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

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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. This paper shows that most of the growth has been concentrated in using low-fee schools, while the growth in using high-fee schools has been modest. Furthermore, the increase has occurred for both two-parent and single-parent households and for households at all income levels. However, increasing income and changes household composition can account only for a small part of the trend.

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

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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. 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, in part because of perceived and actual changes in relative quality between the school sectors. 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), where the trend towards private school usage is reflected in growth in the proportion of households with positive expenditure on private school fees. The HES have been carried out by the Australian Bureau of Statistics (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 key factors, notably the role of income and demographic changes. 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 estimate 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.

In Australia, it is not uncommon for the same household at any point in time to use government schools for some children and private schools for others (and to switch sectors for any single child over time). For simplicity, we classify the households we observe at single points of time into three groups: those having no expenditure on private schools, those having any expenditure on high-fee schools, and those on having expenditure on low-fee but not on high-fee schools. We use multinomial logit models to study the role household income and household composition.

Overall, the data show that the gradual decrease in the use of government schools over the period is reflected in a large increase in the use of low-fee private schools, while the incidence of using high-fee private schools increases only slightly. This pattern suggests that the above-mentioned growth in the Independent sector is concentrated on schools charging low fees.

Regarding income, we find that the incidence of using private schools is not only increasing with equivalised income in all years, but generally also increasing for all income levels in all years, except in the last year 2009/2010 when the estimates suggest the use of private schools dropped back to the level of 1988/1989. As a result, the shift to the private school sector has been somewhat more prevalent, though by no means concentrated, in the upper part of the income distribution. The incidence of having some high-fee school expenditure among households is low for low levels of income, but rises gradually for higher levels of income. Not surprisingly, it is the more affluent households who use high-fee schools. Over time, the relationship between income and the use of high-fee schools increased between 1975/1976 and 1984, then remained remarkably stable until 2009/2010, when the data suggest it dropped back to the 1975/1976 level. The incidence of households using low-fee schools (but not high-fee schools) is gently rising with income in all years, although perhaps tapering off or even declining for very high income levels in the more recent years, consistent with high-income households preferring high-fee schools. Where the usage of high-fee schools is quite stable, the use of low-fee schools generally

increases every year for all income levels and accounts for most of the decrease in the use of government schools.

Regarding household composition, we find that two-parent households are more likely to use private schools than single-parent households, even when controlling for equivalised income, and more likely to use both low-fee and high-fee schools. The overall time patterns are very 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. Looking more closely, we find that the difference in the use of private schools between two-parent and single-parent households increases steadily until 2009/2010 where the estimates suggests a slight decrease. The trend in the differential use of high-fee schools is flat except for the slight increase in 1975/1976 and the slight decrease in 2009/2010. The overall trend is therefore reflected in the differential use of low-fee schools. In other words, two-parent households were increasingly more likely than single-parent households to use a low-fee school.

Household with more children are slightly less likely to use government schools and slightly more likely to use low-fee private schools. The number of children hardly affects the probability of using high-fee schools. The pattern is largely stable over the period, although there is a slight tendency for larger families to be increasingly more likely to use private schools.

Broadly, 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 and for both two-parent and single-parent households. Since Catholic school enrolments increased by only a small amount over this period, this means that this growth was concentrated among low-fee schools in the Independent school sector.

To examine the contribution of income growth and changes in household composition to the trend towards private schooling, we complement the analysis with some counterfactual 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 and in perceptions of school quality.

The paper is organised as follows. Section 2 provides a brief summary of related international and Australian literature. 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) analyse 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 factors that might pick up differences in the preferences of households.

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. Epple and Romano (1998) show that when there are peer effects in education, private schools have an incentive to vary tuition to attract relatively able students. Their theoretical model predicts that attendance at private schools will increase with income and ability, with the highest-ability and highest-income students in the top private school. Within schools however, there should be a negative relationship between school fees and ability.

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 the US, for example, Figlio and Stone (2001) and Epple, Figlio, and Romano (2004) find that income has a positive impact on private school enrolment, while Vandenberghe and Robin (2004) and West and Woessmann (2008) find that private school enrolment increases with SES, and Lankford and Wyckoff (2001) and Fairlie and Resch (2002) find positive effects of both income and parental education. Dearden, Ryan, and Sibieta (2011) for the UK and Davies and Aurini (2011) for Canada find that attendance at private schools increases with income.

Studies that provide evidence on how responsive private school enrolment rates are to tuition fees are less common. Dynarski, Gruber, and Li (2009) review this literature and point to US studies that contain price elasticity estimates that range from positive (Eriksen, 1982) to negative (Keeler and Kriesel, 1994; Lankford and Wyckoff, 1992; Chiswick and Koutroumanes, 1996), with other estimates not significantly different from zero (Buddin, Cordes, and Kirby, 1998) and one study that contains both positive and negative estimates (Long and Toma, 1988). Dynarski, Gruber, and Li themselves also find the price effect can vary from positive to negative, but argue that when the equation is properly specified and the price effect identified through local variation in tuition charges, the price elasticity is small but negative. To identify the elasticity, they exploit variation

in per-student fees due to sibling discounts. Blundell, Dearden, and Sibieta (2010) find the price elasticity is also small and negative in the United Kingdom. Their empirical approach is quite different, using regional enrolment, fee and school achievement data over time. They find private school enrolment shares decline with increased fees and improved quality of public school offerings, as reflected in average public school achievement in regions.

Studies have examined a host of other factors that affect private school enrolment, generally interpreted as affecting the preferences of households in some way. These factors include the religious affiliation of households and their religiousness (Neal, 1997; Sander, 1999; Cohen-Zada and Sander, 2008; Evans and Schwab, 1995); family structure, including number of siblings, which may also affect affordability (Neal, 1997; West and Woessmann, 2008; Cohen-Zada and Sander, 2008; Dynarski, Gruber, and Li, 2009); race (Cohen-Zada and Sander, 2008; Fairlie and Resch, 2002); and motivations about the type of peers a household's child will have (Fairlie and Resch, 2002; Epple, Figlio, and Romano, 2004; Hsieh and Urquiola, 2006).

