

# SHADOW EDUCATION IN MALAYSIA: IDENTIFYING THE DETERMINANTS OF SPENDING AND AMOUNT OF TIME ATTENDING PRIVATE SUPPLEMENTARY TUTORING OF UPPER SECONDARY SCHOOL STUDENTS

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**Abstract:** *This paper examines the determinants of spending and the amount of time attending private supplementary tutoring, or commonly known as private tuition, in Malaysia. Based on 343 self-reported questionnaires with upper secondary students across three states in Malaysia and using multiple regression analysis, we identified ethnicity, father's level of education and past academic performance as significant determinants of spending and amount of time attending private tuition. However, interestingly, we found that while geographical location and participation in internal tuition in schools were also determinants of spending, these two were not significant in determining the amount of time attending private supplementary tutoring. The identification of determinants of spending and amount of time, and in addition, the differences between these two illustrates the economic and educational dimensions of shadow education. More importantly, the insight also contributes to the formulation of possible interventions that can improve quality and reduce inequality in the mainstream education system.*

**Keywords:** *shadow education, Malaysia, secondary education, demand for education*

## Introduction

Shadow education is a set of educational activities outside formal schooling or mainstream education, which primarily refers to private supplementary tutoring (Bray and Lykins, 2012; Stevenson and Baker, 1992). The term 'shadow' suggests that these educational activities mimic and reflect mainstream schools and the education system. Bray and Lykins (2012) used the analogy of sundial and its shadow to illustrate the relationship between the two education systems.

The mainstream education system has become an important agenda in policy dialogue due to the importance of education in economic and social developments. Education has been recognised as playing a vital role in reducing inequality, promoting social mobility and contributing towards inclusive growth and development. However, shadow education has been given relatively less attention both in policy dialogue and from an educational perspective. This lack of attention on shadow education has implications that may undermine the efforts of mainstream education in expanding access, strengthening inclusiveness and improving quality, relevance and cost efficiency of education (Sarvi, 2012).

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Like most Asian countries where shadow education has become a major phenomenon (Cheo and Quah, 2005), shadow education in Malaysia has also become an essential feature of the country's education system. This article focuses on the demand for shadow education in Malaysia, specifically to identify the determinants of spending and amount of time attending supplementary tutoring among upper secondary school students. As Bray (2014) argues, one of the challenges in analysing shadow education is that the definition used to define the educational activities is too broad to be meaningful and the research question and focus needed to be refined. Therefore, this paper only focuses on spending and the amount of time spent attending private supplementary tutoring.

This article comprises five sections. The first examines the phenomenon of shadow education in Malaysia, the second explores the determinants and ways in which these factors can be identified and examined, the third section discusses the methodology and empirical evidence, and followed by the model and findings. The article concludes by discussing the implications of the findings from economic and educational perspectives with policy recommendations.

### Shadow Education in Malaysia

Supplementary tutoring or tuition is a social and educational phenomenon in Malaysia. In a survey conducted in the capital Kuala Lumpur with 1,600 students across eight schools, 88 % of primary school students use some form of private tutoring (Tan, 2011). A separate survey on the ability of secondary school students to transit into institutions of higher education, conducted across three other states of Malaysia with 641 students across six schools reaffirmed the extent of tuition where 89 % of Upper Secondary (Year Ten and Eleven) students relied on some form of supplementary tutoring (Aida et al., 2015).

In Malaysia, supplementary tutoring comes in various forms; private tutoring session and tuition centre based mass tutoring sessions. Anecdotal information suggests that private tutoring sessions are conducted on a one-to-one basis or in a small group, which is typically held at the home of either the student or private tutor. Tuition centres which cater for large number of students have double or triple the average teacher-to-student ratio of Malaysian government schools (typically 1:35). According to Kenyathulla (2014) citing the Ministry of Education there are more than 3,000 registered tuition centres with the Ministry of Education, involving 11,967 tutors and 3.2 percent of the total number of students in primary and secondary schools.

