SENATE SELECT COMMITTEE ON SCHOOL FUNDING

ANSWERS TO QUESTIONS ON NOTICE

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This document addresses the five related matters taken on notice during my evidence to the Senate Select Committee on School Funding on 16 May 2014.

In large part these matters relate to the submission from Professor Henry Ergas and his subsequent evidence, together with broader issues relating to loadings for aggregated social disadvantage, and to economic modeling.

In preparing this response, I have been advised by a number of colleagues in education, to whom I extend my thanks.

1. The impact of funding on outcomes

Prof. Ergas argues that "there is no evidence whatsoever" that an increase in expenditure on schooling will improve school performance. He cites two sources in support of this conclusion: reviews by Grubb (2011) and by Hanushek and Woessman (2010).

Neither source really supports his case.

Grubb (2011) is an important publication, which Prof. Ergas has not represented accurately. Its thrust is to show that school outcomes depend very much on how school resources are used. Grubb sees money as an essential but not sufficient condition for school improvement: his major contention is that funding is an essential element in the creation of "compound resources", in which money and other resources are combined to improve school outcomes. In the Australian context, examples of compound resources might include the application of funds in disadvantaged schools to support whole-school instructional leadership, teachers' aides, counselors, intervention programs and home/school liaison personnel fluent in the dominant community language.

The essence of Grubb's argument is set out in the following paragraph:

"Of course, these conclusions do not mean that money doesn't matter, or that it would not matter much more under the right incentives and conditions at the school level. Increasing spending does enhance simple resources, as well as compound resources with identifiable costs like counselors and professional development, and very often complex and abstract school resources require

small amounts of additional funding. The conclusion that money doesn't matter is not correct, and fiscal conservatives and opponents of funding equalization should not take comfort from the complexities of an improved approach to school resources. But money by itself is not enough to ensure greater effectiveness." (Grubb 2011, p 88)

Hanushek and Woessman (2010) is a review of between-country studies. Such cross-country analyses inevitably suffer from particular problems relating to variables omitted from one study but included in another; they are also limited because they do not comprehensively show on a comparative basis how funding is spent in different countries. As a result some studies show positive results, and others no effect or negative impacts. Further, as Hattie (2009) notes, the variation in spending between developed countries is not all that large, and this may be one reason for little effect shown in several cross-country studies. There is no way however in which Hanushek and Woessman (2010) can be construed to prove the case that "there is no evidence whatsoever" that an increase in expenditure on schooling will improve school performance.

Prof. Ergas notes that the literature examining the relationship between school funding and student outcomes is extensive, but he is wrong in asserting that 'most often, no link is found'. He ignores the meta-analyses of published research that either controlled for socioeconomic characteristics or was longitudinal in design (Greenwald et al, 1996). The conclusion from that work was that 'a broad range of resources were positively related to student outcomes, with effect sizes large enough to suggest that moderate increases in spending may be associated with significant increases in achievement'.

He similarly ignores the extensive body of research findings that confirms the positive impact of funding on student achievement, including Verstegen (1998), Lee and Barro (2001), Hattie (2009), Baker (2012), Gibbons and McNally (2013) and Hyman (2014).

Nor does Prof. Ergas refer to the compelling body of evidence on the positive relationship between funding and outcomes specifically for disadvantaged students, reported in internationally prominent research papers such as Jacob and Ludwig (2008), Henry et al (2010), Holmlund et al (2010), Gibbons et al (2011), Ooghe (2011), Roy (2011) and the various analyses from the OECD in 2010 and 2013.

Given these shortcomings, Prof. Ergas has failed to survey adequately what he describes as the "enormous literature in the economics of education that examines the relationship between school funding and student outcomes". His conclusion that "most often, no link is found" is wrong.

1.1 USA

The most recent research on the relationship between school funding and educational outcomes is by Jackson et al (2014), published in May this year

by the US National Bureau of Economic Research. This new study shows that school finance reform in many states of the USA has increased expenditure in low income school districts, leading to improved school and later adult attainments of low income children.

A range of school finance reforms (SFRs) were introduced in many US states between 1967 and 2005, resulting in significant changes to school funding formulae. By 2005, most states had some form of SFR: 23 states had at least one court-ordered reform, 32 states had at least one legislative reform, and 45 had some change in the school funding formula.

The study found that SFRs were instrumental in equalizing school spending between low and high income districts and many reforms did so by increasing spending in poor districts.

The court-ordered reforms reduced the spending gap between the lowest and highest income districts by about 70 per cent, mainly by increasing expenditure in low income districts. The impact of legislative reforms was less, reducing the gap by 27 per cent. The legislated changes tended to re-distribute funding from higher to lower income districts rather than increase overall expenditure.

The impact of these reforms on the school outcomes of low income children was significant. Cohorts of students from poor families exposed to the reforms had higher high school graduation rates than the pre-reform cohorts, and districts that experienced larger spending increases had better high school graduation rates than those with smaller spending increases for the exposed cohorts.

The study estimated the effects of these reform-induced changes in per-student spending on years spent in school, and on the probability of graduating from high school. It found that a 20 per cent increase in per-student spending each year for all 12 years of public schooling for children from poor families leads to about 0.93 more years of schooling. This would almost eliminate the gap of 1.01 years between these students and those from non-poor families. It would also increase the high school graduation rate for those children by between 11 and 46 per cent, which is large enough to eliminate completely the high school graduation gap between children for poor and non-poor families.

The relationship was apparent only for children from poor families. The study found little or no effects of increased school spending on school outcomes for children from non-poor families or on their adult earnings.

The study also attempted to identify separately the pathways through which various types of K-12 education spending and the composition of school expenditures impact on school outcomes and subsequent adult attainments. It examined the impacts of SFRs on instructional spending, school support services, physical capital and school building expenditures and found that they led to increases in all categories of spending. The increases were roughly proportional to the allocation of funds on average, indicating that

schools simply increased spending in all categories with little change in the allocation of funds across categories.

How did they spend the funds? The study found that districts with a 20 per cent increase in funds reduced school size, reduced the number of students per teacher, reduced the number of students per counsellor, and reduced the number of students per administrator. It said that while there may be other mechanisms through which increased school spending may improve student outcomes, the results suggest that the positive effects are driven, at least in part, by reductions in class size and having more adults per student in schools.