Burgess, Greaves, Vignoles, and Wilson (2015) analyse the choices families in England make on which primary schools to send their children to in England from among schools close to their home. They conclude that most families in England have strong preferences for schools' academic performance, while also valuing higher school socio-economic composition and closer proximity. Differences in school quality were generally not valued differently across socio-economic groups.

Australian studies of the incidence of private school usage mirror the focus of many of the US studies. For example, 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 affect 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 public schools was almost constant across the income distribution.

The influence of non-economic factors have also been studied. 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 effect for religiousness on attendance at private schools; Le and Miller (2002) find that as the number of siblings in a family increase, the incidence of attending a Catholic school rises and the incidence of attending an Independent school fall; 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 induces '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 lower fees, and this had indeed tended to induce quality-sensitive high-SES students into the private school system.

3 Australian schools

3.1 Three sectors

The public school system in Australia is administered at the state government level, so 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 a mass system of both primary and secondary schools across the nation, 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. While common until the 1970s, mainstream teaching roles for members of religious orders in Catholic schools have all but disappeared.

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 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, which is an acceleration of a longer-term shift in the private 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 voucher for all students to attend the school of their choice in the private sector. 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 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.

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.[1]

[1]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 HES data are produced by the Australian Bureau of Statistics (ABS). 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 of practicality, this study examines waves 1975/1976 through 2009/2010.[2]

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 1998/1999 survey onwards. Mainly the data files have information about the number 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.[3]

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.[4]

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. Conse-

[2]We do not use the final survey or try to explain why the private sector enrolment share might have been largely unchanged since 2013 because our focus is on explaining the long-term trends apparent since the 1970s.

[3]The number of people in each age range is top-coded in some cases.

[4]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'.

quently, 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.

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 are 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.[5]

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 specific types of school during the 12 month reference period for school expenditure. Second, as

[5]It is not appropriate to take zero expenditure as an indication that no children attended a government school during the reference period, so these data are not informative about school enrolment.

we explain next, the estimate of how many students attend primary and how many attend secondary school is crude.

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 (EAE) per student for primary (p) and secondary (s) school in a given survey wave (t). Then

$$\begin{aligned} c_{pt} &= \frac{e_{pt}}{n} \quad \text{and} \quad c_{st} = 0 \qquad \text{if } e_{pt} > 0 \text{ and } e_{st} \leq 0; \\ c_{pt} &= 0 \qquad \text{and} \quad c_{st} = \frac{e_{st}}{n} \quad \text{if } e_{pt} \leq 0 \text{ and } e_{st} > 0; \\ c_{pt} &= \frac{e_{pt}}{n/2} \quad \text{and} \quad c_{st} = \frac{e_{st}}{n/2} \quad \text{if } e_{pt} > 0 \text{ and } e_{st} > 0, \end{aligned} \tag{1}$$

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 $j = p, s$. For 2003/2004, 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 2003/2004, of the 90th percentile of the distribution of average expenditures for Catholic schools over the median of the distribution of the EAE.

Table 2 shows the distribution of school usage across households implied by this measure. Here and elsewhere 'Gov' 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 either primary or secondary high-fee private schools, or both. 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 capital 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 refer to the previous financial year. We use equivalised real total gross income in our analysis.[6] The income data are deflated by the consumer price index and measured in 1989/1990 prices.

[6]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.

4.5 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 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 limitation.

To protect the anonymity of the respondents, much information in the publicly available files are censored (e.g. grouped or top-coded) or 'perturbed'. 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 greatly 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. In addition, 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. 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.

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 Ac-

counts. 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.

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. It is unclear 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.

5 Which households use private schools?

5.1 Multinomial logit models

We are now ready to 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.

As mentioned, 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 consistently across the years are limited. We include the log of equivalised household income; an indicator of one- or two-parent family; counts of the number of persons in the household aged 0–4, 5–14, 15–17(16), and 18(17)–99; the household reference person's age and immigrant status; 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 includes log income as a third-order polynomial and interactions

between the wave indicators and state indicators, the number of persons aged 0–4, and the number of persons aged 5–14. Using a likelihood-ratio test, this model is not rejected against separate estimation for each year, while a more restrictive model is rejected against our preferred model. The more restrictive model only has interactions between the wave and state indicators. As it turns out, however, predictions derived from the preferred and the more parsimonious model are quite similar.

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-1980s 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.

The effect of the number of children in the household varies with the age of the children. Figures 9–12 show predicted probabilities for different numbers of people of a given age in the otherwise average household. In Figure 9, the comparison is between a household with zero or one child aged 0–4. In 1975/1976 and 1984, households with one child were slightly less likely to use government schools and more likely to use low-fee private schools. After 1988/1989, there are hardly any differences. Since 0–4-year-olds do not themselves attend school, it is possible that the differences in the 1970s and early 1980s reflect household heterogeneity. One story is that Catholic households were both more likely to include preschool children, as they tended to be larger, and more likely to use low-fee (Catholic) schools for their older children. Over time, perhaps the Catholic and non-Catholic household sizes converged.

Figures 10 and 11 show that households with more children aged 5–14 or 15–17(16) years are more likely to use low-fee private schools and less likely to use government schools, while family size does not affect the probability of using high-fee private schools. An additional child aged 5–14 years decreases the probability the average household uses government schools only by a little less than four percentage points in the early period and a little more in the later period. The partial effect of an additional child aged 15–17(16) years is about three percentage points in 1975/1976 and increases gradually to about five percentage points in 2009/2010.

Finally, Figure 12 shows that the number of persons aged 18(17)–99 has no effect whatsoever on households' school choice, when we control for the number of parents in the household.

