An Assessment of the Methodology and Findings of the

EY Report (2022) ‘The costs of abolishing the Australian Building and Construction Commission’

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Key Dot Points

* The 2022 EY report is one of a long chain of commissioned reports from employer and developer related groups to argue for a continuation of the ABCC or like entities. The Productivity Commission (2014: 543) inquiry into Public Infrastructure reviewed these studies and concluded ‘when scrutinised meticulously, the quantitative results provided by IE [Independent Economics, formerly Econtech] or others do not provide credible evidence that the BIT/ABCC regime created a resurgence in aggregate construction productivity or that the removal of the ABCC has had material aggregate effects. Indeed, the available data suggests that the regime did not have a large aggregate impact’. Further the Commission (2014: 773) makes the important point that ‘the use of unconvincing evidence of a large effect [of industrial relations changes] may undermine the credibility of proposals for IR policy change. It may also distract policymakers from other factors important for productivity in the construction industry — such as better procurement practices, innovation and diffusion of technologies’.
* The list of qualifications and exclusions regarding the analysis and use of the report stated at the beginning and throughout the report undermines its standing in attempting to influence public policy. There are two key disclaimers. First, the report represents solely the ‘interests’ of the MBA and so does not have regard to other evidence that contradicts these interests. Second, the modelled outcomes are contingent ‘on the collection of assumptions as agreed with the Client’. That is, the assumptions critical for modelling which, forms the core of the report, were determined by the MBA and not based on objective data or accepted economic theory.
* The report does not attempt to understand the role of unions; indeed, this role is explicitly excluded from the analysis (p.6). Nor does it seek to understand the current industrial relations system within the construction industry and the role of disputes. Disputes in the industry have been trending down consistently since the 1980s in line with the pattern in other industries. The EY report appears to regard all industrial action, both protected and unprotected, as illegitimate and simply a cost, and has no regard to the role of industrial disputes in raising safety standards, recovering unpaid wages, improving conditions and seeking a fair distribution of the surplus generated by both capital and labour. Nor does it discuss the critical role of wages in attracting labour into the industry which, as the report notes, is suffering current and prospective critical labour shortages.
* The fundamental claim of the report, that the ABCC had had a positive effect on productivity, is contradicted by the fact that according to the definitive source, the ABS National Accounts, output per hour worked in the construction industry over the 7 years immediately before and during the tenure of the ABCC (2015-2021) fell by 6.3%. Over the preceding 7 years 2008-2014) productivity increased by 25.6%.
* The study does not attempt to directly measure the effect of the ABCC on productivity or firm performance rather, it establishes a hypothetical case by first estimating how productivity could be affected by abolition of the ABCC and then applying these estimates in an economic model to determine the impact of this change on productivity and output in the macro-economy. To determine the effect of abolishing the ABCC EY surveyed 49 people engaged in the construction industry and asked them to estimate the effect of ‘industrial disputes’ on construction productivity and output. This methodology for data collection is utterly unacceptable – it is effectively anecdotal- empirically empty and useless as a basis for analysis and modelling. It is not based on a large random stratified sample and the term ‘industrial dispute’ was never defined (duration, type, numbers of people involved etc). Further, an analysis of the ’data’ in Table 1 *EY Respondents Assessment of the frequency of industrial activities at worksites*, reveals that nearly two-thirds of respondents reported they ‘never’ or ‘rarely’ experienced industrial action at their worksites implying they had no direct factual basis for making any assessment of the impact of industrial action.
* The results of all economic modelling depend critically on the underlying assumptions. The key parameters fed into the model were that that abolition of the ABCC would result in an increase in industrial disputation that would in turn increase total construction industry labour costs by 1.78% and decrease in labour productivity by 1.86%. Not only do these assumptions have no empirical basis they are also implausible and internally inconsistent. First, the EY report (p.30) argues that the increase in labour costs and fall in productivity would cause ‘a fall in demand for construction services which could cost the industry $5 billion in economic output immediately’. (EY assumes the ABCC is abolished in 2021 and the effect on output occurs in 2022). However, elsewhere the report notes that in recent years the construction industry has been subject to very high levels of cost increase for non-labour inputs (materials, machinery etc) in the order of 90%-120%. These non-labour inputs comprise around 60% of total production costs in the construction industry. Yet, the report also notes that despite this phenomenal level of cost inflation the industry is projecting extremely robust growth in output into 2025. Second, the report argues that these cost increases have resulted in a ‘profits squeeze’ which will cause the industry to contract. This logic is then used to argue abolition of the ABCC by causing a labour cost increase and productivity decrease will cause both construction output and GDP to fall in the future. ABS data actually shows gross profits (EDBITA/income) in the construction industry have been robust for more than a decade and actually increased over the last 2 years. Third, because labour costs represent such a small part of total costs in the construction industry on average (16.1%) a 1.78% increase in labour costs equates to just a 0.287% increase in total construction costs. (To put this in perspective this tiny percentage change is well within the ABS sampling relative standard errors for estimates of construction output. In simple terms, the EY estimated labour cost increase is a ‘rounding error’ and can have no plausible economic effects). Fourthly, the EY model also assumes a close relationship between productivity change and construction output and GDP- a fall in construction productivity leads to a fall in construction output. Abolition of the ABCC will reduce construction productivity by 1.86% and therefore construction output and GDP will fall. This assumption is contradicted by the fact that despite the ABS National Accounts showing a substantial decline in actual construction productivity during the term of the ABCC (2016-2021) both construction output and GDP growth have been generally robust over the same period. (This, of course, is not to say productivity is unimportant; it simply reflects complex dynamics). This assumption was also statistically tested using a longer time series data and the claim that construction productivity ‘drives’ construction output is not supported. Finally, the EY report appears not to understand the basic economic concepts that underpin the model’s results. For example, the report (Table 1) finds that abolition of the ABCC will by 2025 reduce GDP by $16.3bn and investment by $24.7b. However, it is not possible for the fall in investment to exceed the reduction in GDP since investment (or more correctly Gross Fixed Capital Expenditure) is one of four National Accounts categories of expenditure that sum to GDP. (These categories are private and public investment and consumption plus net exports). In simple terms the data in ‘do not add up’ and the table does not make sense.