The authors said that their results bear upon the much debated issue of whether money matters in education, and conclusively show that money does matter for disadvantaged students: “These results provide compelling evidence that the SFRs of the 1970s through 2000s had important effects on the distribution of school spending and the subsequent socioeconomic wellbeing of affected students. Importantly, the results also speak to the broader question of whether money matters..... many have questioned whether increased school spending can really help improve the educational and lifetime outcomes of children from disadvantaged backgrounds. The results in this paper suggest that it can.” (Jackson et al, 2014)

1.2 Finland

Footnote 2 in the Ergas submission notes that the ‘strong performance of the Finnish system occurred in the contest of significant falls in educational expenditure’. This relates a point-in-time measure of performance with a measure of change in expenditure. It is more appropriate to look at the association between two measures of change. One would not expect effects of changes in expenditure to be immediate, because PISA is measured at 15-years of age and represents the accumulation of learning over the preceding period of schooling. Hence, one should look for lagged effects of changes in expenditure.

The fact is that the results from Finland in PISA have shown a decline in mathematical literacy from 2003 to 2012 (by 26 points or one quarter of a standard deviation) (OECDa, 2013: 306) and a decline in reading literacy from 2000 to 2012 (by 22 points or one-fifth of a standard deviation) (OECDa, 2013: 383). In both cases the declines became evident in 2009 or 2012 data. Those trends are consistent with an impact of reduced funding on declining performance.

1.3 OECD

The OECD report on the 2012 PISA results (2013c) shows that the extent and quality of human and material resources in secondary schools is a major influence on student achievement. It found that “high-performing countries tend to allocate resources more equitably across socio-economically advantaged and disadvantaged schools”.

Australia does not have a good record in allocating school funding equitably. The OECD (2013b,c) shows that disadvantaged schools in Australia have far fewer educational resources than advantaged schools. They experience more teacher shortages, and more shortages or inadequacy of educational materials and physical infrastructure than advantaged schools.

The gaps in human and material resources between disadvantaged and advantaged secondary schools in Australia are amongst the largest of all the countries participating in PISA, and certainly amongst the higher performing countries. Out of 65 nations participating in PISA, only Taiwan has a greater differential between advantaged and disadvantaged schools in the supply of teachers. Only ten countries have greater inequity than Australia in the allocation of educational resources.

2. Changes in educational expenditure in Australia

Prof. Ergas's submission references 'real growth in government expenditure of over 3.8 percent per annum over the period 2000-2012' and contrasts this to a lack of improvement (or decline) in international tests over the same period. He does not acknowledge the fact that the increase in expenditure has not been even over all areas, sectors or stages of schooling.

The claim of real growth in government funding of over 3.8 per cent per year for 2000-2012 has been questioned by Cobbold (2014), who believes it is significantly over-estimated for several reasons. First, it includes book-entry (user cost of capital and depreciation) and other items (payroll tax and school transport) in government school funding which have increased significantly but have no impact on school outcomes. These items accounted for 35 per cent of the increase in nominal expenditure over the period.

It also fails to take account of changes in the composition of enrolments. The most costly groups of students (Indigenous students, students with disabilities and Year 11 and 12 students) have increased as a proportion of all students from 19.4 to 23.6 per cent, with a larger increase in government schools than non-government schools.

Further, the Ergas estimate is for total government funding growth, not per student growth, and the GDP deflation is used to adjust for rising costs. School enrolments increased over the period, boosting government funding. The wage price index for education and training is a better measure of rising costs in the education sector, because the GDP deflator reflects productivity increases in the rest of the economy that are not available in education. (This was recognised by the recent Commission of Audit Report, which advised indexation by a composite index weighted by education wage prices and CPI.) Consequently, the Ergas figure underestimates cost increases and overestimates the real increase in funding.

Cobbold (2014) has estimated growth in real government funding per student (government and non-government) over 1999-2000 to 2011-12 at 1.3 per cent

per year, with higher growth for non-government schools than for government schools. This is below the average rate of per capita economic growth over the last decade (about 1.5 per cent per year).

White (2013) reviewed school funding trends in Australia from 1972-3 to 2006-7. He noted that average per student recurrent funding (in constant price terms and encompassing both state and Commonwealth sources) for Australian schools increased by a greater annual percentage in non-government schools (4.0 per cent) than government schools (2.2 per cent). This difference would be compounded in aggregate figures by the greater increase in enrolment share held by non-government schools as well as a shift in the socioeconomic composition of government schools (Lamb, 2007).

My view is that far too much of the increased funding during the period 2000-12 has not been targeted strategically at areas of need, and has been spent on schools and for purposes which are not a high priority nationally. Much could be achieved by redistributing available funding according to need. It is not a logical requirement of sector-blind needs-based funding that no school should lose a dollar.

Where it has been possible for schools and systems to target funding against areas of need, there has been real improvement. The strategic targeting of available resources on reading in the early and primary years has clearly resulted in improved achievement: as a result, over the period 2008 to 2013 there has been an improvement in reading in Year 3 and Year 5 (ACARA, 2013: 300), including notable improvement amongst Indigenous students.

Similarly, there has been a significant increase in the TIMSS results for Year 4 mathematics, in my view arising from the strategic targeting of resources on numeracy in the early years of schooling.

3. The relationship between socioeconomic status and achievement

The Ergas submission argues that ‘parental socioeconomic status has a relatively minor effect on school outcomes, explaining a small share (in the order of 4 to 9 percent or possibly less) of the variation in outcomes’.

As with his coverage of the literature on funding and outcomes, Prof. Ergas ignores a very substantial corpus of research that clearly shows a strong relationship between socioeconomic status and student achievement. Seminally important papers such as Sirin (2005), OECD (2010a) and Reardon (2011) are not even considered. The jury is in on this issue: the evidence is overwhelming.

Perhaps of greater concern is the representation by Prof. Ergas of the limited evidence he supplies.

First, the paper by Bjorklund and Salvanes (2010) is cited by Prof. Ergas as among the “best evidence” to show that parental socioeconomic status has a

relatively minor effect on school outcomes. This paper in fact demonstrates very strong links between family background (a complex of variables, of which socioeconomic status is a central element) and student results across many countries. The reference in the paper to an Australian study shows just as strong a relationship as in many other countries. Why is that conclusion not made apparent?