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 Counterfactual calculations

In this section, we present 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.

Figure 13 shows the proportions of household using government schools only, low-fee private schools, or high-fee private schools (solid lines) in the regression sample, as well as prediction proportions for the observed values of covariates holding the covariates constant at the 1975/1976 or 2009/2010 values (dashed lines).[7] The shape of the predicted curves are similar for other years. Since the model fits very well, the predicted and the actual curves are quite close in the year corresponding to the fixed covariates. The predicted curves track the actual reasonably well and, in particular, they are very close at both ends of the period. This suggest that covariate changes do not are not responsible for much of the actual trends. The gaps between predicted and actual suggest that covariate changes have resulted in more households using government schools during the middle of the period. That is, changes in income and household composition actually pulled against the main trend towards higher private school usage. Nonetheless, covariate changes may have been responsible for a small shift from low-fee to high-fee schools.

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, etc.

Figure 14 shows the proportions of household using government schools only, low-fee private schools, or high-fee private schools (solid lines) in the regression sample, as well as prediction proportions for the observed values of covariates holding estimated

[7] The regression estimates are unweighted, while the sample proportions and the predicted proportions are all weighted using the wave-specific HES sample weights.

parameters constant at the 1975/1976 or 2009/2010 values (dashed lines). Again, the shape of predicted curves is similar if the parameters are held constant for other years, but they would meet the actual near the year corresponding to the fixed parameters.

The figure confirms that covariate changes on their own would have increased government school usage during the middle of the period, with a return to early levels at the end of the period. The use low-fee schools would have decreased significantly, and the use of high-fee schools would have increased slightly over the entire period. The gaps between predicted and actual are generally much larger in Figure 14 than in Figure 13, suggesting that that covariate changes account for only a small part of the trend.

The 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. 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 Australian Household 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, and the fall in household size 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. It is clear from other data sources that the number 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 has greatly increased, 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. Research on these matters is likely to rely on evidence from very diverse sources. Over time, however, analysis of suitable data from the *My School* website will allow student flows between schools in neighbourhoods and regions to be tracked to see the extent to which they follow changes in relative school resources, student composition and achievement, which will begin to paint a more precise picture of how school quality matters in Australian schooling.

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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 in scope (unweighted)							
Regression sample	36.6	31.7	28.3	25.2	26.9	24.3	19.5
Per cent in scope (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%)								
Gov	Gov	79.3	76.0	73.4	73.7	70.6	68.0	68.1
Gov	High	3.3	2.8	2.9	3.6	3.2	3.5	3.3
Gov	Low	4.1	5.8	7.6	7.7	9.2	9.6	12.0
High	Gov	1.8	2.8	2.3	2.3	2.9	3.7	3.3
High	High	0.7	0.7	0.7	0.5	0.4	0.5	0.5
High	Low	0.7	0.5	0.8	0.8	1.0	1.1	0.5
Low	Gov	7.9	8.4	9.3	8.5	9.2	10.0	9.9
Low	High	0.1	0.2	0.2	0.2	0.4	0.5	0.3
Low	Low	2.1	2.7	2.8	2.7	3.2	3.1	2.0
Proportion of households by usage (column sum 100%)								
Gov*		79.3	76.0	73.4	73.7	70.6	68.0	68.1
Low*		14.1	16.9	19.7	18.9	21.5	22.7	23.9
High*		6.6	7.0	6.9	7.4	7.9	9.3	8.0

Weighted data. Northern Territory and the Australian Capital Territory included.

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
Age of household head (column sum 100%)							
Less than 20	0.4	0.4	0.1	0.2	0.4	0.2	0.0
20–24 year	1.1	1.2	1.0	0.8	1.4	1.0	0.6
25–29 year	7.7	6.4	6.0	5.0	6.2	3.9	4.1
30–34 year	18.0	17.8	14.4	16.6	13.2	11.8	7.9
35–39 year	22.2	24.7	26.3	25.7	24.3	22.7	20.7
40–44 year	17.3	23.1	27.8	25.5	26.4	27.3	25.5
45–49 year	17.5	13.2	14.0	17.4	17.5	18.9	22.1
50–54 year	8.3	6.3	6.6	6.4	7.2	9.7	11.2
55–59 year	4.2	4.3	1.9	1.4	2.3	3.2	4.9
60–64 year	1.9	1.5	0.9	0.4	0.7	0.9	1.5
65 years and over	1.4	1.1	0.9	0.4	0.5	0.5	1.4
Age of household head (column sum 100%)							
Younger than 45	66.7	73.6	75.6	73.9	71.8	66.9	58.9
Older than 44	33.3	26.4	24.4	26.1	28.2	33.1	41.1
Household head arrival in Australia (column sum 100%)							
Born in Australia	69.8	68.9	66.8	69.0	71.3	70.6	70.2
Arrived late[a]	9.7	10.9	16.6	14.1	13.4	13.3	17.6
Arrived early[a]	20.5	20.2	16.6	16.9	15.2	16.0	12.2
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

Weighed data. [a]The threshold for late/early is 10 years ago in 1975/1976, 15 years in 1984, 19/20 years in 1988/1989, 18/19 years in 1993/1994 and 2003/2004, and 24/25 years ago in 2009/2010.

