Private School Usage in Australia 1975–2010: Evidence from the Household Expenditure Surveys

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Abstract: The use of private schools in Australia has increased greatly since the 1970s. This paper shows that most of the growth has been concentrated in attendance at low-fee schools, while the growth in using high-fee schools has been modest. Furthermore, the increase has occurred for households at all income levels, for both single-parent and two-parent households, for households of all sizes, and irrespective of whether the household reference person is born in Australia or elsewhere. However, increasing income and changes in household composition can account only for a small part of the trend.

Keywords: Private schools, school choice, household expenditure survey.

JEL classification numbers: I2, N3.

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1 Introduction

Since the early 1970s, the proportion of Australian school students who attend private schools has grown from about one fifth to about one third.[1] At the same time, the proportion of private-school students who attend a Catholic school has dropped from about four in five to three in five, with the balance of students in so-called 'Independent' schools. While the growth in the private sector share has stalled since 2013, the landscape of Australian schooling has changed substantially since the 1970s. Many factors are likely to have contributed to the growth in private school attendance over this time. On the demand side, these include economic and demographic factors such as individual income growth, the rise in two-income families, the reduction in average family size, and the increase in single-parent families, all of which affect equivalised household income and the affordability of private schooling. In addition, there may have been changes in preferences towards private schooling, for example because of perceived or actual changes in relative quality between the school sectors, or because of immigration and changes in the religious identification and attitudes. On the supply side, there have been changes in the number of private schools operating, increases in resources through higher tuition fees and government grants, with associated changes in the quality of the schooling offered.

This paper looks at the growth in private schooling using data from the Australian Household Expenditure Surveys (HES). The trend towards private school usage apparent in the Australian Bureau of Statistics' (ABS) censuses of school enrolment is reflected in growth in the proportion of households with positive expenditure on private school fees in the HES data. The HES have been carried out by the ABS every six years or so since 1975/1976. Hence, the HES data offer a rare opportunity to look at household choices as far back as the mid-1970s and study the role of some of the potential key factors, notably the role of income and demographic changes, including family structure and immigration. We consider the data from 1975/1976 to 2009/2010 and restrict the analysis to households that have at least one school-aged child and at least one adult. Using the information on school expenditure and the number of children, we determine

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[1]Our data sources are listed in Appendix A.

whether each household is using government schools, low-fee private schools, high-fee private schools, or a combination thereof. We define 'low fees' as being similar to those charged in the Catholic school system. Our aim is to study how household income and household composition is related to the use of private schools and to investigate the extent to which changes in household income and composition can account for the trends in the use of private schools. We use multinomial logit models to study the role of household income, household composition and parental birthplace on membership of these groups.

The main conclusion from this analysis is that most of the increase in enrolments at private schools since the mid-1970s has taken place in low-fee private schools. The increase has occurred for households at all income levels, for both two-parent and single-parent households, for households of all sizes, and irrespective of whether the household reference person is born in or outside Australia.

To examine the contribution of income growth and changes in household composition to the trend towards private schooling, we complement the analysis with some counter-factual calculations, where we compute predictions holding either the covariates or the parameters constant over time. This exercise confirms that the increase in income and the demographic changes that occurred over the period cannot account for much of the trend towards using private schools in Australia. The trend must have been driven by other factors, such as changes in access to private schools, changes in perceptions of school quality, or changes in preferences for faith-based schools.

Following the report of the Karmel Committee in 1973, the federal government greatly increased grants to private schools. The real value of grants to both Catholic and Independent schools have continued to grow since that time and are now very substantial. Did the additional resources contribute to the increase in the usage of private schools? What are the long-term mechanisms that come into play when a government begins to subsidise the private school sector? While the present paper does not speak directly to these questions, it establishes that the usual household demand side factors seem to have little to do with the shift towards increased private school usage since the 1970s. Further, this increase in attendance occurred despite real private school fees rising (Ryan and Watson,

2010).

The paper is organised as follows. Section 2 provides a brief summary of the literature on households' school decisions. Section 3 explains the main Australian school sectors and funding arrangements. Section 4 describes the data. Section 5 presents our main analysis. Section 6 concludes with a discussion of potential drivers of the trend towards private school usage and avenues for further research.

2 Literature review

In one of the first papers on education expenditure, Peltzman (1973) analyses education like any divisible, homogeneous good, whose demand reflects its price, the prices of other goods, household income, and household preferences. This model is adapted by Dynarski, Gruber, and Li (2009) to examine expenditure on private schooling in the presence of publicly provided education. They also extend the model to show how heterogeneity in preferences affects decision-making, as well as the size of any subsidy or voucher to private schooling. According to these models, an analysis of the demand for or incidence of private schooling should aim to capture the effect of its price, of variations in household income, and of differences in household preferences.

There are some important respects, however, in which education may not suit standard consumer demand analysis: the relative quality of the education provided by the public and private sectors (and within sectors) may not be identical; peer effects may mean that the outputs produced by education providers may depend on the characteristics of others who use the same services; and it is a multi-dimensional product in that 'education' involves both academic and forms of non-cognitive development that households may value. Neal (1997) offers a simple model of school choice, where the eventual choice of families depends on how they assess the academic and other outcomes provided by public and private schools (so quality differences are taken into account in the choice), and the cost of the tuition charges in the private sector in combination with family income. Families assess these different components differently because their preferences differ, which leads to heterogeneity in their observed choices. Families may make their choices

with the likely choices of others in mind.

Many empirical studies find that the incidence of enrolment in private schools increases with income, or where income data are not available, with some socio-economic status (SES) measure of the social background of households or communities. For Australia, Vella (1999), Le and Miller (2002), and Ryan and Watson (2009, 2010) find that the incidence of attending a private school increases with the social background of families (based on parental education and occupation, or indicators of household wealth), but that the effect is more pronounced for enrolment at Independent schools than Catholic schools, where enrolment rates are more evenly spread across the distribution. Mavisakalyan (2009) finds that the private school enrolment rate increases with family income, average regional income and, at least for primary enrolments, income inequality. Dearden, Ryan, and Sibieta (2011) also find that enrolment in Independent schools increased with family income in Australia, but that attendance at Catholic schools increased by less across the income distribution.

The influence of non-economic factors has also been studied in the Australian context. For example, both Vella (1999) and Le and Miller (2002) find that the actual or likely Catholic background of families has a positive impact on whether or not children attend Catholic schools, while Mavisakalyan (2009) finds a more general positive effect for religiousness on attendance at private schools; Le and Miller (2002) find that as the number of siblings in a family increases, the incidence of attending a Catholic school rises and the incidence of attending an Independent school falls; Graetz (1990) finds that the children of parents who attended Catholic or Independent schools are more likely to attend the same type of school; and Mavisakalyan (2009) finds evidence that high immigrant populations in urban locations induce 'native flight' into private education. Using more recent data, Dearden, Ryan, and Sibieta (2011) find the same intergenerational effect as Graetz (1990), with the probability of Catholic school attendance being almost 30 percentage points higher among individuals with parents who attended a Catholic school (or 15 percentage points higher if just one parent did so), while individuals with parents who attended an Independent school were close to 20 percentage points more likely to attend

an Independent school.

A study by Williams (1985) points to the importance in changes in the 'quality' of education provided by the government and private school sectors on the private school enrolment rate in Australia. He finds that the private school enrolment share responds positively to improvements in quality, where quality is measured by student-teacher ratios and government grants relative to school tuition revenue. More recently, Ryan and Watson (2010) find that after the mid-1980s private schools continued to use increased government funding to lower student-teacher ratios rather than reduce fees, and this had tended to induce quality-sensitive high-SES students into the private school system.