Second, earlier in his submission Prof. Ergas cites Hanushek and Woessman (2010) in support of his claim about the relationship between funding and student outcomes. Yet, when he turns to the question of socioeconomic status and achievement he ignores this paper, which reports a very strong relationship between family background and student outcomes.

Further, Prof. Ergas claims that the Luxembourg Income Study demonstrates only a weak link between socioeconomic status and educational outcomes. His source is Ermisch et al (2012), which it has not been possible to access during preparation of this response. However the relevant table from the book is on the publisher's website: it shows that the relationship between socioeconomic status and educational outcomes is strong for some countries and weaker for others, and that Australia is in the middle of the field.

3.1 What is meant by socioeconomic status?

Parental socioeconomic status is a composite measure that is measured in a variety of ways. The precision of the measure is important because less precision in the measure will reduce the observed association with achievement. It is also important that conclusions about the relationship be based on studies that encompass the full range of socioeconomic status because if the range is truncated (for example, to parental income alone) the measured association will appear to be less than the true association.

There is no agreed definition of socioeconomic status in universal use in the literature. The best measure of socioeconomic status used in survey research is the Index of Economic, Social and Cultural Status (ESCS)[1] developed as part of PISA. Even so this Index does not incorporate measures of background characteristics such as Indigenous status, language proficiency and geographic location[2] that are encompassed in the Gonski concept of aggregated social disadvantage.

3.2 Findings

In PISA 2012 the difference in average mathematical literacy scores between Australian 15-year-old students in the bottom and top quarters of socioeconomic status (ESCS) was 87 points (463 compared to 550 points). For reading literacy the corresponding difference was 86 points (471 compared to 557 points). These differences are substantial, and similar in magnitude to the differences between Indigenous students and non-

[1] ESCS is made of measures of parental occupational status, parental educational attainment, and home possessions relating to wealth, educational resources and cultural possessions.
[2] These effects of these measures are analysed specifically in PISA but they are not included in ESCS.

Indigenous students (90 points in mathematics and 87 points in reading). In mathematical literacy the difference associated with one additional year of schooling in Australia was 35 score points (Thomson et al, 2013). In reading literacy the corresponding difference associated with one year of schooling was 34 score points[3].

In PISA, the OECD reports the strength of the relationship between student performance and ESCS in terms of the percentage of variance in achievement explained by ESCS, and in terms of the slope of the socioeconomic gradient (the score point difference associated with one standard deviation increase in ESCS). In Australia in 2012, 12 per cent of the variance in mathematical literacy was explained by ESCS. This is somewhat greater than that suggested by Prof. Ergas. Australia's percentage was greater than Canada (9 per cent), similar to the UK (12 per cent) and less than the USA (15 per cent). The OECD average was a little higher (at 15 per cent) than that for Australia.

The OECD also reports the slope of the relationship between socioeconomic status and achievement (called the socioeconomic gradient). The socioeconomic gradient for mathematical literacy in Australia in 2012 was 42 score points: greater than that for Canada (31 score points) and the USA (35 score points)[4], similar to the UK (41 score points) and less than New Zealand (52 score points). Overall slope of the gradient between socioeconomic status (ESCS) and mathematical literacy in Australia is close to but a little higher than the OECD average (which was 39 scale points) (Thomson et al, 2013: 273-4). Therefore it is not comparatively small. In Australia in 2012 the correlation coefficient between ESCS and mathematical literacy was 0.35 (to use the metric corresponding to that in the Ergas submission) and in reading literacy it was 0.34.

Similar patterns are evident in NAPLAN scores in primary schools. The differences for New South Wales and Victoria[5] in reading achievement between Parental Occupational Group 1 (senior management and qualified professionals) and Parental Occupational Group 4 (machine operators, hospitality staff, assistants, labourers) are substantial even in these primary school years[6]. In Year 3 the differences are 44 and 34 points for New South Wales and Victoria respectively and in Year 5 the corresponding differences are 58 and 51 points. These can be viewed in the context that the national

[3] Across 34 OECD countries the effect of one year of schooling was 41 score points in mathematical literacy and 37 points in reading literacy (Thomson et al, 2013)

[4] Note that a different perspective is generated from this measure for the USA compared to the percentage of variance explained.

[5] These are two jurisdictions in which there is the most comprehensive coverage of parent occupation (and education) data with coverage of 89% (NSW) and 97% (VIC) of students respectively.

[6] The parent occupational groups used by ACARA for reporting NAPLAN results are: (1) senior management and qualified professionals, (2) other business managers and associate professionals, , labourers as well as the category 'not in paid work in the past 12 months'.

difference in reading achievement between Year 3 and Year 5 is 83 scale points.

Data on level of parent education show similarly stark results. The achievement gaps between students with graduate parents and those whose parents did not complete Year 12 are equivalent to about two years of schooling at Year 5 and up to four years at Year 9.

3.3 Two problems in the literature

Apart from the use of different definitions of socioeconomic status in the literature, which leads to false comparisons between apples and pears, there are two other issues that cause confusion.

The first is that many studies try to isolate the impact of socioeconomic status, usually narrowly defined, by adjusting for prior student achievement. This is a curious practice, as the prior achievement of students is heavily influenced by parental background, so that studies that adjust for it are reducing the impact of socioeconomic status.

An example is Marks (2010), which includes a measure of prior achievement as a variable, which dilutes the impact of family background. He also includes a range of measures of school climate that are often correlated with school socioeconomic status, such as teacher morale and commitment, student attitudes and behavior, and the disciplinary climate of the school, which dilute the impact of school socioeconomic status and leads him to the conclusion that socioeconomic status has little impact on student results. Marks' studies are the main source of these claims in Australia.

Another questionable practice in some studies is the inclusion of a range of other variables in regressions, which dilutes the socioeconomic effect. For example, Homel et al (2012) found that a range of cultural factors associated with disadvantaged families (including poor school experiences, participation in risky activities such as smoking and alcohol consumption, and low aspirations) are the main predictors of Year 12 completion for disadvantaged students and that family income has little effect. These results have been seized upon by some writers (for example Donnelly 2012) to claim that family income and occupation have little impact on school outcomes, yet they are clearly related to the cultural variables included in the study.