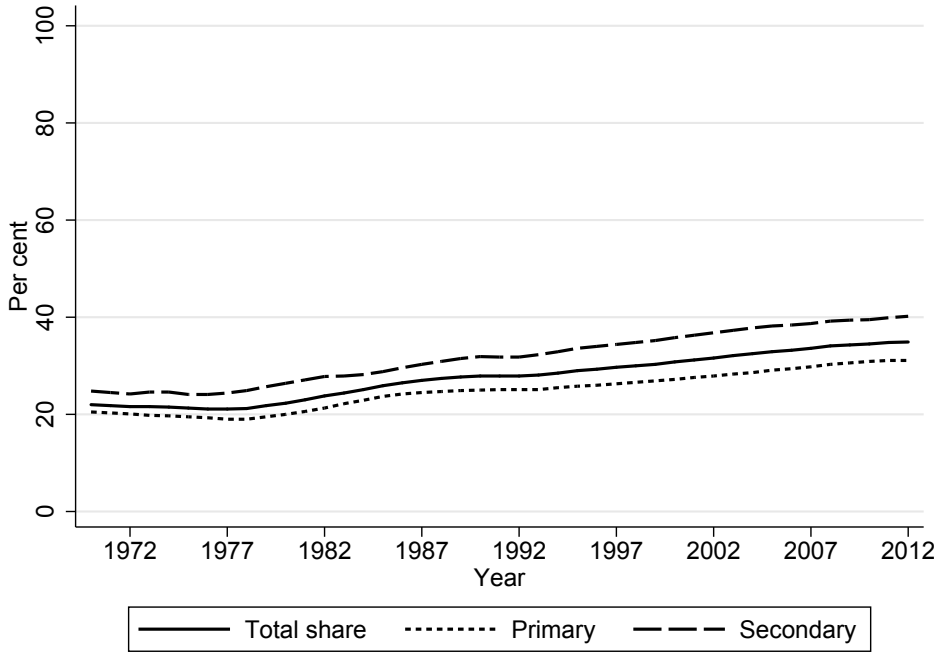


Figure 1: Private school student enrolment share

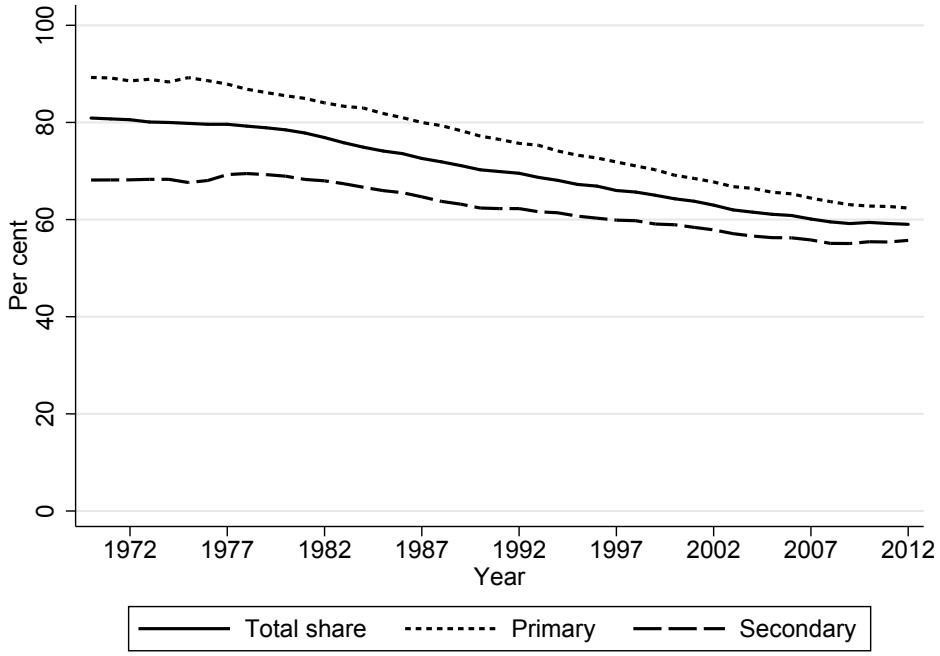
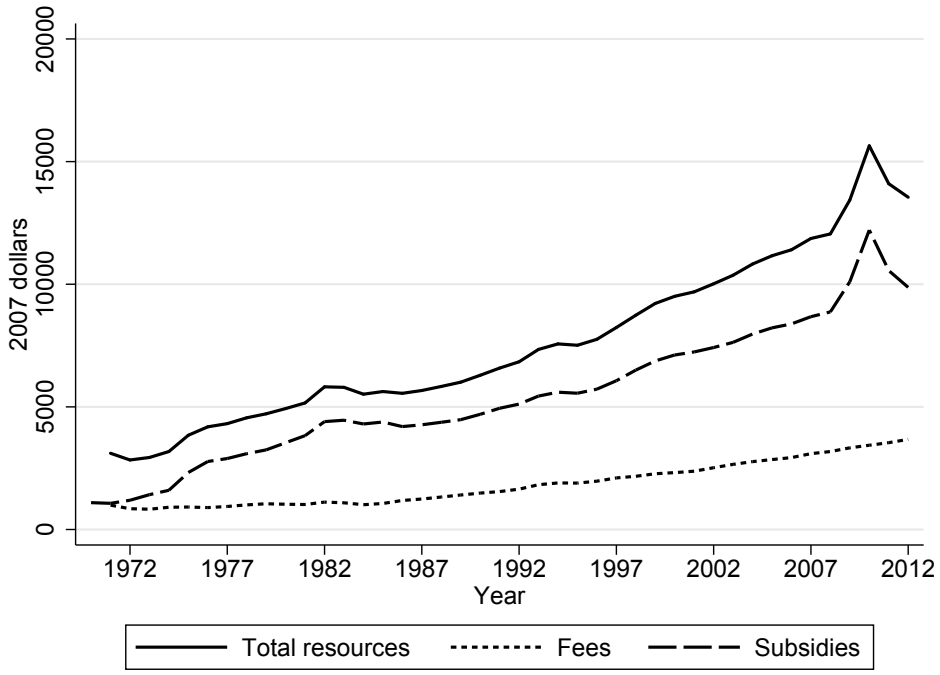
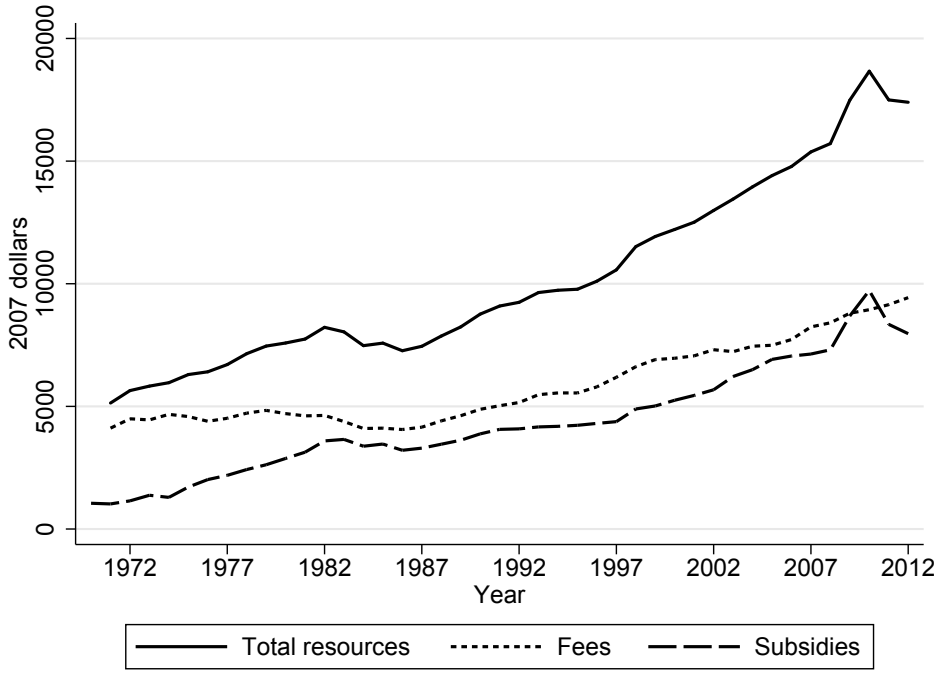