However, apart from private tutoring and tuition centre, supplementary tutoring is also carried out in mainstream schools. This is carried out by school teachers for some of their students outside of the normal schooling hours, typically in the evening. This is also a form of shadow education that may be peculiar to the Malaysian context, and like other forms of supplementary tutoring, students also have to fork out additional fees to attend these sessions. We term this form of shadow education as internal tuition. Although internal tuition is not the focus of our paper, these activities have some influences on external tuition, which we will examine later.

In terms of spending on tuition, using the 2004/05 Household Expenditure Survey, Kenyathulla (2012) estimated about 20 % of households spent money on private tutoring. Across four Household Expenditure Surveys, the average spending of households on education were Malaysian Ringgit (RM)17 (in 1993/94), and increased to RM31 (in 1998/99) and RM38 (in 2004/05) respectively (1 RM is about 0.24 US Dollars). However, in the latest survey in 2009/10, the average spending of households on education was merely RM31, which made up of only 1.4 % of total expenditure of households (Department of Statistics, 2011). Furthermore, there were differences in the average spending of households on education across stratum and ethnic groups. On average, the urban households spent RM39 on education expenditures but rural households only spent RM13 (DOS, 2011). As a multi-ethnic country, there are distinct differences in terms of income as well as the preference for spending. The average household income for *Bumiputera*,<sup>1</sup> Chinese and Indian was RM4,457, RM6,366 and RM5,233 respectively (Khazanah Research Institute, 2014) and the average spending for education was RM25, RM50 and RM41 respectively (DOS, 2011).

To briefly conclude, supplementary tutoring or tuition is indeed a societal trend in Malaysia as illustrated through the surveys by Tan (2011) and Aida, et al. (2015) but empirical evidence that shows the extent of this phenomenon and the economic value of these educational activities remain scarce and piecemeal. While efforts can be taken to measure the economic value of supplementary tutoring as an economic sector, however, it is also important to understand the determinants that influence the decision that influences the amount of spending of parents and students on tuition. Furthermore, to provide a clearer understanding of the determinants of supplementary tutoring, spending should also be examined alongside the amount of time spent attending tuition. Identifying determinants will not only help us to understand the economic perspective, but equally important, gain insight on the educational perspective of shadow education.

## **Review of Literature on Shadow Education**

This section aims to review previous research conducted on the demand for shadow education will focus more specifically on supplementary tutoring. This review will help to inform selection of variables for analysis in identifying the determinants of spending and amount of time spent attending private tuition.

While spending is a factor commonly used to examine the demand for shadow education, the amount of time spent attending private tuition is not a common variable examined. Most previous research concerning shadow education focused on participation as an act of taking part in shadow education without considering whether students attend private tuition or not (Barrow and Lochan, 2012; Buchmann, 2002; Jelani and Tan, 2012; Liu, 2012; Nath, 2008; Stevenson and Baker, 1992; Tansel and Bircan, 2005). There is also research undertaken by Ireson and Rushforth (2005) which examined the determinants of the subjects taken and the amount of time spent attending private tuition. This therefore depicts a gap in which minimal research has been conducted to investigate the determinants of demand for shadow education by concurrently examining the price and quantity; specifically the two dependent variables –spending and amount of time spent attending private tuition.

In terms of the independent variables, parents' demographic is a determinant of participation and spending in shadow education. Students from higher socioeconomic background or those with more affluent parents are more inclined to participate in shadow education, and this phenomenon is consistent across Hong Kong, European Union, Croatia, Bosnia and Herzegovina, Malaysia and Japan (Bray, 2011; Bray and Kwok, 2003; Jokic et al., 2013; Jelani and Tan, 2012; Stevenson and Baker, 1992). Not only is this factor a determinant of participation, it is also claimed that the propensity to spend on shadow education increases in line with the household's expenditure level (Kanellopoulos and Psacharopoulos, 1997). This relationship can be explained by the fact that tuition is regarded as a necessity by those at the high-expenditure quantiles than the other end of the spectrum (Kim and Park, 2010).