Having said this, it must be acknowledged that measuring the impact of socioeconomic status on achievement is rather harder than measuring the amount of salt in seawater – it cannot be boiled down, as Prof. Ergas proposes, to a simple 4 to 9 per cent. The PISA results are not easy to understand. The amount of variation in mathematics in 2012 explained by student socioeconomic status was 12.3 per cent: this is much higher than the estimate given by Prof. Ergas, but it still leaves much unexplained.

4. Variance in achievement within and between schools

Students vary in achievement, and the extent of variation is indicated as the variance in achievement scores. The total variance in student achievement is made up of two sources: the variance within schools and the variance between schools' mean scores. The percentage of the total variance that is between schools provides an indication of the extent to which schools differ in their average achievement scores. The balance of these two forms of variation also differs between countries. In some countries, students are very similar to each other within schools, but the schools are very different from each other in average performance. In other countries, schools are on average quite similar to each other in performance, but students within those schools vary considerably.

The extent of differentiation is influenced by factors such as explicit selectivity in entry to types of secondary school, the extent of enrolment in private schools and the extent to which residential location is socially stratified. The highest level of differentiation is found in tracked education systems where entry to secondary school is based on measured performance (e.g. Germany). The lowest level of differentiation is found in fully comprehensive school systems where there is little social stratification by location (e.g. Finland).

In Australia the results from PISA indicate that there was an increase in the percentage of variance between schools in reading between 2000 and 2009 from 20 to 26 per cent, and in mathematics between 2003 and 2012 from 22 to 28 per cent. The report of PISA 2009 suggests that school systems with low levels of differentiation are more likely to perform above the OECD average and show less pronounced associations of achievement with socioeconomic background (OECD, 2010a,b). It also appears that there may generally be a negative relationship between the change in mean performance for a country, and the change in percentage of variance that is between-school variance, even though there are some departures from the overall pattern (Ainley and Gebhardt, 2014). The OECD Education Policy Outlook for Australia observes that growing between-school differences in achievement is an issue, and counsels that it is 'important to ensure that there are mechanisms to mitigate this negative effect' (OECDb, 2013: 8).

5. The ecological fallacy

The Gonski Panel understood within-group variance, and knew that conclusions about individuals cannot be made on the basis of group data. When the ten thousand schools in Australia are ranked in order of achievement from highest to lowest, there are some disadvantaged schools in the upper quartile, and some affluent schools in the bottom quartile. Much might be learned from study of these few exceptions, but their existence does not negate the strength of the correlation between achievement (and under achievement) and advantage (and disadvantage) as reported by the OECD. No correlation is stronger.

The data referenced in this submission are student-level data. The Gonski Panel was concerned with funding the institutions that students attend, and therefore appropriately focused much of its attention on school-level data.

6. The Gonski funding model and the design of the loadings

It is important to understand that the proposed model for funding the schooling resource standard (Gonski Report 2011, fig 54, p 174) contains no dollar amounts, and was intended to be a high-level conceptual model for a sector-blind, needs-based aspirational new approach to school funding. It was put forward for testing and modification by the proposed National Schools Resourcing Body (NSRB).

Similarly, the school resource standard loadings, which are labeled explicitly 'indicative ranges' (Gonski Report, Table 20, p 169), were intended as a beginning point for the NSRB.

The 'indicative estimates' of the amounts per student – 'about $8000' for primary students and 'about $10,500' for secondary students – were advanced as 'a plausible and acceptable starting point for further work' to be undertaken by the NSRB with the states, territories and non-government sector.

Given that the Government failed to establish the NSRB, it is hardly fair to take the Gonski Report to task over lack of precision on the model and the loadings. Although the Gonski Review consulted widely with all sectors in the States and Territories, as a Commonwealth review it did not have access to the detailed data necessary at the level of those jurisdictions. The whole point of the NSRB was to bring all parties together to share all information around a common table, united in the principle of needs-based funding.

6.1 Proposed role of the NSRB

The NSRB was intended to be a joint Commonwealth/State and Territory body appointed by and responsible to all education ministers, and advised by a small group representative of the three sectors of schooling. An independent body, it was to make recommendations to ministers on the school resourcing standard per student amounts and loadings for each quadrennium, or at some other set interval, and on the annual indexation factor. It would do so within the framework of funds made available by ministers. Beginning in 2012, its proposed work program was spelled out in the Gonski Report (p 165-6, 170-1, 184-5, 191-5, and elsewhere).

6.2 The Gonski loadings for socioeconomic status

The formula proposed in the Gonski Report is not complex, as Prof. Ergas suggests. Indeed, there is no formula – only an indicative range for investigation by the NSRB. We proposed, on the basis of the necessarily incomplete evidence presented to the Review, that a good beginning would

be to look at a 10 per cent loading for each low SES student in schools with under 10 per cent of students in the lowest SES quarter, up to 50 per cent for each low SES student in schools with more than 75 per cent of students in the lowest SES quarter.

Several individuals and organisations have said that we did not set this starting point high enough. Prof. Ergas is more concerned with the non-linearity, the increasing effective marginal payment, and the flat payment after the 75 per cent threshold. While the establishment of a threshold might be an issue, this is not an argument against the concept of loadings. The principle is sound. Nevertheless, it should be noted that the practical effect of using the 75 per cent threshold for the maximum loading is not large, as only about 300 schools have a higher concentration of students from the lowest SES quartile.

To those with concerns about the loadings, the answer is that these were matters intended to be addressed, tested, refined and resolved by the NSRB, with full access to data from the three sectors at Commonwealth, State and Territory level.

6.3 The loadings under the Australian Education Act 2013

Given that the NSRB was not established, the base amount and loadings set out in the Act are now the important issue, not the Gonski starting point.

Senator McKenzie has asked whether, from my perspective, the base amounts and loadings are satisfactory and meet the Gonski objectives. Not having access to State and Territory data, nor to the negotiations between the Commonwealth and each jurisdiction, nor to other considerations leading to the drafting of these provisions, I find it impossible to make an informed judgment on that matter.

The formula for calculation of the base amount for each school at Part 3 Division 2 is entirely Gonski, but I can't see the link between that and the Gonski aspiration that the base rate (before loadings) should be set at the level of funding of our reference schools *i.e.* the 16 per cent of schools in which 80 per cent of students achieved above the national minimum year-level standard in both reading and numeracy in each of the three most recent years of NAPLAN results. For that reason, I wonder whether the differential between the base rate for primary and secondary schools reflects past practice (as did the Gonski beginning points), or is the result of deeper analysis.