Figure 2: Catholic share of private school enrolments



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

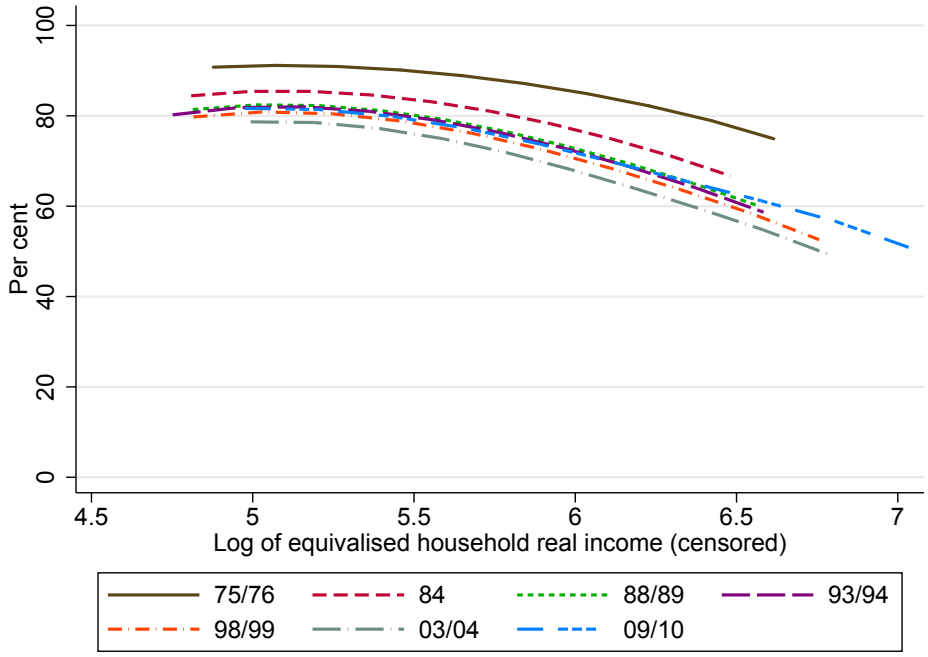


Figure 5: Predicted proportion of households using no private school

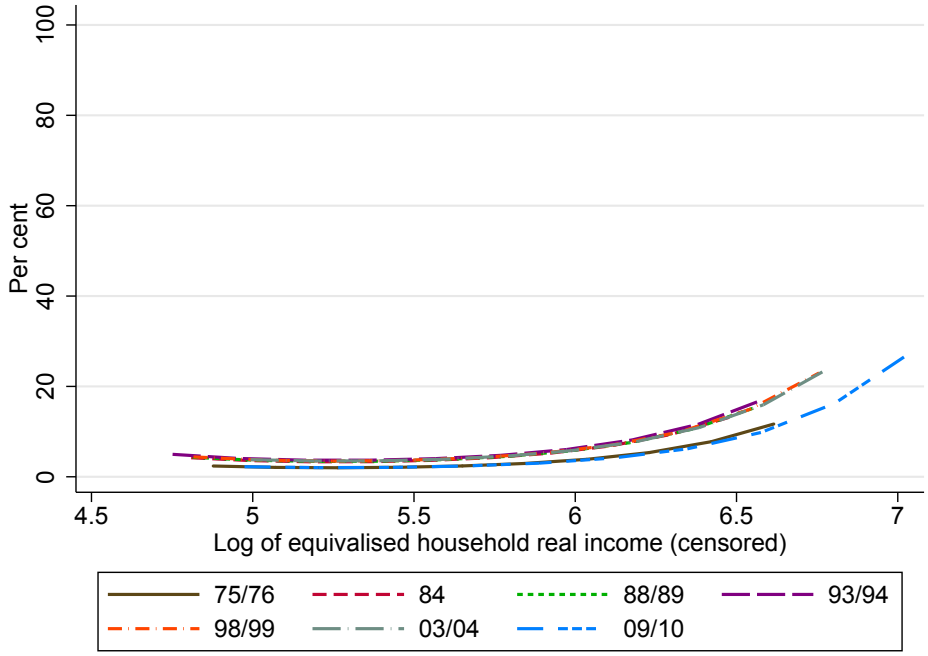


Figure 6: Predicted proportion of households using any high-fee private school

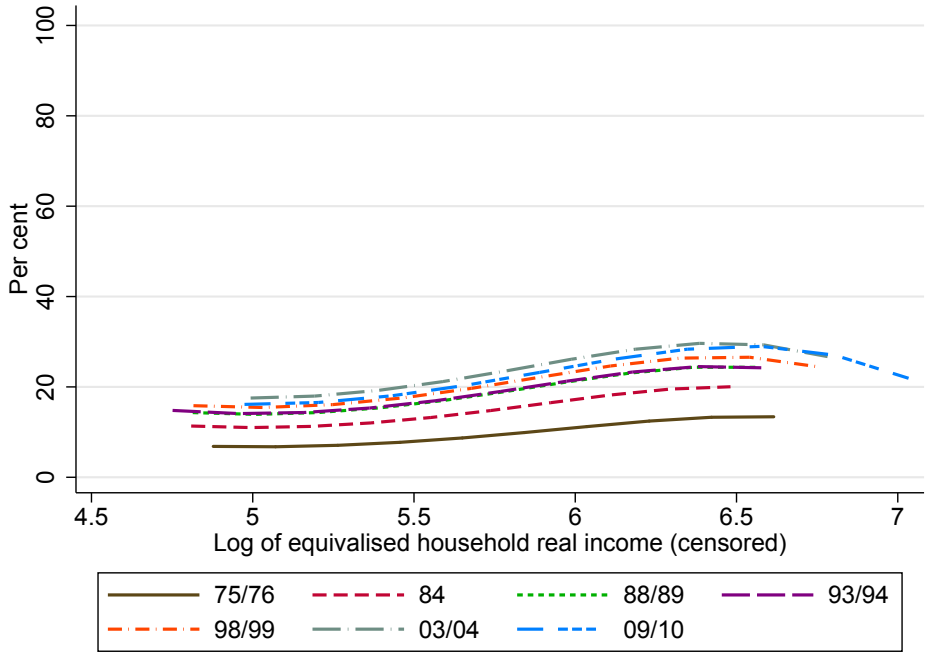


Figure 7: Predicted proportion of households using some low-fee but no high-fee private school