The present paper contributes to the literature by studying the long-term trend in private school usage in Australia apparent in other ABS data using micro-data that link school usage with household income and other characteristics. The HES data provide a rare opportunity to look back to the time when the federal government first began to subsidise private schools for recurrent expenditure. (It had previously subsidised small capital programs.) The HES data allow us to examine the role over time of some of the factors that the previous literature have considered potentially important for the decision to use private schools. These factors include household income and household composition. Factors the HES data are not informative about include detailed household ethnic/cultural background and religious affiliation, as well as supply-side factors such as access to private schools and school quality.[2]

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[2]The Longitudinal Survey of Australian Youth (LSAY) series has only limited household information and does not include income. The Household, Income and Labour Dynamics in Australia (HILDA) survey only goes back to 2001. The annual ABS *Schools, Australia* series lacks household information.

3 Australian schools

3.1 Three sectors

The public school system in Australia is administered at the state government level.[3] There are eight separate public systems, with slight variations in how they are structured. The Catholic schools are also organised via state-level Catholic authorities, while the other private schools are known as 'Independent' because they have traditionally not belonged to school 'systems'. State public education authorities are responsible for determining educational policies in the areas of curriculum and state-wide student assessment, final year assessment and certification, as well as the registration of private schools.

In institutional terms, Catholic schools in Australia are traditionally more similar to public schools than to Independent schools. The vast majority of Catholic schools are part of mass systems of both primary and secondary schools within each state, serving rural as well as urban areas. They are administered by state-wide Catholic education agencies that allocate funding, determine staff salaries, and provide curriculum guidance (including a faith curriculum) to schools at all levels.

The majority of Independent schools in Australia have a non-Catholic religious affiliation. Many are community-operated schools, and some are based on a particular educational philosophy such as Montessori or Steiner education. Traditionally, Independent schools have been concentrated in urban areas and focused on the preparation of students for university. However, the Independent schools sector is now the fastest growing sector of private schooling in Australia and has gained an increased share of the student population over the past decades (Independent Schools Council of Australia, 2017).

Figure 1 shows the private school student enrolment shares for primary and secondary schooling in Australia since the early 1970s. A number of features of enrolment patterns are evident. First, private schools have a larger share of enrolments at the secondary level

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[3]The Commonwealth of Australia consists of six states and nine territories. The seven minor territories are administered either by the federal government or by a nominated state government. The two major territories, the Northern Territory and the Australian Capital Territory, function as states in most respects; in particular, they administer their own school systems. For simplicity, we therefore refer to the six states and the two major territories as 'states'.

than at primary school. Second, while the private shares were decreasing in the early 1970s, since 1978 the enrolment shares have increased substantially. Third, the increases have been relatively consistent across the entire period since the late 1970s, with the share for primary and secondary schools growing by around 0.36 and 0.45 of a percentage point per annum.

Growth in the private school student enrolment share stalled between 2013 and 2015 when it reached 36.0 and then reversed, declining to 34.5 in 2017. This constituted a major change in the growth rate of this share. From 2008 to 2017, this share grew by just 0.2 of a percentage point in total, but had previously grown by 0.4 percentage points per annum since the late 1970s. The recent decline in the private school student enrolment share since 2015 appears to be concentrated in primary schools in the Catholic school sector.

Figure 2 shows the share of private school student enrolments in Catholic schools in Australia since the early 1970s. While student numbers have increased in both sectors, it is clear that the growth has been more pronounced in the Independent school sector, since its shares of private primary and secondary enrolments have increased by over 20 and 10 percentage points respectively.

3.2   Funding arrangements

Under the Australian constitution, power over education resides with state governments. Consequently, the operation of public schools is the responsibility of state governments, which provide most of their funding. Public schools are fully government funded, although they conduct modest fund-raising and may seek largely nominal voluntary contributions from the families of students. Through its constitutional power to provide specific purpose payments to the states, the federal government also provides some funding for public education, but provides more money directly for the operation of private schools. These payments effectively provide a (partial) voucher for all students to attend the school of their choice in the private sector. The amounts have been based variously on the ability of the schools to raise income from fees and the average social background of its students.

Students attending Independent schools typically attract a smaller federal voucher than those in Catholic schools. Federal grants to private schools are supplemented by state government grants to the value of approximately half the federal grant.

Figures 3 and 4 show the evolution of average per-student fees and (state and federal) subsidies collected by Catholic and Independent secondary schools since 1970. By comparing the figures, it is clear that per-student fees on average are low in Catholic schools compared to Independent schools. However, there are also differences in the range of fees between sectors. If they do not set fee levels of schools directly, the state-level Catholic authorities issue guidelines that largely determine the magnitude of fees in Catholic schools. Therefore, fees do not vary much across Catholic schools. In contrast, fees vary considerably across Independent schools. For example, a 2003 survey of fees charged for Year 12 students in Independent schools found that these ranged from around $500 to $19000 per annum, with a mean fee of $6500 and median $4500 (Watson, 2004).

Grants have become an increasingly important part of private school funding over the period. Figures 3 and 4 show that Catholic schools receive more in government grants than they receive in fees. Since about 1980, schools in the Catholic system receive combined federal and state grants per student that are worth 70–80 per cent of total resources. Independent schools receive smaller grants, and grants constitute only around 40–50 per cent of resources. However, it is important to keep in mind that the trends in the Independent sector partially reflect compositional changes, with the number of low-fee schools growing substantially since the 1970s, lowering the average fees in the sector and increasing the average government payment per student in the sector (other things equal).

In sum, it is clear from Figures 3 and 4 that, on average, per-student resources are greater in the Independent sector than the Catholic sector, but that the largest grants go to the Catholic system.[4]

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[4]Since 2010, successive Australian governments have negotiated the introduction of a new funding model for Australian schools, based on the recommendations of report prepared by a committee chaired by businessman David Gonski (Gonski, Boston, Greiner, Lawrence, Scales, and Tannock, 2011). The proposed funding arrangements have not yet been fully implemented in Australia because the Commonwealth Government has found it very difficult to get lasting agreement to the new arrangements from all school sectors. The changes will result in increased per student resources for all school sectors.

4 Household expenditure survey data

In this section, we briefly introduce the HES data and explain how we construct our measure of high- and low-fee private school usage. The surveys were conducted in the financial or calendar years 1975/1976, 1984, 1988/1989, 1993/1994, 1998/1999, 2003/2004, 2009/2010, and 2015/2016. For reasons outlined in Section 4.7, this study examines waves 1975/1976 through 2009/2010.

4.1 Population

The natural population of interest is Australian households with children who attend (any) primary or secondary school, since these are the households who choose between government and private schools. Unfortunately, there is information about the number of children attending school only from the 1993/1994 survey onward. Mainly the data files have information about the number of people in each household in given age ranges. Unfortunately, the age ranges vary and it is not possible to separate primary-school- and secondary-school-aged children in all surveys.

To maximise comparability across surveys, we restrict our sample to households with at least one school-aged child and at least one adult present at the time of the interview. Specifically, our sample consists of all households with at least one person between the age of 5 and 17 and at least one person aged 18 or over, except in the 1988/1989 data where the age ranges are 5–16 and 17–99 years. In the following, we refer to these ranges as 5–17(16) and 18(17)–99, respectively.[5]

A further problem arises because not all surveys cover all of Australia. In particular, the Northern Territory is omitted from the data files in 1975/1976 and 1984 and combined with the Australian Capital Territory in 1988/1989, 2003/2004, and 2009/2010. Consequently, we omit both territories from the analysis. We refer to the final sample as the 'regression sample'. Table 1 shows the total number of households surveyed and the size of the sample.