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**Introduction**

The Australian Building and Construction Commission (ABCC) is an Australian Government agency established by the Building and Construction Industry (Improving Productivity) Act 2016. It commenced operations in December 2016. Its purpose is ‘Upholding the law and changing behaviour to make the building and construction industry fair, efficient and productive’ (ABCC Annual Report 2020-21: 9).

In 2021 Master Builders Australia commissioned Ernst and Young (EY) ‘to perform economic analysis to assess the cost impacts from abolishing the Australian Building and Construction Commission (ABCC)’. The report took 9 months to compile, commencing July 2021 and completed April 2022.

The principal argument of the EY report relate to the claimed negative impact on productivity in the construction industry arising from closure of the ABCC and the wider adverse flow on effects to the rest of the economy. Accordingly, this Assessment focuses primarily on this claim.

This Assessment begins by summarising the key findings of the EY report and data collection methods. Observations regarding the status of the report and its utility as a guide to public policy follow. Next is a critical assessment of the data used in the modelling and the results.

**Key Findings of the EY Report**

The chain of reasoning in arguing for the adverse effect of abolition of the ABCC can be summarised as follows:

* the Australian construction industry is subject to high levels of industrial action and a challenging industrial relations environment’ (EY 2022: 6).
* ‘the disproportionate levels of industrial action in the construction industry can aggravate existing risks and have major implications for workers, businesses and the broader economy’ (EY 2022: vi).
* ‘the ABCC forms a critical safeguard for industry efficiency and performance…it was broadly accepted that if the body was abolished, this would lead to increased industrial action with attendant impacts on cost overruns and project delays (EY 2022: vi)
* abolition of the ABCC ‘in the current operating environment, labour costs could increase by around 8.8%, coupled with a potential decline in productivity of around 9.3%’ (EY 2022: vi)
* ‘any adverse impacts on the industry are likely to spill over into broader economic performance, damaging productivity and constraining future growth’ (EY 2022: vi).

The EY General Equilibrium Model (EYGEM) is used to quantify the scale of direct effects on the construction industry and indirect effects on the wider economy (Table 1). These direct and indirect effects are derived by comparing a ‘baseline’ scenario of retaining the ABCC against the ‘counterfactual’ of its abolition (EY 2022: 40). On all variables measured the impact of the ABCC’s abolition is negative.

Table 1: The potential short- and long-term impacts of abolishing the ABCC Indicator

|  |  |  |
| --- | --- | --- |
|  | **2025** | **2030** |
| GDP ($) | -16.3 billion | -47.5 billion |
| Construction output ($) | -18.4 billion | -35.4 billion |
| Manufacturing output ($) | -4.8 billion | -13.1 billion |
| Services output ($) | -5.9 billion | -19.5 billion |
| Investment ($) | -24.7 billion | -45.6 billion |
| Employment (FT jobs) | -3,839 | -3,950 |

Source: EY 2022: 30

**Status of the EY Report**

As with other EY commissioned reports the document begins with a Notice outlining qualifications and disclaimers. The list of legal disclaimers is prodigious, and the general reader is left wondering about the status of the report and the reliance that may be placed upon its contents. Two disclaimers are particularly pertinent.