Apart from the demographic factor, parents' level of education is another positive determinant for shadow education. Participation in shadow education increases with an additional year of parents' education, and this trend is consistent across diverse countries such as Egypt, Hong Kong, Kenya, England and Malawi (Assaad and El-Badawy, 2004; Bray and Kwok, 2003; Buchmann, 2002; Ireson and Rushforth, 2005; Paviot et al., 2008). Similarly, in examining cram schools in Taiwan, which is also a form of supplementary tutoring, parents with the lowest level of education (middle-school or lower) are less likely to send their children to such schools as compared to those with other higher levels of education (Liu, 2012). The propensity to spend on supplementary tutoring is also significantly related to parents' educational levels, as evidenced by studies conducted in Greece, South Korea and Bangladesh (Kanellopoulos and Psacharopoulos, 1997; Kim and Park, 2010; Nath, 2008).

However, in addition to the overall parents' level of education, father's and mother's level of education also has a varying effect on the participation of and spending on tuition but the results appear to be inconclusive. Most of the studies reported that mother's level of education

has a stronger impact as compared to father's level of education (Jelani and Tan, 2012; Kim and Lee, 2010; Tansel and Bircan, 2005). More specifically, Dang (2007) found that mother's education has a positive impact on supplementary tutoring at the primary level, but no impact on the lower secondary level; but interestingly, father's education had the exact opposite effect. Yet in terms of the expenditure, a study in Sri Lanka reported that father's level of education has a stronger effect outweighing the mother's whereby an additional year of education for father's and mother's will increase the expenditure on tuition by six and two % respectively (Pallegedara, 2011). Regardless of whether the father's or the mother's level of education has the greater effect, parents' education is a strong determinant that tends to place a higher emphasis on shadow education in the pursuit of greater academic excellence.

Academic excellence is also a strong determinant of participation in shadow education. In the pursuit for better academic performances or to maintain an existing level of performance, students with better grades or academic standing have been shown to be more likely to engage with supplementary tutoring (Stevenson and Baker, 1992). Research has shown that the rate of incidence on supplementary tutoring and the amount spent significantly grew with higher academic achievement levels (Bray, 2011; Kim and Lee, 2010; Kim and Park, 2010). This proposition is further supported by the argument that students who believed that academic results are not important are less likely to engage in supplementary tutoring, where in the case of Hong Kong, Bray and Kwok (2003) showed that schools with higher-band intakes have higher levels of tutoring than the schools with lower-band intakes. Bray (2013) also highlighted that students who rated themselves as good were more likely to attend tuition, as compared to their peers who rated themselves as excellent. Furthermore, students who rated themselves as poor were more likely to participate in tuition as compared to those who rated themselves as fair. The demand for supplementary tutoring is much stronger in education systems that are examination-driven as well as presence of competitive entry systems into schools and universities (Barrow and Lochan, 2012; Kim and Lee, 2010; Tansel and Bircan, 2005; Watson, 2008). Importantly, the strong relationship between high academic achievement and the high incidence of supplementary tutoring has to a large extent confuted the idea that weaker students are more likely to engage in these shadow educational activities; rather, students who have better grades tend to participate more actively in shadow education to help them achieve their academic goals (Liu, 2012).

Age of students can also be a determinant of participation and spending in shadow education. In Malaysia, it was reported that upper primary students are more likely to attend private tuition and spend more than lower primary students in Malaysia (Jelani and Tan, 2012). Similarly in Vietnam, there was a 30 percent and 66 percent increase in the spending on private tutoring at the primary and secondary level respectively when a student moves nearer to the last grade within the level of education (Dang, 2007). This notion is also reaffirmed by Barrow and Lochan (2012) who found that participation in private tutoring increases incrementally until a student sits for the Secondary Entrance Examination in Trinidad and Tobago. As the age and level of education increases, the stake in examination becomes greater. Therefore, there is a greater motivation for students to participate and spend on supplementary tutoring in preparation for examinations, and the participation and spending increases as the stake in examination increases (Bray and Kwok, 2003).