The best I can say for the loadings is that they are workable, they are better than no loadings at all, and they are subject to future regular review as specified in Part 6 of the National Education Reform Agreement.

6.4 Loadings and perverse incentives

It is a little bizarre that Prof. Ergas is concerned about incentives creating greater social segregation when he says that there is no evidence that such segregation has any effect on student outcomes.

The basis of the calculations set out in section 4 of the Ergas submission is not explained, and the figures quoted are both internally inconsistent and not in accord with the Act. In the first instance, it is not clear how, on page 5, Prof. Ergas arrives at a loading for low SES of 0.59, when the maximum loading available is 0.5[7], applying to a school that has 75 per cent or more of its students from the lowest SES quartile.

Prof. Ergas does not indicate whether the calculation involves a non-government or a government school. However, if we accept his assertion that the additional student from the top 50 per cent of the SES distribution attracts a base amount of $6,878 (instead of the full base amount of $9,271), it suggests he is thinking of a non-government primary school, and by implication one with an SES figure of around 109[8]. Such a school could hardly be said to have a "high degree of disadvantage"[9]. The maximum SES loading for a quartile 1 primary student is $4636, and to qualify for that the school that Professor Ergas is postulating would need to have 75 per cent or more of students in that quartile. There are only twelve non-government primary schools in the country in that category, and they have SES numbers in the 80s not 109. Prof. Ergas's figures, as presented, make no sense.

A non-government school would not get the full base funding plus the disadvantage loading, as Professor Ergas's example claims. Instead, under Section 54 of the Act, it would receive a percentage of the SRS funding amount depending on its assessed capacity to contribute, plus a disadvantage loading depending on the SES quartile composition of the school. The total would be less than $14,715.

To consider a more realistic example[10], a disadvantaged non-government school on a SES score of 90 would receive $8,344 per student plus the disadvantage loading (quartile 1 plus quartile 2), averaging to around $2,648 per low SES student, which is approximately 29 per cent of SRS, giving a total average public contribution of $10,992 for those students. If that school then enrolled a student from the top 50 per cent of the SES distribution, it would receive base funding of $8,344. The differential in funding (i.e. - 24 per cent) would be nowhere near as large as represented by Prof. Ergas.

It is simply not true that a disadvantaged student in a non-government school attracts a different SES loading from a government school; indeed, the whole

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[7] Australian Education Act 2013; Section 38, sub-section 3

[8] Derived from the "capacity to pay" calculation.

[9] Such schools do exist in low SES areas now, creating the kind of segregation to which Professor Ergas refers, though they do it through preferentially enrolling the more well-off students from that area, not the less well-off as he hypothesises.

[10] Based on historical data for an actual Catholic primary school in western Sydney with approximately 70% of its students in Quartiles 1 and 2.

purpose of the model is to have sector-neutral loadings. It would appear from the document Prof. Ergas tabled at the Committee Hearing that he has averaged the disadvantage loading across the school population to get his result.

It is highly questionable whether the funding differences are sufficient incentive for a school to chase low SES enrolments and thereby create higher concentrations of low SES students, as Prof. Ergas claims. His assumption is somewhat removed from reality and ignores other incentives facing schools, especially non-government schools. Under current arrangements there is a strong incentive for schools to chase high achieving students because they are lower cost (in more ways than financial), and boost school rankings and reputations. For example, many private schools now ask for NAPLAN results before accepting enrolment applications.

Cobbold (2013) advances a second reason to question the Ergas claim: that international evidence suggests the disadvantage loadings are far too low to be effective. It is said that the base funding plus loading does not accurately reflect the true cost of educating a disadvantaged student to a given standard. Cobbold argues that the general consensus of studies is that the true cost is about double that to educate a non-disadvantaged student to the standard. Consequently, schools would be taking on a bigger challenge than they are funded to deliver.

In summary, I cannot see that these differences in the average loading per student are sufficient incentive for a school to chase more low SES students, given the other incentives facing schools. In any event, under the NSRB this issue would have been regularly reviewed and addressed, at least each quadrennium; under the National Education Reform Agreement it will be regularly reviewed by the Commonwealth and participating States.

As a footnote to this section, I am intrigued by Prof Ergas's comment that government schools are allowed to use recurrent funding to acquire land but private schools are not. No reference is given for this statement. Government schools have never been able to acquire land, whereas private schools can put aside recurrent funding for future capital purposes.

7. Vouchers and Sweden

The current funding arrangements for non-government schools, which provide a minimum entitlement of 13.7 per cent of AGSRC and a maximum of 70 per cent, have some of the characteristics of a voucher system. During the life of this system our national performance in education has steadily declined, including at the highest levels of achievement.

A voucher system is the antithesis of sector-blind, needs-based funding.

In his presentation to the Standing Committee Prof. Ergas commented on voucher systems, which he said have 'worked very well'. In particular he

commented on the voucher system introduced in Sweden around 1990, and for which he suggests ‘the results have been, by and large, very positive’ and have ‘put pressure on schools to compete’.

This is plain wrong. The fact is that the subsequent results for Sweden on a range of international assessments have been lamentable. On PISA mathematical literacy there was a decline in average scores of 31 points between 2003 and 2012, and a decline in PISA reading literacy of 33 points (one third of a standard deviation) from 2000 to 2012. These declines have been associated with a substantial increase in the variability between schools over the same periods (a doubling in the case of reading).

The IEA TIMSS results cover a longer period and show that there has been a similar large decline of 46 points (nearly one half of a standard deviation) over the period from 1995 to 2011 in the performance of Year 8 students from Sweden in mathematics (Mullis et al, 2012). The corresponding decline in science among Year 8 students in Sweden has been 44 points (Martin et al, 2012).

The Swedish National Agency for Education (Skolverket) has reported an increase in the variation in average final grades between schools between 1998 and 2004, with an increase in the school-level effects of socioeconomic background. This has led to greater social segregation in schools, which Prof. Ergas ignores despite his criticism of the impact of disadvantage loadings under the Gonski model. Sweden is now one of the few countries to show both worse results and more inequality. Skolverket sees free school choice as a contributing factor. The system, introduced 20 years ago, allows parents to choose between municipal schools and independent schools, all financed by tax money. The aim was to increase quality by competition, but it has also led to the best students flocking to the same schools (Skolverket, 2009).