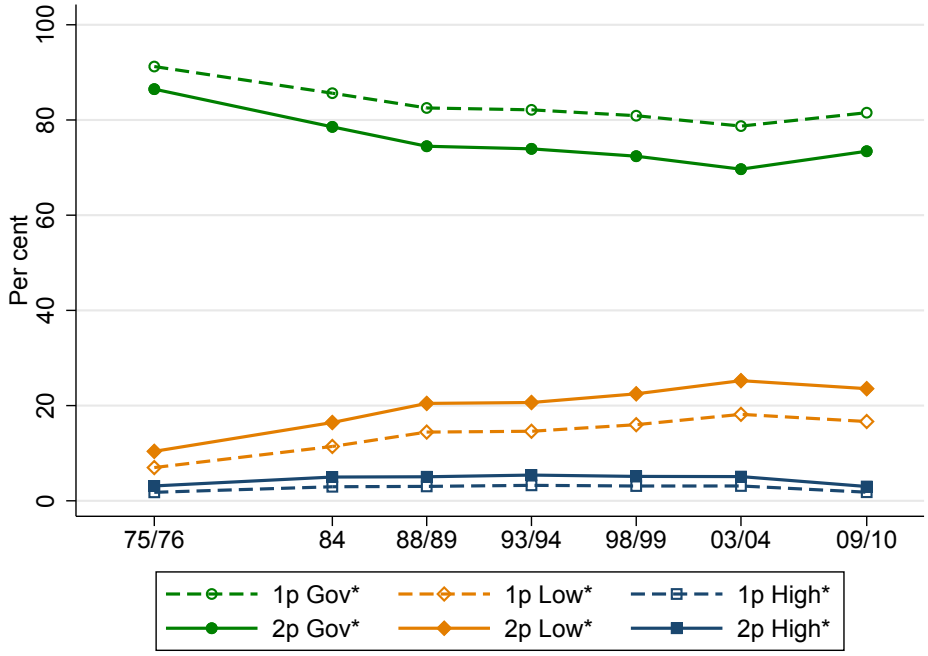


Figure 8: Predicted probabilities for one- (1p) and two-parent (2p) households

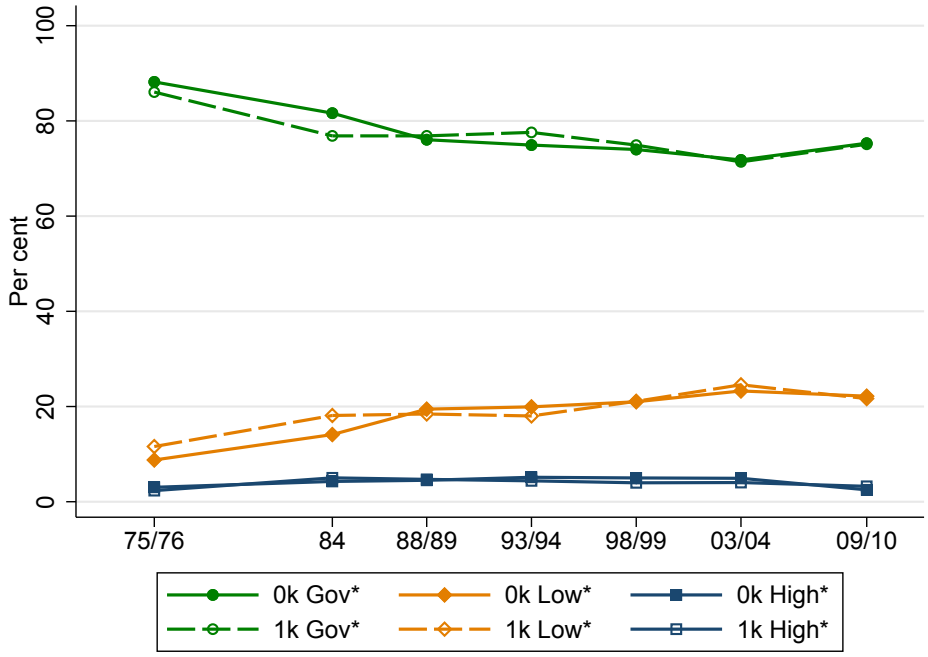


Figure 9: Predicted probabilities for households with zero (0k) and one (1k) child aged 0–4