In terms of the geographical differences of students, the urban and rural connotation is a significant determinant on participation in shadow education. Consistent across different education systems including Japan, Kenya, South Korea and Sri Lanka, there is a greater demand and supply of supplementary tutoring in urban regions as compared to rural areas (Buchmann, 2002; Kim and Park, 2010; Pallegedara, 2011; Stevenson and Baker, 1992). More specifically, there are instances where the urban and rural differences only existed at certain levels of education, for example in the case of Vietnam where this difference was only applicable at the primary school level (Dang, 2007). However, there are exceptions where urban-rural difference is insignificant, for instance in Egypt (Assaad and El-Badawy, 2004), as well as a reduction over time in the urban-rural gap in terms of participation of shadow education such as in Bangladesh (Nath, 2008).

Besides the urban-rural stratum, there are also ethnic differences in countries and education systems that are multi-ethnic. For instance in Malaysia, it was found that households of Malaysians who are of Chinese and Indian descent are more likely to send their children to private tuition as compared to ethnic Malays who are the majority ethnic group in Malaysia (Jelani and Tan, 2012). Similarly, white students in England are less likely to participate in tutoring as compared to other minority ethnic groups where Indian students have the highest participation, followed by Chinese, African, Pakistani and Caribbean (Ireson and Rushforth, 2005). In contrast, Dang (2007) explained that spending on private tutoring reduced by as much as 32% when a primary school student is from an ethnic minority group in Vietnam, although there is no significant difference at the lower secondary level. On a similar note, the Tamils, which is the ethnic minority in Sri Lanka are less likely to spend money on private tuition classes as compared with the Sinhalese majority (Pallegedara, 2011). In general, ethnicity does have an impact on a student's participation in shadow education especially in explaining intra-system differences within a multi-ethnic context.

From the literature, parents' demographic and level of education as well as individual characteristics of the students in terms of age, academic excellence, geographical and ethnicity are among the independent variables that determined the participation in shadow education.

## Data and Methodology

The data for this paper is from a research project titled Transition from Secondary Education to Higher Education: The Case of Malaysia and used with permission from the researchers of the project (see Aida et al., 2015). In the research project, a two-page survey questionnaire was distributed to upper secondary students (Year Ten and Eleven) across six schools in three States of Malaysia – Penang, Kelantan and Sabah. In each State, two schools were selected: [ one is located in the urban area and another in the rural area. The survey questionnaire was administered by a teacher in the school.

As the survey questionnaire was conducted to examine a broader only the indicators in the survey questionnaire that are related to shadow education were used in this paper. The indicators/variables are: (i) number of subjects registered for the Malaysian Certificate of Education examination, (ii) father's and mother's level of education, (iii) result of the Lower Secondary Assessment, (iv) participation in internal and external tuition, (v) number of hours a week attending internal and external tuition, (vi) subjects taken for external tuition, (vii) spending per month for external tuition, and other demographical variables including ethnicity and the school (which has taken into account the urban-rural and state distribution).