More recently, Skolverket (2013) has concluded “The decreased equity level needs to be taken seriously. In international comparisons, Sweden distinguishes itself as a country where both student performance and equity have declined during the 2000s. The Agency believes that further strong measures are required to increase equity. The school choice reform has probably contributed to the increasing performance differences between schools and thus to decreased equity.”

International evidence from Europe, the United States and elsewhere fails to demonstrate any significant improvement in educational performance under a voucher system. Cobbold (2011) estimated that the full voucher model proposed to the Gonski Review by Independent Schools Victoria would provide a funding increase of about $4.6 billion a year for private schools compared to their actual funding in 2009. The Centre for Independent Studies voucher model would provide a funding increase of $3.5 billion a year. This would provide a huge windfall gain for private schools, with no assurance of any improvement in the quality of education.

8. **Economic modeling**

Senator Wright asked me a question about the social and economic costs of not implementing needs-based funding along the lines of the Gonski recommendations. There is no doubt that failing to educate all young people to their full capacity means failing to realize our national potential stock of human capital. That is a cost to the country and to the individual. As I said in my verbal response, it is as if some precious metal, of more value to the country than the cost of its extraction, was nevertheless left undisturbed in the ground.

Among the submissions received by the Gonski Review was material relevant to measuring the social and economic costs of such failure. The Australian Education Union has prepared a summary of this material, together with other useful contributions and references to other sources, and has given me permission to use it. I attach this summary as Appendix 1.

The summary confirms my belief that funding education is an investment not a cost, and that the dividends arising from that investment are potentially enormous. The knowledge-based economy of the future requires needs-based investment today.

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APPENDIX 1

THE ECONOMIC AND SOCIAL RETURNS OF EDUCATION: A SUMMARY

ECONOMIC RETURNS OF EDUCATION
This is a heavily contested area and figures on the impact of education levels on participation and productivity and returns to individuals and to societies/nations vary wildly depending on context and factors such as the predispositions of the economists/organisations involved.

Economic Benefits for Australia
PwC analysis November 2012 'Cost of school decline: $1.5 trillion', Australian Financial Review
19 November 2012

- PwC analysis is based on and updates earlier work done by the OECD which modelled the potential economic benefits to countries if they increased their educational performance in line with that of Finland.
- improving Australia's schools' performance in maths and science to that of Finland, the top-ranked country, would deliver $3.6 trillion in benefits between 2012 and 2092; twice Australia's annual economic output now.
- but if Australia's educational performance declines in line with projections it will lead to a drop in productivity and wipe $1.5 trillion from the economy over the same time.
- PwC finds that lifting Australia's educational performance to Finland's level would deliver even more economic benefits; an annual increase to GDP of 0.29 per cent through higher levels of employment, higher wages and productivity plus nonmonetary benefits. The cost of not doing so would be the equivalent of 115 per cent of our GDP in 2011-12.

Gonski Review:

- *KPMG Econtech (2010) has attempted to estimate the potential*

contribution of the COAG productivity agenda to labour productivity, labour force participation and the Australian economy. It found that the school reforms, specifically achieving the National Partnership target to increase Year 12 or equivalent attainment rates to 90 per cent by 2015, could generate medium to long term economic gains in the order of an annual average increase of 0.65 per cent in GDP over the period 2010 to 2040. This would be achieved through increased skill levels for the average Australian worker and would represent an additional $11.8 billion (in 2008–09 prices) annually in the economy. (p30)

NOUS Group Gonski Review Commissioned Research: The costs of having students not reaching their full potential are too large to ignore.

- *extensive research into the economic benefit of educational achievement shows that a small increase in educational performance can deliver large increases in economic outcomes.*

- *For example, research by Hanushek and Woessmann demonstrated there were significant economic gains to be made if countries improved the cognitive skills of their citizens, as measured through educational outcomes.*

- *They estimated that an increase in the average PISA scores in Australia of 25 points (or 5%) would result in increased economic growth. From the period 2010 to 2090 the net present value of that growth would amount to US$2,527 billion. Alternatively a 2005 Access Economics report estimates that increasing the Year 12 or equivalent attainment rate to 90%, which would be an increase of 50,000 students per year, would increase GDP by 1.1% by 2040.*

- *Just as the economic benefits of education are significant, so is the opportunity cost of not improving performance, both in terms of individuals' life chances and in aggregate terms for the national economy.*

Business Council of Australia, *Restoring our Edge in Education: Making Australia's Education System its Next Competitive Advantage* (2007)

- *If we are to be competitive we need a skilled workforce that is able to drive productivity growth. The key to a skilled workforce is a high-quality and world-leading education system.*

- *Sustained improvements in GDP per capita are delivered by significant gains in productivity.*

- *... Secondary school education and training is central to this objective. Providing world-class, high-quality education and training to young Australians will provide a foundation for our goal of becoming one of the top-five OECD nations for standard of living. [Exec Summary]*

- *Future levels of educational attainment in Australia will be key determinants of individual, social and economic prosperity. For individual Australians, higher levels of education and training offer the possibility of escaping disadvantage, realising potential, securing meaningful work and achieving increased earnings. For society as a whole, levels of education and training are positively and strongly correlated with a range of measures of health, family functioning, children's wellbeing, a clean environment and the absence of violent crime (Leigh, 1998). And from the point of view of the Australian economy, levels of education and training are directly related to levels of workforce participation and national productivity.*

- *Future policies that deliver an increase in education and training levels are likely to have wide-ranging benefits for individuals, standards of living and social cohesion (Access Economics, 2005).*

- *From an economic perspective, we know that achieving our target of 90% of young people completing Year 12 or equivalent would add an annual average of $11.3 billion to our national economy.* (Education Minister Peter Garrett, 21 September 2012)

- *Investment in the education, skills and training of our people is the single most important thing we can do as a nation to lift productivity.* Kevin 07

- *If the percentage of young people completing Year 12 or its equivalent were increased from 80 per cent to 90 per cent, GDP would be $1.8 billion (i.e., .28 per cent GDP) higher in 2020 than it would otherwise have been.* (Business Council of Australia, 2003)

- *An additional year of education may raise the level of productivity by between 3 and 6 per cent for a country with Australia's current average education level.* (OECD, 2003)

The impact of student performance on GDP

Ben Jensen on the relationship between countries' education and their economic growth.
http://grattan.edu.au/static/files/assets/b8e7dc66/057_report_education_inves

ting_teachers.pdf *(November 2010)*

- Body of OECD and World Bank work focusing on the idea that school quality (as measured by student performance in international tests) drives economic growth.
- While estimates of the impact of student performance on GDP growth vary, a conservative estimate is that increasing international test scores by one standard deviation would lift GDP growth by 1%.