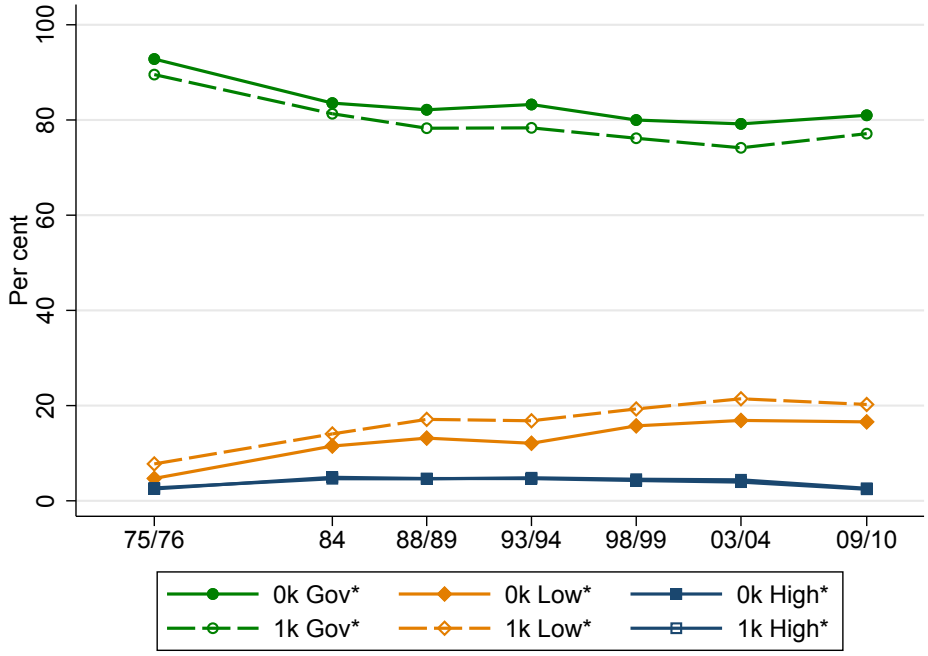


Figure 10: Predicted probabilities for households with zero (0k) and one (1k) child aged 5–14

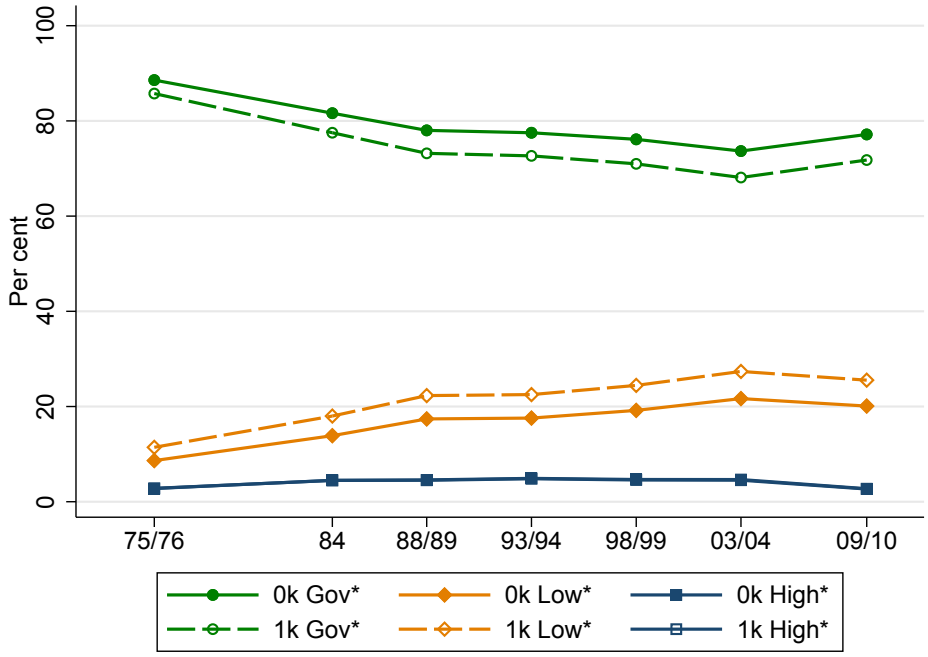


Figure 11: Predicted probabilities for households with zero (0k) and one (1k) child aged 15–17(16)