First, EY ‘prepared the Report for the benefit of the Client and has considered only the interests of the Client… Accordingly, Ernst & Young makes no representations as to the appropriateness, accuracy or completeness of the Report for any other party's purposes’ (EY 2002: i). Further, ‘the merits or justification behind unions in the building and construction industry, whether or not the building and construction industry benefits from unions or how they should function, has not been considered’ (EY 2022: 6). Although not stated in the report the MBA strongly opposes abolition of the ABCC (The Property Tribune 2021). This singular focus on the interests of the MBA is a concern since it explicitly excludes consideration of the interests of construction workers, non-MBA employers in the industry, developers, and private and public purchasers of construction industry products and services. It is illicit to assume the interests of the MBA necessarily align with these other groups. This explicit partiality is important to note given the report is presumably intended to influence government decision-making by making a case against abolition of the ABCC.

Second, an additional disclaimer records that the MBA determined, or at least influenced, the assumptions used in the economic modelling which produced the claimed adverse macro-economic effects from closure of the ABCC. ‘The modelled outcomes are contingent on the collection of assumptions as agreed with the Client’ (EY 2022: ii). Assumptions regarding the behaviour of economic agents are critical to determining the quantitative results of economic models and differing assumptions will generate widely differing quantitative results from these models (Brain 1986). There may be a case for a client with specialised knowledge of a particular industry or activity to assist a modeller with selecting appropriate assumptions, but it is desirable that these assumptions be detailed in any presentation of a model’s results.

The fact that the EY report explicitly serves solely the interests of the MBA and that it also exercised some unspecified control over the EY economic model’s assumptions call into question the standing of the report’s findings given its apparently intended role in influencing public policy.

**ABS data refutes the EY Findings**

The fundamental assertion and finding of the EY report is that the ABCC has had a positive effect on aggregate construction industry productivity and that, conversely, its abolition will lower productivity, increase costs and lower construction output and adversely affected GDP. This claim is not consistent with ABS National Accounts labour productivity statistics. Over the 7 years immediately before and during the tenure of the ABCC, 2015-2021, productivity fell by 6.3%. Over the preceding 7 years, 2008-2014, productivity increased by 25.6%.[[1]](#footnote-1)

Table 2: Construction. Gross Value Added per hour worked.

Index Numbers. Original. Gross Output Index. 2020 Base = 100

|  |  |  |
| --- | --- | --- |
| June | Productivity Index\* | Construction Gross Output Index\*\* |
| 2008 | 93.0 | 77.26 |
| 2009 | 94.8 | 79.28 |
| 2010 | 97.8 | 82.14 |
| 2011 | 96.0 | 86.3 |
| 2012 | 105.8 | 93.37 |
| 2013 | 111.5 | 97.75 |
| 2014 | 116.8 | 99.79 |
| 2015 | 108.4 | 98.83 |
| 2016 | 104.0 | 98.48 |
| 2017 | 103.3 | 95.64 |
| 2018 | 104.9 | 104.47 |
| 2019 | 100.4 | 103.96 |
| 2020 | 100.0 | 100.0 |
| 2021 | 101.9 |  |

Source: \*ABS (2021) *Australian System of National Accounts 2020-2*1: Table 15. Cat No. 5204.0

\*\*ABS (2021) *Estimates of Industry Multifactor Productivity, Australia*: Table 16 Cat No. 5260.0

Table 2 also permits us to test a basic hypothesis underlying the EY analysis, that a change in productivity in the construction causes a change in construction output. Thus, the EYGEM model assumes that a fall in construction productivity of 1.86% (combined with a rise in labour costs) following abolition of the ABCC will result in an ‘immediate’ reduction in construction output. This assumption that output is driven, at least in part, by an exogeneous change on productivity, was tested by calculating the R-squared statistic which represents the percentage of variation in the dependant variable (output) is explained by variation in the independent variable (productivity). The R-squared statistic is just 0.47 implying that over half of the percentage variation in construction output is explained by factors other than variation in productivity. The R-squared relationship is weak and therefore does not support the EY hypothesis underlying their analysis. A more plausible explanation of the trends in table 2 is that construction productivity rises with construction output, especially emerging from a period of low demand as capacity utilisation rises. However, as capacity utilisation is reached productivity is likely to slow or decline.