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[5]This sample includes households with children who have completed their schooling. Hence, the estimates for government school usage discussed below include these 'high school dropouts'.

4.2 School usage

Our main measure of private school usage is based on households' expenditures on schools, which is reported for the 12 months preceding the interview. Expenditure on government and private school fees is provided separately in all surveys. Since private schools virtually always charge fees, the HES data are well suited to identify households with children attending a private school during the reference period. Government schools do not charge fees, although they often collect voluntary contributions and many households report positive government school expenditures.

The difference between the expenditure reference period and the time of the interview may cause some 'mismatch'. Over time, the children will grow older and they may have changed school type. The household composition may be different. Families may have formed or split. A separate issue is that some students do not live in the households that cover their school expenditures. We presume that these kinds of 'measurement error' are small and relatively constant over time.

4.3 High- and low-fee schools

The HES data files do not include detailed geographical information, so it is not possible to determine the range of school choices available to each household. However, by comparing total expenditures on private schools with family size, we can determine whether a household is using high- or low-fee private schools. It is important to consider primary and secondary schools separately, as the fees differ and it is common for households to combine government schools and private schools for children of different ages.

We construct a rough measure of average expenditure per student, separately for primary and secondary schools, as the household's weekly school expenditures divided by an estimate of the number of students attending. The estimate in the denominator is based on the number of persons aged 5–17(16) present at the time of the interview. This measure differs from the ideal in two aspects. First, the number of persons aged 5–17(16) at the time of the interview may not equal the number of students attending school during the 12 month reference period for school expenditure. Second, as we explain next, the

estimate of how many students attend primary and how many attend secondary school is crude. However, by using the same kind of information and the same methods in all years, we hope to minimise the impact of measurement error on the time patterns.[6]

To estimate the number of students, we assume that all persons aged 5–17(16) attend school. If there is expenditure on private schools, we assume that all relevant persons attend a private school. If there is expenditure on both primary and secondary private schools, we assume that half attend primary and the other half attend secondary school. Let c_{pt} and c_{st} denote the estimate of average expenditures per student for primary (p) and secondary (s) school in a given survey wave (t). Then

$$c_{pt} = \frac{e_{pt}}{n} \quad \text{and} \quad c_{st} = 0 \qquad \text{if } e_{pt} > 0 \text{ and } e_{st} \leq 0;$$

$$c_{pt} = 0 \quad \text{and} \quad c_{st} = \frac{e_{st}}{n} \qquad \text{if } e_{pt} \leq 0 \text{ and } e_{st} > 0;$$

$$c_{pt} = \frac{e_{pt}}{n/2} \quad \text{and} \quad c_{st} = \frac{e_{st}}{n/2} \qquad \text{if } e_{pt} > 0 \text{ and } e_{st} > 0,$$

where e_{jt} for $j = p, s$ is household expenditure on private primary or secondary schools, and n is the number of persons in the household aged 5–17(16).

To determine whether a household is using high- or low-fee private schools, we use a wave-specific threshold criterion: households are deemed to be using low-fee schools if $c_{jt} < \tau_{jt}$ and high-fee schools if $c_{jt} \geq \tau_{jt}$ for $j = p, s$.[7] For 2003/2004, the first year expenditures are provided separately for Government, Catholic and Independent schools in the HES data, we define the threshold between high- and low-fee schools at the 90th percentile of the distribution of the average expenditure per student for Catholic schools. This decision reflects the fact that there are some expensive elite Catholic schools, but most Catholic schools charge low fees. For the other waves, we define the threshold relative to the median of the wave-specific distribution of average expenditure per student. If m_{jt} denotes the median of the distribution in wave t, the thresholds are defined by $\tau_{pt} = 1.7148070\, m_{pt}$ and $\tau_{st} = 1.9997914\, m_{st}$. The scale factors are defined as the ratio, in

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[6]See Appendix B for analysis which uses the number of students attending government and non-government primary and secondary schools at the time of the interview.

[7]Note that our classification is based on average fees actually charged, net of e.g. sibling discounts, not the maximum fees officially listed by schools.

2003/2004, of the 90th percentile of the distribution of average expenditures for Catholic schools over the median of the distribution of estimated average expenditures.

Table 2 shows the distribution of school usage across households implied by this measure. Here and elsewhere 'Gov0' denotes households with children attending a government school or not attending school; 'Low' denotes households with children attending a low-fee private school; and 'High' denotes households with children attending a high-fee private school. The decreasing trend in the proportion of households who use government schools only is evident. The most common alternatives are the combinations of using low-fee primary schools and government secondary schools or government primary schools and low-fee private secondary schools. Over time, these combinations become prevalent. The proportion of households using both low-fee primary and secondary schools or combining government primary schools with high-fee private secondary schools is stable at about 2.0–3.6 per cent.

Since many combinations occur infrequently, we simplify the analysis by classifying households into three groups: those who use only government schools or do not use school at all; those who use some low-fee private schools but not any high-fee schools; and those who use any high-fee private schools. The three groups are labelled 'Gov*', 'Low*', and 'High*'.

4.4   Income

The main income concept adopted in the HES is 'usual cash income', which differs in several ways from total (annual) income used in other surveys. Usual cash income is gross receipt of recurring and usually regular cash flows. Thus irregular transfers, capital gains and losses, and most in-kind income are excluded. For this reason, one might expect usual cash income to be less variable than total income. The various income components may be based on different calendar time periods. For example, employee income is based on average weekly receipts over the previous 12 months, while business income refers to the previous financial year. We use equivalised real (total gross usual cash) income in our

analysis.[8] The income data are deflated by the consumer price index and measured in 1989/1990 prices.

4.5 Household composition

To summarise the trend towards single-parent households and smaller families, we focus on two household characteristics. First, we consider whether there is a spouse of the household reference person present in the household. Second, we consider counts of people in the age ranges 0–4, 5–14, 15–17(16), and 18(17)–99 years. In some cases the number of people is top-coded, and we have substituted a minimum number of people present in these cases.

4.6 Household background

The population of Australia has increased by about 80% since the mid-1970s and immigration, as an important contributor to that growth, may have also played a role in the increasing usage of private schools. The information about immigrant status and background in the HES data is limited and not consistently presented over time. We focus on whether the household reference person is born in Australia or in a foreign country. Unfortunately, the country of birth is aggregated by language in some years and geographic proximity in other years, and consequently we are unable to control for country of origin consistently in our analysis. A similar problem bedevils the time of arrival in Australia.

Our literature review identified religious affiliation as a potential important factor affecting private school attendance at any point in time. As a phenomenon whose incidence has decreased since the 1970s in Australia, it seems unlikely it could have contributed much to the growth in private school usage since then, but we are prevented from considering it because there is no information about religious affiliation in the HES data.

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[8]The OECD-modified equivalence scale is used, where the first adult counts 1.0, other adults 0.5 each, and children (under the age of 15) count 0.3.

4.7   Data limitations and comparability across surveys

The surveys are mostly comparable over time. While there have been numerous changes to the survey instruments and changes in the construction of sample weights, most of these have relatively minor effects on the present analysis. The following summarises the most important changes and limitations.

To protect the anonymity of the respondents, much information in the publicly available files are censored (e.g. grouped or top-coded) or 'perturbed'.[9] Unfortunately, the censoring scheme is not consistent across surveys and many of these changes make comparisons over time impossible. We have already mentioned that the number of household members and their ages are presented in age intervals and top-coded. The age intervals vary across surveys, and in 1988/1989 it is not possible to determine the number of people aged 17 or below versus people aged 18 or above. Also, the handling of the territories is inconsistent across surveys and we have omitted them from the analysis. For immigrants, their country of origin and their time of arrival are not available in comparable categories across survey waves. Generally, there is more detailed information available in recent waves, but our approach here is to base the analysis on measures that are consistent and comparable across all surveys.