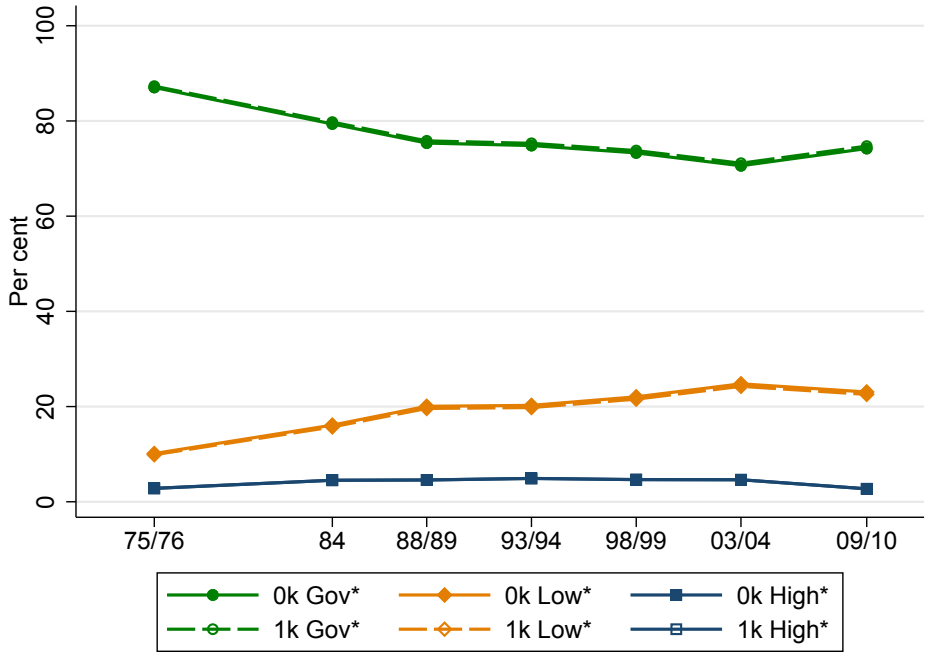


Figure 12: Predicted probabilities for households with zero (0k) and one (1k) child aged 18(17)–99

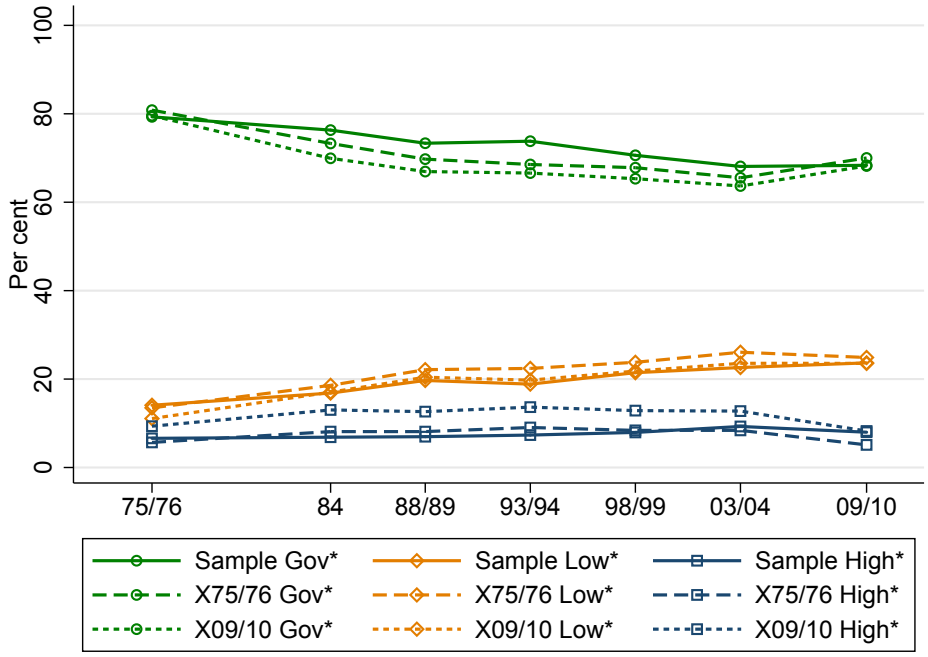


Figure 13: Actual (sample) and predicted proportions at constant covariates (X75/76 and X09/10).

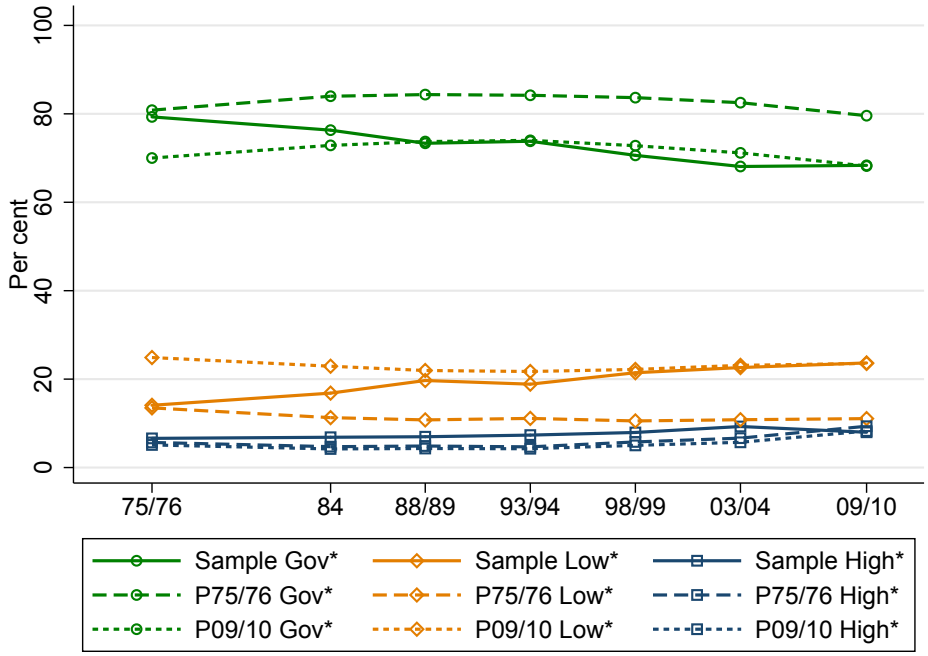


Figure 14: Actual (sample) and predicted proportions at constant parameters (P75/76 and P09/10).