**The Data Sources for Modelling**

The EY modelling was a two-stage process. The first stage was quantifying ‘the impacts of workplace relations matters and the ABCC on businesses, workforces and project sites, and the expected impact if there was a change to the functions of the ABCC’ (EY 2022: 6). The second stage was using these estimates of direct impacts on the construction industry of ABCC closure in the EYGEM model to quantify their impact on all other industries. These direct and indirect effects are derived by comparing a ‘baseline’ scenario of retaining the ABCC against the ‘counterfactual’ of its abolition (EY 2022: 40). (In such models typically the final results are the sum of direct effects and indirect effects where the latter are derived from a combination of input-output linkages and assumptions regarding parameters such as rates of capital-labour substitution and price elasticities of demand for intermediate and final commodities).

Data for the first stage was derived from an Industry Survey of ‘personnel that are involved in managing business operations, interactions between the business and the ABCC, and managers of workplace relations’ (EY 2022: 29). The survey was completed between November 2021 and March 2022. The key results of the survey were that abolishing the ABCC could increase construction labour costs by 8.8% and a decrease in productivity of 9.3% (EY 2022: 26). These direct impact estimates apply to the whole construction industry but as only ‘around 20% of the construction industry’s future pipeline is covered by the ABCC’s mandate. Direct impacts…were translated into an industry-wide impact of approximately an increase in labour costs of 1.78% [and] a decrease in labour productivity of 1.86%’ (EY 2022: 29). (In other words, to be able to model the effect on those parts of the construction industry covered by the ABCC the original survey estimates which applied to the whole construction industry, were discounted by a factor of .8).

The Industry Survey received 49 responses. The report correctly observes that for a number of reasons this data ‘is not intended to provide a statistically robust assessment of stakeholders’ views’ (EY 2022: 6). This is because the survey does not meet the minimum conditions for statistical robustness. First, the survey response size is small. Second, no indication is given of the size of the population from which the sample is drawn and how representative the sample is of this population. Third, no indication is given of the survey response rate, that is, what proportion of those surveyed actually responded to the survey and how the characteristics of those who responded differed from those who did not. Without meeting these minimum conditions no confidence can be placed on the validity or reliability of the data and no inferences can be drawn to the population from which it was drawn. In simple terms, data from Industry Survey cannot be taken to represent the views of industry and is equivalent to ‘anecdotal evidence’. It is also worth noting that survey respondents were not representative of the construction industry workforce as ‘respondents are likely in business management and operations roles or workplace and industrial relations management roles. Employees of construction companies were not covered by this survey’ (EY 2022: 20).

Given these limitations and the admitted absence of any statistical ‘power’ in the survey it is illicit to claim, as the report does, that the Industry Survey provides ‘a sound basis for this report’ in terms of the survey data informing the subsequent economic modelling exercise.

The report seeks to bolster the veracity of the Industry Survey by claiming it is ‘broadly consistent with previous studies and surveys undertaken on this issue and provide a sound basis for this report’ (EY 2022: 6). Amongst others it cites earlier surveys by the Australian Constructors Association (2007) and MBA (2008). These surveys arguably suffer from similar deficiencies in terms of lacking statistical power. For example, ‘more than 40% of respondents’ to the 2008 MBA survey were ‘unfamiliar with the work of the ABCC’ and the degree of familiarity of the remaining respondents is not stated but apparently the attitudes of both groups were included in the results (EY 2022: 18).

It is important to note the report also relies on a 2014 Productivity Commission study into Public Infrastructure as apparently lending its authority to the veracity of its own and other surveys such as those cited above. This is simply not the case. ‘The Commission has carefully reviewed the studies and the empirical evidence on aggregate productivity… when scrutinised meticulously, the quantitative results provided by IE [Independent Economics] or others do not provide credible evidence that the BIT/ABCC regime created a resurgence in aggregate construction productivity or that the removal of the ABCC has had material aggregate effects. Indeed, the available data suggests that the regime did not have a large aggregate impact’ (Productivity Commission 2014: 543).