We note that top-coding of the number of children in the household tends to overestimate average expenditure per student. As we are finding only modest changes in the usage of high-fee schools, we believe any resulting bias is small.

The first survey, conducted in 1975/1976, may be less representative of the Australian population. Siminsky, Saunders, and Bradbury (2003) compare estimates of gross per-capita income using ABS's expenditure surveys with estimates from the National Accounts. The HES estimate is of the order of 60% to 65% of the National Accounts estimate in all surveys, except for the 1975/1976 survey, when it was closer to 75%. They attribute this to unusually high wage and salary income and employment rates in that survey, and growth in non-labour sources of income in the National Accounts since that time.

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[9]The number of households with censored total number of persons is 93, 23, 6, 8, 0, 0, and 0 across waves, the number of households with censored age distribution is 96, 25, 6, 8, 48, 10, and 1 across waves. The ABS has perturbed the data in the recent waves, and the amount of censoring cannot be inferred from the data documentation.

In 2009/2010, an additional sample of metropolitan households whose main source of income was a government pension, benefit and/or allowance was added to the survey. Despite considerable effort, we are unable to determine whether or not this addition disproportionately increased the number of households who use only government schools. Unfortunately, the 'pensioner' sample is not separately identifiable in the publicly available files and cannot be removed. It is important for the interpretation of the empirical results to keep in mind that the 2009/2010 sample may be skewed towards relatively poorer households.

The 2015/2016 survey also oversampled people receiving government income support, using a different sampling methodology. Given the issues with the 2009/2010 data, we decided not to include the 2015/2016 data here.

5 Which households use private schools?

5.1 Multinomial logit models

We now examine the incidence of private school usage across households and the extent to which changes in household income and household composition over time have contributed to the shift towards private schooling. We focus on three alternatives: households who use government schools only or do not use schools (Gov*); households who use some low-fee schools but no high-fee schools (Low*); and households who use some high-fee schools and possibly also government or low-fee schools (High*). To relate the classification to household characteristics, we use multinomial logit models.

The household characteristics which we can control for the log of equivalised household income; an indicator of one- or two-parent family; an indicator of whether the household reference person is born outside Australia; counts of the number of persons in the household aged 0–4, 5–14, 15–17(16), and 18(17)–99; state indicators; and survey year indicators. To reduce the effect of outliers, we censor log income at the 1th and 99th percentiles. Table 3 shows summary statistics for the regression sample.

Our preferred model specification includes log income as a third-order polynomial;

the state indicators, the number of persons aged 0–4, and the number of persons aged 5–14 interacted with the wave indicators; and the indicator of two-parent families, the indicator of the reference person being born outside Australia, the number of persons aged 15–17(16), and the number of persons aged 18(17)–99 interacted with a linear time trend. Using likelihood-ratio tests, this model is not rejected against separate estimation for each year, while models with fewer wave-interactions are rejected against our preferred model.

5.2   Income

To show the role of income in school choice, we plot predicted probabilities that the average household uses government, low-fee private, or high-fee private schools against the log of equivalised real income. The predictions are computed by varying log income and keeping all other variables at their (overall across years) means. For the purposes of graphing, log income is varied between the 5th and 95th percentiles of the distribution for each year.

Figure 5 shows the probability that the average household does not use private schools. The incidence is decreasing in income in all years and decreasing across years for all income levels. The shift down is not parallel, with the decline somewhat greater at higher income levels. For example at weekly equivalised log income of 6.5, the change is around 20 percentage points, while it is around 12 percentage points at 5.5. Hence, the shift to the private school sector has been somewhat more prevalent, though by no means concentrated, in the upper part of the equivalised income distribution. This result is similar to Ryan and Watson's (2010) finding that the increase in attendance at private schools between the mid-1970s and 2003 was more prevalent in the top half of the social background distribution, as measured by parental SES.

Figure 6 shows the predicted probability that the average household uses a high-fee school (possibly alongside low-fee or government schools). The probability is negligible for low levels of income, but rises gradually for higher levels of income. Not surprisingly, it is the more affluent who use high-fee schools. The figure also shows that apparently there

were a general increase in usage of high-fee school usage between the mid-1970s and the mid-1980s, followed by a long and remarkably stable period before usage dropped back to the 1970s level in 2009/2010.

Figure 7 shows the predictions for households who use some low-fee but no high-fee private schools. The incidence is increasing slightly with income in all years, although perhaps tapering off for very high income levels in recent years. Looking across years, it appears that there was an increase in the incidence for all income levels in all years except between 1988/1989 and 1993/1994. The estimates suggest that most of the increase in enrolments at private schools since the mid-1970s has taken place in low-fee schools.

5.3 Household composition

There have been significant changes over time in the proportion of single-parent households, which has gone up, and in the number of children in each household, which has gone down. The effects of household composition have partly been taken into account in the previous analysis by using an equivalised household income measure. Nevertheless, it is useful to examine whether there are also direct effects of household composition.

Figure 8 shows predicted probabilities of using government schools only, using some low-fee but no high-fee private schools, and using some high-fee school for the average household with one or two parents. (All other variables are evaluated at their overall means.) We find that two-parent households are more likely to use private schools than single-parent households, and more likely to use both low-fee and high-fee schools. The movements across time are similar, with a decreasing trend until 2009/2010 for using government schools only, a flat trend for using some high-fee schools, and an increasing trend for using low-fee schools.

A closer look reveals that the differential use of private schools increases steadily until 2009/2010 where the estimates suggests a slight decrease. There is a small increase in the differential use of high-fee private schools after 1975/1976 and a small decrease before 2009/2010, but hardly any change in between these years. In contrast, the differential use of low-fee private schools increased steadily over the entire period. In other words,

two-parent households were increasingly more likely than single-parent households to use a low-fee school, and less likely to use no private school.

Regarding household size, please see the discussion in the working paper (Gørgens, Ryan, and Zhao, 2018). To summarise, over time larger households, those with two parents and more children, have become slightly more likely than smaller households to use private schools. This is after controlling for equivalised income. The shift is almost exclusively towards low-fee schools, as the probability of using high-fee private schools is virtually unaffected.

5.4 Foreign-born household reference persons

Figure 9 shows that households where the reference person is born outside Australia are less likely to use government schools and more likely to use low-fee private schools. However, the pattern is roughly the same in all years, so this is not an important factor in explaining the increasing usage of private schools in Australia. This is perhaps not surprising, given that the proportion of household reference persons born outside Australia has fairly constant at about 29–33 per cent over the entire period (see Table 3).

It is still possible that the immigrants' ethnic/cultural background may play a role, as the distribution of immigrants across origin countries has changed substantially over time. Unfortunately, the HES data files do not allow us to track origin countries or year of arrival consistently over time, nor is it possible to identify second-generation immigrant households.

5.5 Counterfactual calculations

In this section, we briefly discuss some counterfactual estimates obtained from the preferred model. First we ask how many households would have used private schools if the distribution of household characteristics (income, household composition, etc.) had remained constant throughout the entire period. The patterns in these predictions reflect changes in the model's parameters over time (as captured by the wave dummies and their interactions), and they can be interpreted as the effects of changes in access to private

schools, school quality, and household preferences. The results are omitted here (see Gørgens, Ryan, and Zhao, 2018), but the predictions track the actual outcomes reasonably well and, in particular, they are very close at both ends of the period. This suggest that parameter changes (as opposed to covariate changes) are responsible for most of the actual trends.