Due to the nature in which empirical evidence used in this paper was derived from a larger project, there are some limitations to be acknowledged. We are not in the position to design the sampling of the survey questionnaire and neither are we able to change its structure and data collection method. We do not claim that the findings are representative across Malaysia, as the sampling only involved three of the fourteen states. The survey questionnaire is a form of self-reporting, and this form of data collection does not allow much triangulation and validation of the empirical evidence reported by the respondents. Moreover, we are also not able to account for possible biases and discrepancies resulting from the fact that the survey questionnaire was administered by teachers in the schools. Yet, as shadow education and private tuition are not the main theme of the questionnaire, but only a section in the larger questionnaire, the sensitivity of the topic with teachers may not have influenced the responses. In addition, the limitation of empirical evidence have also refrained us from exploring with greater depths specific aspects of shadow education, for instance the ways in which internal and external tuitions are conducted. Although there are limitations to the empirical evidence, it is important to recognise the focus of this paper is to examine the determinants of spending and amount of time spent attending private supplementary tutoring. As such, participation in private supplementary tutoring became the inclusion criteria in the selection of samples and the empirical evidence used in this paper was derived from 343 respondents who reported in the survey that they participated in private supplementary tutoring.

**Table 1. Descriptive Statistics and Definition of Variables**

Variable	Definition	Mean	Std Dev	Min	Max
Urban School	Dummy Variable for Urban School	0.70	0.50	0	1
Hours spent in internal tuition	Continuous variable for hours spent at internal tuition	4.53	5.90	0	30
Father's educational level	Categorical variable for Father's level of education	3.39	1.07	1	6
Academic Excellence	Categorical variable for no. of A's in Lower Secondary Assessment	3.44	2.75	0	9
Chinese	Dummy Variable for ethnic Chinese students	0.35	0.43	0	1
Indian & Others	Dummy Variable for students of Indian and other ethnicities (excluding Malay, Chinese and East Malaysian <i>Bumiputera</i> )	0.08	0.23	0	1
East Malaysian <i>Bumiputera</i>	Dummy Variable for students of ethnicities from East Malaysia	0.11	0.41	0	1
Spending on external tuition	Continuous variable for spending on external tuition	181.43	163.17	5	1100
Hours spent in external tuition	Continuous variable for hours spent at external tuition	6.00	4.00	1	30

Table 1 presents the descriptive statistics and definition of variables. Out of 343 respondents, 70 % were in urban schools and the remaining in rural schools. The respondents also comprised of 46 % Malay, 35 % Chinese, 8% Indian and Other, and 11% *Bumiputera* from East Malaysia. In terms of the respondents' father's level of education, 3% were primary school leavers, 13 % were lower secondary school, 47 % completed upper secondary school, 21 % with a diploma, 11 % with a bachelor degree, and 5% with a postgraduate degree. In terms of the previous academic achievement, 13% did not score any A in their Lower Secondary Assessment and 1.5 % scored nine As.

The main variable examined in this paper is the amount of spending on supplementary tutoring outside of school. The average spending for supplementary tutoring is RM 181.43 per month with a standard deviation of RM163.17. The minimum value is RM5.00 per month and the maximum value is RM1100.00. Consistent with most expenditure data, the spending amount is not normally distributed. This was confirmed using the Kolmogorov-Smirnov Normality Test, which indicates that the spending variable was not normally distributed. Hence, as a way to normalise the data, the spending variable was transposed with logarithm into 'log spending'.

In addition, the amount of hours spent attending external tuition is also used as a dependent variable to examine the extent of participation. The average number of hours a week spent is 6 hours with a standard deviation of 4. The minimum value is one hour and the maximum value is 30 hours. Similar to spending, the number of hours spent on tuition is not normally distributed and therefore normalised by transposing the time variable with logarithm into 'log hours outside'.

The selection of the independent variables was guided by the review of literature on determinants of shadow education as well as availability in this dataset. Primary analysis using a stepwise additive regression was used to determine the variables for the full specification multiple regression model. The independent variables identified were: (i) urban-rural school to represent the geographical differences; (ii) ethnicity, given that Malaysia is a multi-ethnic country and ethnic differences have been a major determinants on income and spending; (iii) hours spent on internal

tuition, where to normalise the logarithm variable is used; (iv) father's level of education, which has a higher explanatory value compared to mother's level of education; and (v) number of As in the previous national Lower Secondary Assessment (taken at Year 9) as a proxy for academic excellence.