There are other reasons for questioning the validity of the Industry Survey. The survey covered the ‘experience of the respondent with IR over the last four years’ (from 2018-2021) (EY 2022: 19). One survey question required respondents to consider 12 types of industrial action and to nominate the frequency with which each type occurred on their sites over the previous four years. There were a total of 404 responses. (Not all questions were answered by all 49 respondents). The aggregate results are interesting (Table 3). Nearly one-third (32%) of respondents had ‘never’ experienced industrial action over the last 4 years, while for a similar proportion (31%) this happened ‘rarely’. Another 22% recorded their sites experienced industrial action ‘once or twice a project’. It should be noted that some projects, especially those larger infrastructure projects typically covered by the ABCC, can take years to complete. In all 88% of respondents had none or at best very limited experience of industrial action over the reference period. This data calls into question the actual level of experience and knowledge base the Industry Survey respondents have in quantifying the impact of industrial action on productivity and output.

Table 3 EY Respondents Assessment of the frequency of industrial activities at worksites

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Never | Rarely | Sometimes - once or twice a project | Often - multiple times on a project | Very often - frequent occurrence on a project |
| Total no. of responses | 128 | 124 | 88 | 43 | 21 |
| % of total responses | 32% | 31% | 22% | 11% | 5% |

Derived from EY 2022: Table 3

In sum, the Industry Survey and other information used to derive output and productivity effects of industrial disputes and the impact of the ABCC in the EY report are not statistically valid and therefore are not suitable as inputs for estimating either direct effects on the construction industry or the wider economy.

One can only agree with the Productivity Commission’s assessment that industrial disputes can impose costs and can have local productivity effects but equally the impact of any particular industrial relations arrangements governing an industry are in reality a second or third order issue in the panoply of the more important factors impinging output and productivity within the construction industry. To cite the Commission again:

To place some perspective on the apparent economic implications of industrial disputes, in 2012-13, they reduced time worked by employees in the construction industry by around 0.032 per cent or about 40 minutes per employee per year. *This is a fraction of unscheduled absenteeism due to sickness each year*. (PC 2014: 535, *italics added*)

Finally, the Productivity Commission (2014: 773) makes the crucial point that:

‘the use of unconvincing evidence of a large effect [of Industrial relations changes] may undermine the credibility of proposals for IR policy change. It may also distract policymakers from other factors important for productivity in the construction industry — such as better procurement practices, innovation and diffusion of technologies’. [And, occupational health and safety].

**Internal Inconsistencies in Evidence**

Using the Industry Survey parameters of a construction wide increase in labour costs of 1.78% and a decrease in labour productivity of 1.86% following abolition of the ABCC the EYGEM model found that these ‘direct impacts cause a reduction in construction industry output as projects become more expensive and riskier, creating a fall in demand for construction services which could cost the industry $5 billion in economic output immediately, and $35.4 billion cumulatively by 2030. The immediate reduction in construction industry activity is likely to be sharp’ (EY 2022: 30). By ‘immediate’ the EYGEM model means within 12 months, as it is assumed the ABCC was abolished in 2021 and the largest reduction in construction output, investment and employment as well as GDP occurred in 2022, with a gradual recovery in all measures to 2030.

The claims that an increase in construction cost of production automatically leads first, to an ‘immediate’ reduction in construction output and second, that this will be a large reduction in output, are implausible and contradicted by other data in the EY report. The report devotes considerable space to a description of current conditions in the construction industry which, it observes, is characterised by both a very large rise in non-labour input costs *and* extremely vigorous growth. As to the first it notes that over the medium term ‘growth of demand for materials, equipment and plant could increase by over 120% each, increasing input prices. Prices for timber and steel have increased by 90%’. Further ‘demand for labour is predicted to be almost 50% higher than supply’ (EY 2022: 9). Despite this rapid rise in input costs Infrastructure Australia (2021) is cited as anticipating extremely vigorous expansion in construction output with ‘projections of 33% average annual growth’ (EY 2022: 11). This data is not consistent with the claim that a rise in input costs is associated with an ‘immediate’ and large decline in construction output.

The EY data on non-labour cost inflation also raises an obvious question; why is the MBA so exercised about the ABCC when apparently the principal ‘threat’ facing its membership is rising non-labour intermediate input costs? ABS data reveals that these non-labour inputs, such as equipment, steel, timber and concrete comprise around 60% of total costs in the industry (ABS 2020. Australian National Accounts: Input-Output Table 2019-20: Table 5 Cat. no. 5209.0). (Even accepting the argument that abolition of the ABCC increases wage costs by 1.78%, as explained below this will only raise total construction costs by just 0.287%- the equivalent of a statistical ‘rounding error’).