The second question we ask is how many households would have used private schools if the parameters of the model had been the same over time. The patterns in these predictions reflect the effects of changes in the covariates income, household structure and the like. The results (omitted) confirm that covariate changes on their own would have increased government school usage a bit during the middle of the period, with a return to early levels at the end of the period. The use of low-fee schools would have decreased significantly, and the use of high-fee schools would have increased over the entire period (especially in 2009/2010). The differences between predicted and actual outcomes are generally large, again suggesting that covariate changes account for only a small part of the trend.

These counterfactual predictions point to changes in factors not controlled in the model, such as access to private schools, fees, school quality, and household preferences, as the most important contributors to the trends in the usage of private schools apparent in the data. Income growth and smaller families play only a small part.

6   Discussion

This paper examines the increase in the use of private schooling that has occurred in Australia since the 1970s. In particular, we utilise the Household Expenditure Survey data, collected every six years or so, to look at the role of household income and demographics in the choice to use private schools and to assess the extent to which changes in household income, the rise of single-parent households, the fall in household size, and the role of immigration may have contributed to this trend.

We find that the growth in private school usage is concentrated on low-fee schools. The incidence of private school usage is higher in households with higher equivalised

income, in two-parent households, and in households with more children. Not surprisingly, high-fee schools are predominantly used by high-income households. Between the 1970s and 2009/2010, the incidence of private school usage increases for all income levels and for all household sizes. However, counterfactual calculations holding the distribution of household characteristics constant suggest that the net effect of income and demographic changes over the period is small. In particular, in the absence of changes in income and household characteristics even more households would have used private schools, at least during the 1980s and 1990s.

These results point to other factors being the main drivers of the trend towards private school usage. Ultimately, understanding this expansion requires 'general equilibrium' considerations of both the demand for and the supply of (high-fee and low-fee) private schooling. It is clear from other data sources that the number and geographic spread of Independent schools has grown, potentially providing access to private schooling for a larger share of Australian households. Also, total resources available in the private school sector have greatly increased (including relative to the government sector, see Figure 23 in Gonski, Boston, Greiner, Lawrence, Scales, and Tannock, 2011), both through higher fees and Government subsidies, and this may also play an important role.

The HES data are not informative about specific schools, and we can only speculate on how schools have spent these resources. Of course, there are a variety of stories that might explain how the incidence of private schooling increases at the same time as fees are increasing. For example, our findings are consistent with a supply-driven story where the funds are spent on upgrading the quality of the services provided (better teachers, better facilities, better approaches to learning). To the extent that this strategy is more successful than innovations in the government sector, or believed to be more successful, the relative (perceived) quality of private schools increases and households will be willing to pay more for private schooling.

However, it is also possible to tell a demand-driven story where preferences for private schooling increase in society for reasons not directly related to the education services provided by schools, perhaps in tandem with population growth through immigration or

an increase in religiousness or a change in other attitudes. Surveys of Australian social attitudes since the early 1970s available from the Australian Data Archive track general attitudes towards public and private schooling. While the questions are not consistently-worded, the surveys do hint at more positive attitudes in relation to the discipline and academic climates of private schools relative to public ones over this time period among the Australian public. Further, more considered scrutiny of these sources of information might be valuable in understanding changes in attitudes in the Australian population towards different types of schools.

In addition, examining the increase in private schooling from the point of view of the schools and in changes in the services offered are interesting topics for further research. The main difficulty is that, as far as we are aware, there are no relevant systematic data collections that cover the full period.

A   Data sources

The enrolment numbers quoted in the Sections 1 and 3 and in Figures 1 and 2 come from the ABS *Schools, Australia* series.

The funding amounts presented in Figures 3 and 4 come from a consistent average school income series constructed by the Commonwealth Department of Education since the 1970s and published in various reports released by government agencies over time, most recently in the *National Report on Schooling in Australia* published by the Australian Curriculum and Assessment Reporting Authority. Where numbers for some years were not published, these were provided to the authors in personal communications with the Department.

All remaining numbers are the authors' calculations based on the ABS *Household Expenditure Survey, Australia* confidentialised unit record files (CURF).

B Alternative measure of average expenditures

From 1993/1994 there is information about the number of students in the household attending government and non-government primary and secondary schools at the time of the interview. Due to severe top-coding, the data for 1993/1994 are not useable.[10] For 1998/1999, 2003/2004 and 2009/2010, we use this information to construct an alternative measure of average expenditure. While less crude than our main estimate, the alternative measure is not perfect for the reasons mentioned in Section 4.2. For estimation, we further restrict the sample to households with students present at the time of the interview.[11]

The results are omitted. When we construct figures similar to those presented here, the predictions are not exactly the same across the two measures, but the time series patterns are quite similar. We conclude that our estimates are robust in this respect.

References

Committee, K. (1973). Schools in Australia. Report of the Interim Committee for the Australian Schools Commission, Australian Government, Canberra.

Dearden, L., C. Ryan, and L. Sibieta (2011). What determines private school choice? A comparison between the United Kingdom and Australia. *Australian Economic Review 44*, 308–320.

Dynarski, S., J. Gruber, and D. Li (2009). Cheaper by the dozen: Using sibling discounts at Catholic schools to estimate the price elasticity of private school attendance. NBER Working Paper 15461, National Bureau of Economic Research, Melbourne.

Gonski, D., K. Boston, K. Greiner, C. Lawrence, B. Scales, and P. Tannock (2011). *Review*

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[10] In 1993/1994 the numbers are top-coded at 'one or more'. As a result, the amount of censoring is about 35% for households with children attending non-government primary schools and about 53% for households with children attending non-government secondary schools.

[11] The alternative measure results in a slightly different overall distribution across Gov*, Low* and High*. The sample restriction eliminates households with school-aged children but no students, so the proportion of Gov* falls by about 1.5 percentage points (weighted) for the three waves combined. However, using the number of students present at the interview in the denominator instead of the crude estimate moves about 3 percentage points (weighted) back from Low* to Gov*. Overall, across the three waves of data about 4.7 percent of households (weighted) in the restricted sample change classification.

of Funding for Schooling, Final Report. Canberra: Australian Government Department of Education and Training.

Gørgens, T., C. Ryan, and G. Zhao (2018). Private school usage in Australia 1975–2010: Evidence from the Household Expenditure Surveys. ANU Working Papers in Economics and Econometrics #664, Australian National University.

Graetz, B. (1990). Private schools and educational attainment: Cohort and generational effects. *Australian Journal of Education 34*, 174–191.

Independent Schools Council of Australia (2017). Independent schooling in Australia 2017 snapshot. Online publication.

Le, A. T. and P. Miller (2002). Choice of school in Australia: Determinants and consequences. *Australian Economic Review 36*(1), 55–78.

Mavisakalyan, A. (2009). The impact of immigation on school choice: Evidence from Australia. PhD dissertation, University of Sydney, Sydney.

Neal, D. (1997). The effect of Catholic secondary schooling on educational achievement. *Journal of Labor Economics 15*(1), 98–123.

Peltzman, S. (1973). The effect of government subsidies-in-kind on private expenditures: The case of higher education. *Journal of Political Economy 81*(1), 1–27.

Ryan, C. and L. Watson (2009). The impact of school choice on students' university entrance rank scores in Australia. Paper presented at the School Choice and School Improvement conference, October 2009, organized by the National Center on School Choice, Vanderbilt University, Nashville.

Ryan, C. and L. Watson (2010). Choosers and losers: The impact of government subsidies on Australian secondary schools. *Australian Journal of Education 54*(1), 86–107.

