ports.
- **Culture and Heritage/People and Values:** Sydney had the highest international visitation (3.6m) and international tourism expenditure (\$12bn) in FY25 amongst all capital cities.⁵ Further, over the course of FY24 Greater Sydney had net overseas migration of 120,886 (28% of Australian net overseas migration).⁶ Sydney was the city with the second highest net overseas migration (only just eclipsed by Greater Melbourne).
- **Education and Science:** In 2024, there were over 175,000 international student enrolments in higher education facilities in Sydney (36% of total in Australia).⁷ Further, NSW was the largest destination for business R&D expenditure in FY24, totaling \$9.6bn (or 48% of Australia's total).⁸

1. BrandFinance (2024), 2. Startup Genome (2024), 3. ABS (2025), 4. ABS (2025), 5. Destination NSW (2025), 6. ABS (2025), 7. Department of Education (2025), 8. ABS (2025)
 *note: Brand Finance City Index was prepared for in 2023 and 2024, reporting research on the perception of city brands globally, adopting a similar framework as GSPI.



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