Benefits for individuals

- *In terms of benefits to the individual, completing Year 12 alone has been estimated to return a 15% increase in lifelong earnings and close to a 20% increase for completing an AQF Certificate III or IV.* (Nous Group, Commissioned Research for the Gonski Review 2011)

- *In terms of benefits to the individual, completing Year 12 alone has been estimated to return a 15% increase in lifelong earnings and close to a 20% increase for completing an AQF Certificate III or IV (The Nous Group 2011). Year 12 or equivalent attainment also contributes to a more skilled workforce, and consequently ongoing economic development and improved living conditions.* (Gonski, p29)

- *The percentage increases in lifetime income for higher qualifications are significant and have risen substantially as Australia transitions to a high skill economy. Finishing Year 12 brings a 25.4% benefit, skilled labour 46.5%, a bachelor degree 73% and a higher degree 81.7%.* (ABS 2010)

- LSAY Research Report 55 *The Occupations and Earnings of Young Australians: The Role of Education and Training* (ACER, Gary Marks)
  - *Overall, the results provide a positive message for education and training. In general, post-school education and training leads to higher status occupations and, in particular, higher earnings compared to not doing any further study or training.*
  - *A bachelor degree qualification had the largest impact, increasing earnings by about 30 per cent. The effects of bachelor degrees were slightly stronger among women than among men.*
  - *Apprenticeships also had a major impact on earnings, and on average increased weekly earnings by about 20 per cent. This effect was stronger among young men than among young women.*
  - *A TAFE diploma qualification increased earnings by about 14 per cent; and a university diploma by nearly 20 per cent.* (pp.ix-x)

- *The OECD estimates that each extra year of education increases earnings by around 10%, or by about $100 per week for full time workers.* Julia Gillard and Labor: *Creating jobs and skills in Australia 4. Skills for a competitive economy* p13 (2010) http://www.alp.org.au/getattachment/df4001ca-e26b-4938-938d-76a2446a5ec4/creating-jobs-and-skills-in-australia/

- One extra year of schooling increases an individual's earnings by up to 10%.
  UNESCO: Education Counts Towards the Millennium Development Goals http://unesdoc.unesco.org/images/0019/001902/190214e.pdf

- Compared with people who complete Year 12 or equivalent, early school leavers tend to be less likely to work and tend to earn less when they are employed. (Productivity Commission, 2006)

- For every additional year of education, the earnings of an Australian worker increase by between 5.5 and 11%, all other things being equal. (Productivity Commission, 2006)

For Nations

- *In the knowledge economy, education is the new currency by which nations maintain economic competitiveness and global prosperity.* (US Secretary of Education Arne Duncan, 5 October 2012)

- Each additional year of schooling raises average annual GDP by 0.37%.
  UNESCO: Education Counts Towards the Millennium Development Goals http://unesdoc.unesco.org/images/0019/001902/190214e.pdf

- *Education transforms countries and societies; an extra year of quality schooling lifts a country's annual economic growth by 1%. ... Confirming recent studies, the empirical evidence suggests high returns to investment in education: one extra year of average education (corresponding to a rise in human capital by about 11%) would lead to an average increase in output per capita by around 9%.*
  OECD May 2012 http://www.oecd.org/dataoecd/20/5/50423364.pdf

- ***NOUS Group Gonski Research: The dividends from engagement in schooling extend to broader 'quality of life' dimensions***

  The benefits of schooling are not confined to producing higher levels of cognitive skill. There are a broad range of social benefits from

education that enable a school graduate to participate successfully in society and to enjoy better quality of life as measured over several dimensions. Researchers have tended to focus on three areas when considering the wider impacts of education: health and wellbeing; crime; and civic and social engagement.

Developing countries

- 10-15 fold return in developing countries: the tenth Education for All Global Monitoring Report shows that every $1 invested in education and youth skills in developing countries generates $10-$15 in economic growth, according to a UN Educational, Scientific and Cultural Organization (UNESCO) report **Error! Hyperlink reference not valid.**

Economic Benefits of Early Learning for disadvantaged kids

- 4-8 fold return for early learning/disadvantaged kids - cost-benefit analyses performed on the long-term returns of quality early childhood programs show returns of $4 to $8 for every $1 invested.
- The return on investment is significant for the individual (in increased earnings), the government (in decreased special education, remediation, and welfare costs), and society (in decreased crime and its related costs).
- Most of the costs are incurred by age 5; the majority of the benefits occur between the ages of 18 and 27.
- Cost benefits are calculated by adding all of the proven cost savings generated from such programs (plus the other related costs incurred, such as increased public expenditures as more youth attend public colleges), and then subtracting the cost of the original implementation. (US research [Heckman and others] - as summarised (accurately) by the Gates Foundation)

Benefits of ECEC investment

- The OECD Starting Strong (A Quality Toolbox for Early Childhood Education and Care) series (2001, 2006, 2012): A growing body of research recognises that investment in early childhood education and care [ECEC] brings a wide range of benefits, for example:
  - better child well-being and learning outcomes as a foundation for lifelong learning;
  - more equitable child outcomes and reduction of poverty;
  - increased intergenerational social mobility;
  - more female labour market participation;
  - increased fertility rates; and
  - better social and economic development for the society at large.