Siminsky, P., P. Saunders, and B. Bradbury (2003). Reviewing the intertemporal consistency of ABS household income data through comparisons with external aggregates. *Australian Economic Review 36*(3), 333–249.

Vella, F. (1999). Do Catholic schools make a difference? Evidence from Australia. *Journal of Human Resources 34*, 208–224.

Watson, L. (2004). The total operating resources of Australian private schools in 2004.

Lifelong Learning Network Discussion Paper 4, Canberra.

Williams, R. (1985). The economic determinants of private schooling in Australia. *Economic Record 61*, 622–628.

Table 1: Sample overview

	75/76	84	88/89	93/94	98/99	03/04	09/10
Number of households (unweighted)							
Total sample	5543	4492	7225	8389	6892	6957	9774
Regression sample	2030	1423	2045	2112	1851	1687	1906
Per cent of total sample (unweighted)							
Regression sample	36.6	31.7	28.3	25.2	26.9	24.3	19.5
Per cent of total sample (weighted)							
Regression sample	37.0	32.9	30.2	26.1	27.0	26.7	24.6

Table 2: Estimates of household school usage

Primary	Secondary	75/76	84	88/89	93/94	98/99	03/04	09/10
Proportion of households by usage (column sum 100%)								
Gov0	Gov0	79.3	76.3	73.3	73.8	70.6	68.1	68.3
Gov0	High	3.3	2.8	2.9	3.7	3.3	3.5	3.3
Gov0	Low	4.1	5.7	7.6	7.7	9.2	9.6	11.9
High	Gov0	1.8	2.7	2.3	2.2	2.9	3.7	3.4
High	High	0.7	0.7	0.7	0.5	0.4	0.5	0.5
High	Low	0.7	0.4	0.8	0.8	1.0	1.1	0.5
Low	Gov0	7.9	8.4	9.3	8.6	9.1	9.9	9.7
Low	High	0.1	0.2	0.2	0.2	0.4	0.5	0.3
Low	Low	2.1	2.8	2.8	2.6	3.2	3.1	2.0
Proportion of households by usage (column sum 100%)								
	Gov*	79.3	76.3	73.3	73.8	70.6	68.1	68.3
	Low*	14.1	16.8	19.7	18.9	21.4	22.6	23.7
	High*	6.6	6.9	7.0	7.3	7.9	9.3	8.0

Weighted data.

Table 3: Regression sample summary statistics

	75/76	84	88/89	93/94	98/99	03/04	09/10
State (column sum 100%)							
NSW	36.2	34.2	35.1	35.6	34.3	34.8	33.3
VIC	29.1	27.0	26.6	24.8	25.1	25.0	24.2
QLD	14.3	17.1	16.2	18.5	20.1	19.5	21.5
SA	8.5	8.9	8.0	7.3	7.6	7.6	7.7
WA	8.4	9.3	11.3	11.0	9.9	10.4	10.9
TAS	3.6	3.4	2.9	2.8	2.9	2.7	2.4
Household head country of birth (column sum 100%)							
Born in Australia	69.8	68.9	66.8	69.0	71.3	70.6	70.2
Foreign born	30.2	31.1	33.2	31.0	28.7	29.4	29.8
Spouse of household head (column sum 100%)							
No spouse	12.5	15.7	16.1	20.8	21.2	21.6	21.7
Spouse	87.5	84.3	83.9	79.2	78.8	78.4	78.3
Minimum number of persons (mean)							
Aged 0–4	0.4	0.3	0.3	0.4	0.3	0.3	0.3
Aged 5–14	1.6	1.5	1.5	1.4	1.3	1.3	1.3
Aged 15-17(16)	0.4	0.4	0.3	0.4	0.4	0.4	0.4
Aged 18(17)–99	2.2	2.1	2.2	2.0	2.1	2.1	2.1
Equivalised real weekly household income (mean)							
89/90 dollars	397.0	341.5	360.6	341.8	385.4	440.2	550.8