The report explains the purported negative association between input costs and output through a variety of mechanisms but the main one appears to be the adverse effect of rising input costs on construction industry profitability. ‘Falling levels of profitability are being driven by increasing project timelines, risk allocation, cost of inputs and capability constraints’ (EY 2022: 14). Within a General Equilibrium framework such as that used in EYGEM model a reduction in profitability would constrain construction output since the construction industry would in effect be ‘out competed’ by other industries in attracting productive resources. However, ABS data over the 11 years to 2020-21 shows no trend decline in the construction industry rate of profit, despite non-labour input prices rising substantially over the period (Table 4). In other words, a fundamental premise of the EY report, that input costs lead to a reduction in construction output is not supported by the data. (The reasons for this can reflect risk management practices by builders in their negotiations with developers and pricing power by builders allowing them to pass price increases onto to customers).

Table 4 Construction industry earnings before interest tax depreciation and amortisation (EDBITA) as a percent of Total Income

|  |  |
| --- | --- |
|  | EDBITA as % of Total Income |
| 2010-11 | 11.4% |
| 2011-12 | 10.9% |
| 2012-13 | 10.4% |
| 2013-14 | 10.1% |
| 2014-15 | 11.0% |
| 2015-16 | 11.1% |
| 2016-17 | 11.0% |
| 2017-18 | 10.7% |
| 2018-19 | 11.2% |
| 2019-20 | 12.2% |
| 2020-21 | 12.9% |

Source: Derived from ABS Australian Industry, 2020-21: Table 1

**The projected scale of labour price rises are vanishingly small**

It is important to put the scale and impact of a projected 1.78% increase in wage costs in perspective. First, employee wage costs as a proportion of total costs vary considerably across the main segments of the industry but comprise only 16.1% of total construction costs (Table 5). It follows that a 1.78% increase in construction wage costs will increase total costs in the construction industry by just 0.287%.

Table 5 Employee wage cost as a percent of total construction costs 2019-20. Australia

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Residential | Non-residential building construction | Heavy and civil engineering construction | Construction services | Total Construction |
| 11% | 21% | 18% | 32% | 16.1 |

Source Derived from ABS 2020. Australian National Accounts: Input-Output Table 2019-20: Table 5 Cat. no. 5209.0

Table 6 Effect of a 1.78% increase in employee costs on total construction industry costs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Residential | Non-residential building construction | Heavy and civil engineering construction | Construction services | Total Construction |
| 0.196% | 0.374% | 0.320% | 0.570% | 0.287% |

Derived from ABS 2020. Australian National Accounts: Input-Output Table 2019-20: Table 5 Cat. no. 5209.0 from ABS 2020. Australian National Accounts: Input-Output Table 2019-20: Table 5 Cat. no. 5209.0ABS 2020: Table 5

To put this in perspective this tiny percentage change is well within the ABS sampling relative standard errors for estimates of construction output. (In simple terms total industry costs are equivalent to total industry output).[[2]](#footnote-2) Expressed differently, the EY estimated labour cost increase is a ‘rounding error’ and can have no plausible economic effects.

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1. Labour productivity is an intuitively obvious and robust measure of long-run productivity that requires few assumptions or data manipulation to derive. Alternative measures such as multi-factor productivity (MFP) growth show different results but are also highly controversial as they employ an economic theory which purports to measure the productivity of both capital and labour, or the contribution of each separate factor to total industry output. In reality, the results are simply an accounting identity or tautology derived directly from empirical measures of factor income shares and are not independently estimated (See Felipe and McCombie (2019) for a theoretical critique and Mark (1986) for some empirical problems with MFP). [↑](#footnote-ref-1)
2. Because the ABS estimates of construction output, employment and investment etc are all sample survey based they are subject to various types of sampling and non-sampling errors. The concept of standard error of estimate (SE) is used to quantify how much the estimate might have varied by chance. There are about two chances in three that a sample estimate differs by less than one standard error from the number that would have been obtained if all construction activity had been included and there was no random adjustment. There are about 19 chances in 20 that the difference is less than two standard errors. A related and generally more easily understandable measure of variation in the estimate caused by chance is the relative standard error (RSE), which is obtained by expressing the standard error as a percentage of the estimate. The RSE of construction output differs across sub-industries. For example, the March quarter 2022 RSE’s for Non-Residential and Engineering output were1.4% and 0.7% respectively (Building Activity, Australia, Mar 2022 Cat. No. 8752.0 and Engineering Construction Activity, Australia, March 2022 Cat. No. 8762.0). This means there is 68% chance the true Engineering output measure lies +-.7% of the sample estimate.

   [↑](#footnote-ref-2)