The impact of education levels on participation and productivity

NOUS Group Gonski Review Research:

- *Improvement in Australia's human capital through improved school outcomes will be needed to achieve sustained increases in productivity performance. The Intergenerational Report states that over the next 40 years, we will need to hit a productivity growth rate of 1.6% per annum to sustain our GDP per person growth.*

- *Australia's productivity performance has slowed in the recent past, averaging only 1.4 % in the past decade compared with 2.1% in the 1990s. High-quality schools and education systems are the best way to improve our labour force and promote innovation and technological improvement.*

- *Education also has a strong positive impact on individual financial stability. The positive link between years of schooling and lifetime earnings is now one of the best established facts in labour economics.*

- *Those who disengage early from school generally have increased likelihood of experiencing unemployment and low life-long income. In Australia, Year 12 graduates (or those with a Certificate III/IV) earn at least 10% more per week than those who dropped out in Year 10. Figure 27 presents data from the ABS showing a clear relationship between increased levels of education and average weekly earnings.*

- *Using the Household Income and Labour Dynamics in Australia (HILDA) data set it is possible for us to calculate the returns on educational attainment (see Figure 28). The results show that the return to the individual of completing Year 12 is a 15% increase in hourly wages, and close to 20% for completing a Level III or IV Certificate.*

- *In addition to the positive impacts of lifting Year 12 or equivalent attainment rates and increasing student performance, the quality of educational outcomes achieved is important for two reasons:*
    - *First, it improves employability and earnings for the individual that in turn bring benefits to the wider economy (not just through increased productivity and competitiveness, but through higher tax revenues).*
    - *Second, there is a well-established link between poor school performance, and the probability of dropping out of school. NILS has used the PISA 2006 and Longitudinal Study of Australian Youth (LSAY) datasets to determine the impact that student and*

school characteristics have on the probability of dropping out of school and not undertaking further training. The analysis confirms the correlation between lower scores and the likelihood of students dropping out of school (see Appendix E.2.)

- *increasing the educational attainment rate of the current generation has a direct impact on the educational outcomes of the next generation, as research has consistently shown that parental education levels have a significant impact on the educational outcomes of a student. There is a compounding effect in that higher attainment leads also to higher incomes, so the combination of both parental educational achievement and higher socio-economic status brings dual advantages to the child's prospects of doing well at school. It is worth noting that Finland has a long history of high levels of educational attainment, which is one of the factors that drive its current levels of high performance.* (p41)

OECD Education at a Glance Annual Reports *2013 Report: Chapter A Indicator A5: How does educational attainment affect participation in the labour market*

- *Across OECD countries, employment rates are highest among people who have a tertiary education; and these individuals are also most likely to be employed full time.*

- *Unemployment rates are nearly three times higher among individuals who do not have an upper secondary education (13% on average across OECD countries) than among those who have a tertiary education (5%).*

- *Individuals who have at least an upper secondary education have a greater chance of being employed than those without that level of education.*

- *Gender differences in employment rates are smallest among tertiary-educated individuals and largest among men and women who do not have an upper secondary education.* (p75)

- *The probability of working full time increases with the level of education. Some 64% of people with below upper secondary education work full time, while 71% of people with an upper secondary education and 75% of people with a tertiary education work full time.*(p76)

Chapter A Indicator A6: What are the earnings premium from education

Educational attainment and relative earnings

- *The higher the educational attainment, the larger the relative earnings; and upper secondary education appears to be the gateway to the largest wage increases. Earnings differentials between adults with tertiary education and those with upper secondary education are generally more pronounced than the differentials between upper secondary and lower secondary education or below.*

- *In all OECD countries, adults with tertiary education earn more than adults with upper secondary or postsecondary non-tertiary education, who, in turn, earn more than adults with below upper secondary education.*

- *Tertiary-educated adults earn more than adults with lower levels of education in all countries. The relative earnings for tertiary-educated adults is over 1.5 times that for adults with upper secondary or post-secondary non-tertiary education, on average ...* (p102)

Chapter A Indicator A7: What are the incentives to invest in education?

- *The private returns on investment in tertiary education are substantial.*
- *Not only does education pay off for individuals, but the public also benefits in the form of greater tax revenues and social contributions.(*p126)

An increase of 1% in a country's literacy scores relative to the international average is associated with an eventual 2.5% relative rise in labour productivity and a 1.5% rise in GDP per head. These effects are three times as great as for investment in physical capital. Moreover, the results indicate that raising literacy and numeracy scores for people at the bottom of the skills distribution is more important to economic growth than producing more highly skilled graduates. (Coulombe & Tremblay, 2005)

Cautions: Mixed Empirical Findings.

OECD The High Cost of Low Educational Performance. The Long-Run Economic Impact Of Improving Pisa Outcomes (OECD 2010)
http://www.oecd.org/dataoecd/11/28/44417824.pdf

- *This report uses recent economic modelling to relate cognitive skills – as measured by PISA and other international instruments – to economic growth. This relationship indicates that relatively small*

improvements in the skills of a nation's labour force can have very large impacts on future well-being. ... The report also shows that it is the quality of learning outcomes, not the length of schooling, which makes the difference. (p6)

- *… average years of schooling are a particularly incomplete and potentially misleading measure of education for comparing the impacts of human capital on the economies of different countries. It implicitly assumes that a year of schooling delivers the same increase in knowledge and skills regardless of the education system.* (p13)

World Bank*: *Economic returns to investment in education

- ***Does investment in education necessarily enhance economic growth?***
  There are compelling reasons that it should, but the empirical evidence does not always support this conclusion. (p40)
  http://siteresources.worldbank.org/INTMENA/Resources/EDU_02-Chap02-Education.pdf

- *There are then compelling reasons to believe that education increases productivity and brings about other economic and social attributes that contribute positively to economic growth. The problem is that the empirical evidence demonstrating the education–economic growth relationship shows mixed results, and often rejects the hypothesis that investment in human capital promotes economic growth.* (p42)

Ben Jensen on the relationship between countries' education and their economic growth. (November 2010)
http://grattan.edu.au/static/files/assets/b8e7dc66/057_report_education_investing_teachers.pdf

Years of schooling and economic growth

- Initial research focused on the effect of education, as measured by the average years of schooling in a country.
- Difficulties in drawing conclusions from the research about the impacts on economic growth.
- These difficulties have contributed to a shift in the empirical research. Increasingly, analysis is focusing more on what students learn and less on how many years they attend school.

Student performance and economic growth
Empirical analysis of the relationship between student performance and economic growth shows that economic growth correlates more closely with student performance (as measured by test scores) t