Weighted data.
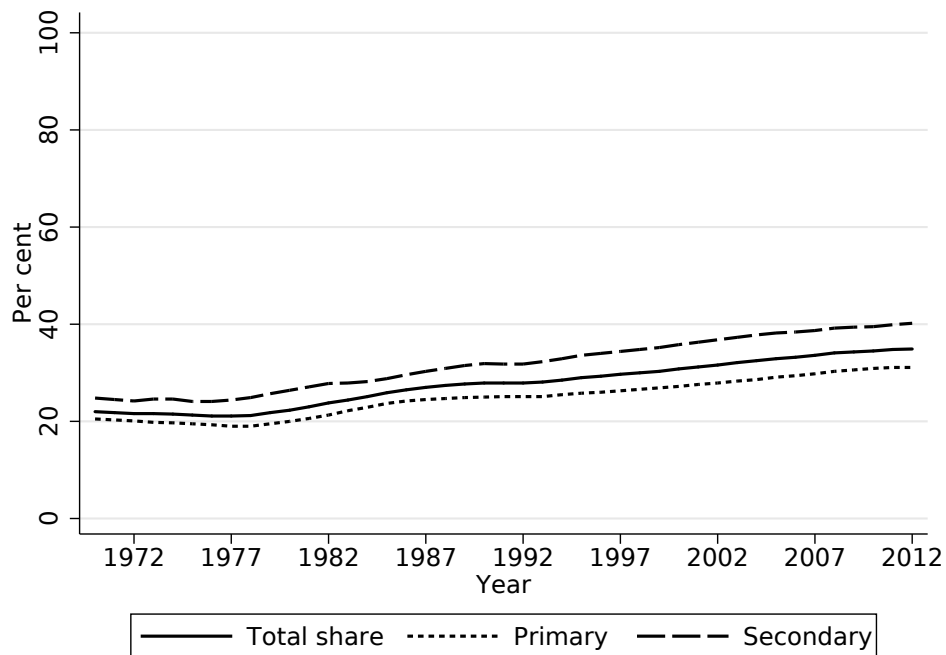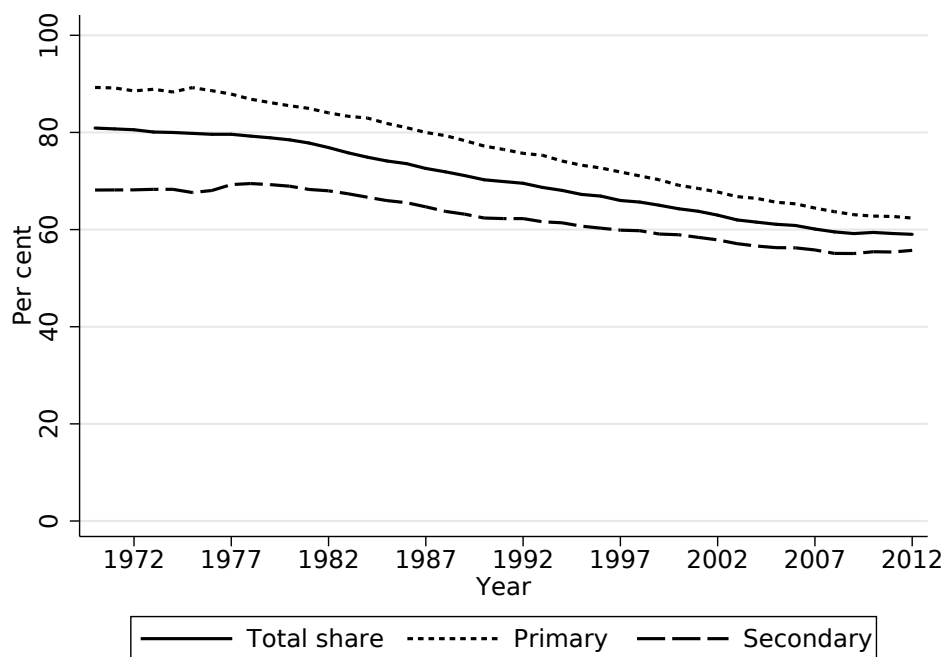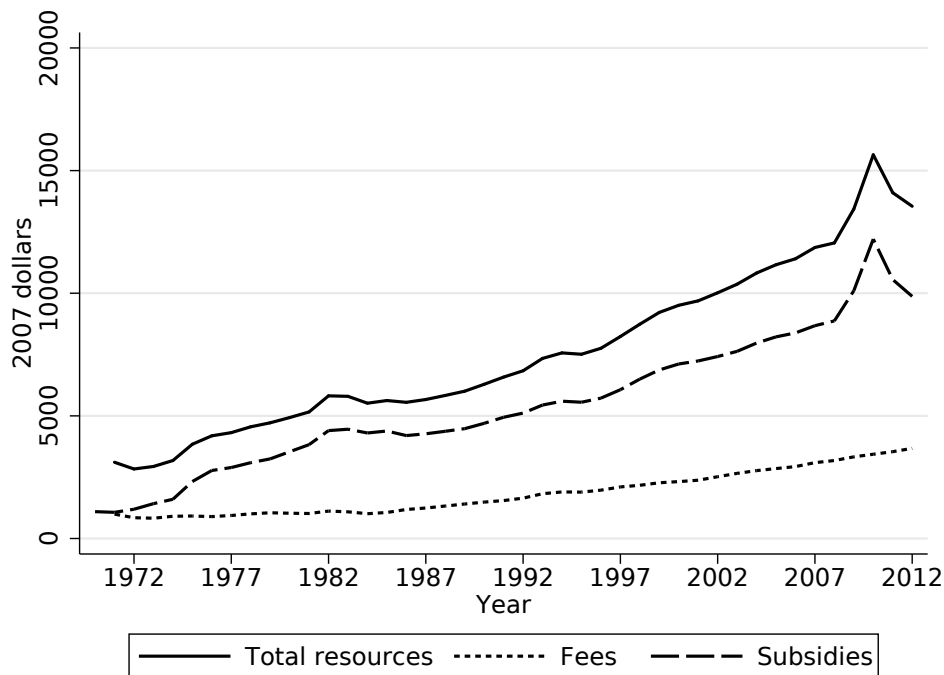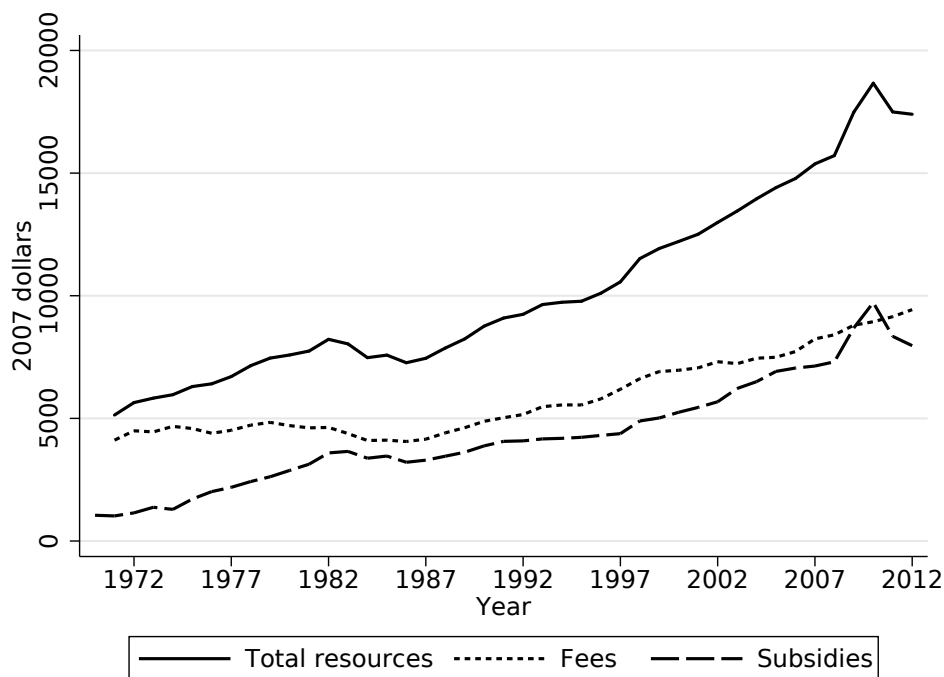
Figure 1: Private school student enrolment share

Figure 2: Catholic share of private school enrolments

Note: Numbers for 2008–2012 predicted based on totals for primary and secondary schools and enrolment shares.

Figure 3: Catholic secondary school per-student resources

Note: Numbers for 2008–2012 predicted based on totals for primary and secondary schools and enrolment shares.

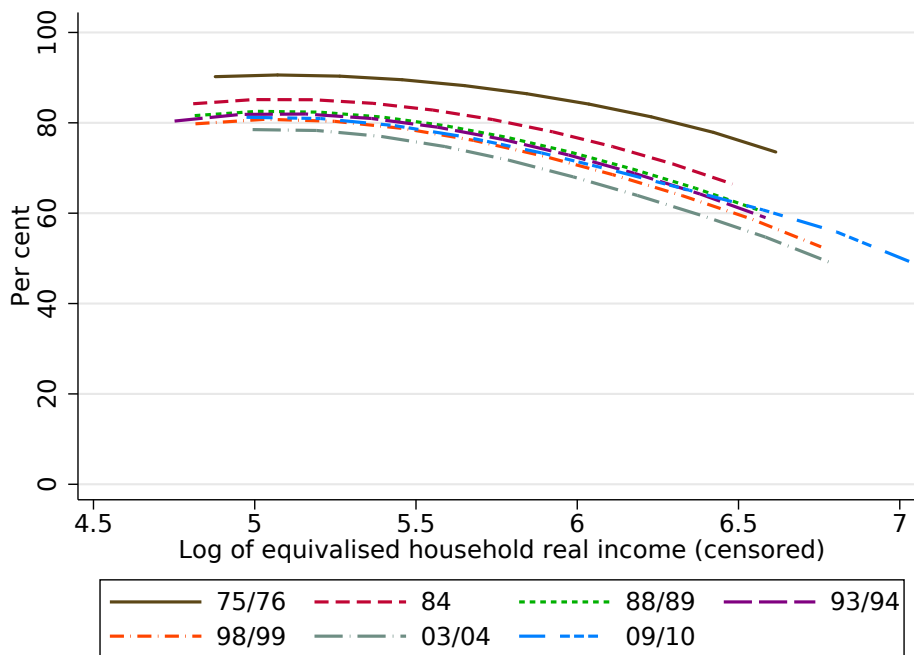Figure 4: Independent secondary school per-student resources

Figure 5: Predicted proportion of households using no private school
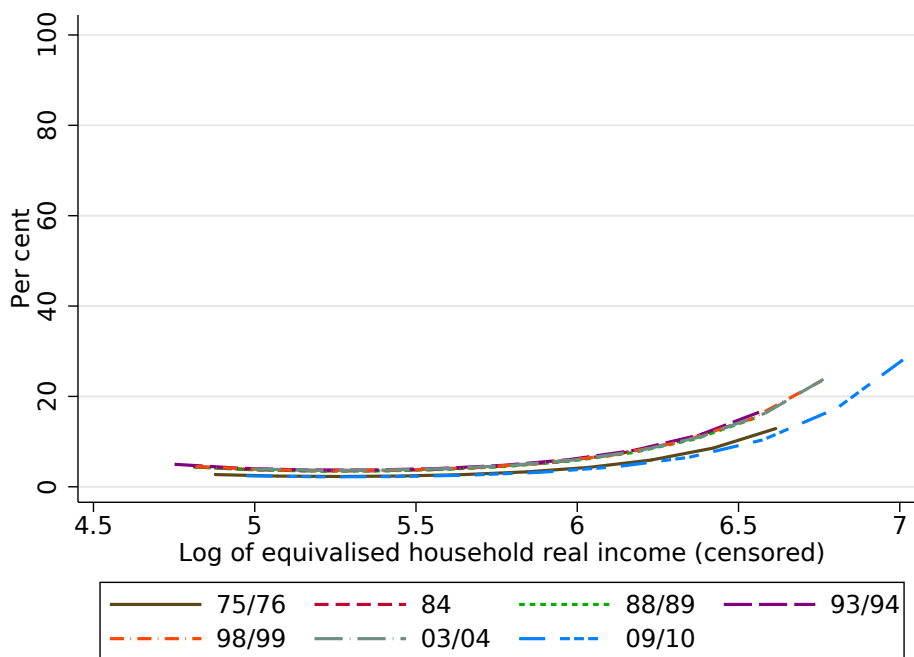
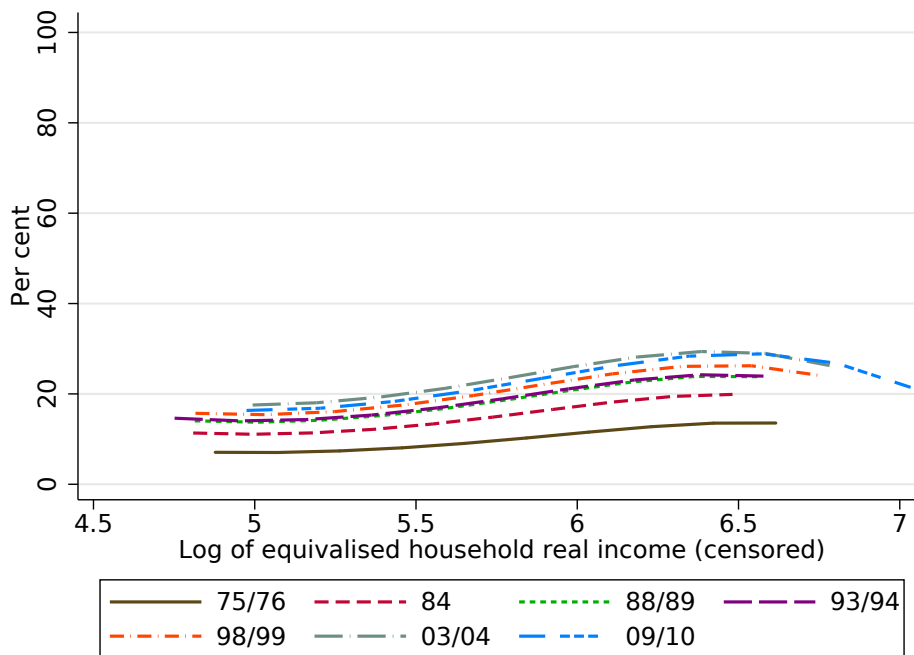Figure 6: Predicted proportion of households using any high-fee private school
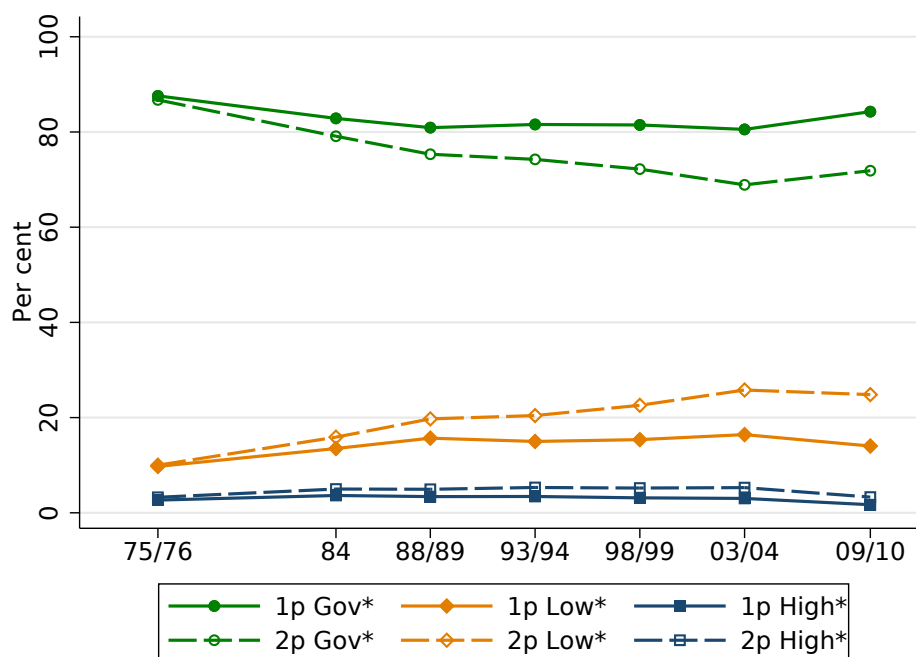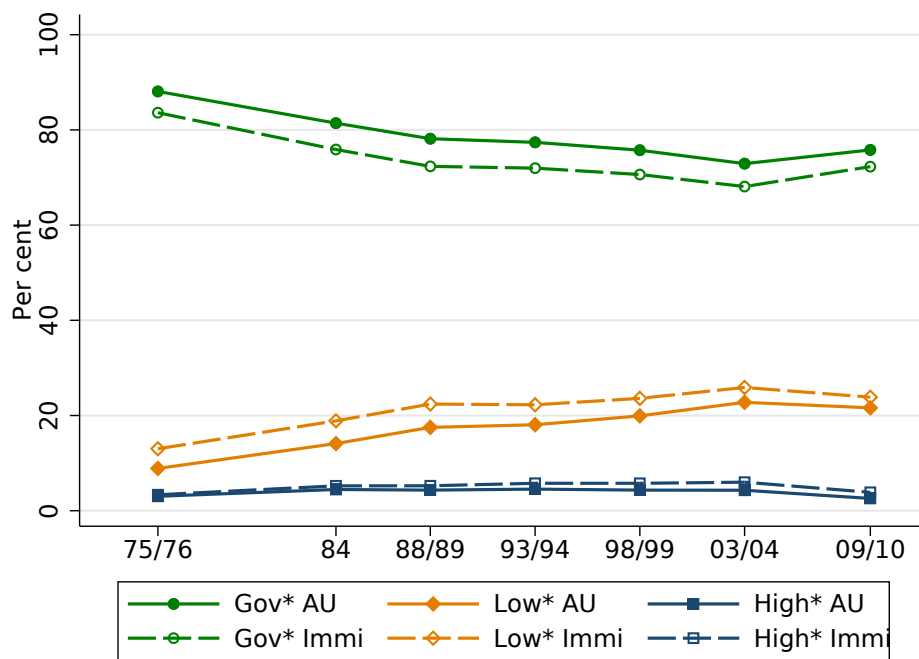
Figure 7: Predicted proportion of households using some low-fee but no high-fee private school

1p: one-parent households; 2p: two-parent households.

Figure 8: Predicted proportions for one- and two-parent households

AU: born in Australia; Immi: foreign born.

Figure 9: Predicted proportions for Australian and foreign born household heads