### The Model and Findings

The full specification multiple regression model comprising all the variables identified were regressed with spending and time spent respectively as dependent variables. The justification for studying these two dependent variables in separate models is because spending on private supplementary portrays the price households are willing to pay, in which this variable has an economic bearing on policy implications. On the contrary, total hours spent in private supplementary tutoring portrays participation on a greater level as compared to spending. Hence, this study concurrently examines the determinants of both price and quantity, of which there is still a literature gap in combining these two aspects. Besides, the differences in determinants of these two dependent variables gives a greater insight to the study of patterns of participation in shadow education.

The independent variables explained 44.2 percent and 16.9 percent of the variations in the dependent variable across the two models, as reflected by the R-square values (see Table 2). Hence, the independent variables used in the models are more suitable to explain the determinants of spending as compared to time spent on private tuition.

**Table 2. Determinants of Log Spending and Log Hours Outside Model**

Variable	Logspending Model			LoghoursOutside Model		
(Constant)	3.846	**	(0.155)	0.957	**	(0.147)
Urban School	0.300	**	(0.107)	0.058		(0.102)
Log Hours spent in internal tuition	-0.161	**	(0.052)	-0.015		(0.052)
Father's educational level	0.092	**	(0.039)	0.081	**	(0.038)
Academic Excellence (No. of A's in PMR)	0.046	**	(0.018)	0.051	**	(0.017)
Chinese	0.886	**	(0.111)	0.335	**	(0.104)
Indian & others	0.806	**	(0.151)	0.425	**	(0.138)
East Malaysian <i>Bumiputera</i>	0.460	**	(0.146)	0.234	*	(0.136)
R-squared	0.442			0.169		
F value	32.676			7.773		

Note : Standard error in parentheses; \*\*Significance at 5% level; \*Significance at 10% level

Across the two models, the father's level of education, academic excellence and ethnicity were the three significant variables that were consistent for spending and the amount of time spent attending private tuition. Interestingly, the hours spent on internal tuition and urban-rural variable were significant determinants of spending but insignificant to the amount of time spent.

#### *Urban-Rural*

Geographical location is a determinant of spending for supplementary tutoring. Our empirical evidence estimated that students in an urban school spend 35 %t<sup>2</sup> more than their peers in a rural school. The significance of urban-rural differences reaffirmed the findings of earlier studies (see

Kim and Park, 2010; Pallegedara, 2011), and specifically in the case of Malaysia, an earlier study shown that on average, urban and rural students spent RM503 and RM231 respectively for tuition (Osman and Rajah, 2011). Kenyathullah (2013) also reaffirmed that urban students are more likely to enrol in and spend more on private tutoring. However, geographical location is insignificant as a determinant of amount of time spent attending external tuition, whereby there is no significant difference in the number of hours spent on external tuition between students in urban and rural schools. This findings differ from earlier studies by Buchmann (2002) and Nath (2008) whereby they suggested that students from urban schools tend to spend more hours attending private tuitions than their rural counterparts.

The different geographical locations as a determinant of spending and time spent illustrates an interesting proposition. The findings suggest that while there is no difference between the time spent by urban and rural students in supplementary tutoring outside of schools, the significant difference in spending implies that it is more expensive for students to attend supplementary tutoring in urban areas. A number of plausible explanations that contributed to this proposition include the higher cost of living in urban area, as well as a possibility that supplementary tutoring is carried out in urban areas more professionally and business-like to capture a larger market. Thus, the urban-rural stratum can only be considered as a determinant to the money spent on tuition but not the number of hours spent.

### *Internal and External Tuition*

Although the focus of this paper is to identify the determinants of spending and time spent of external tuition, the time spent on internal tuition is identified as a significant determinant of spending but not the time spent on external tuition. The logarithm of hours spent on internal tuition has a negative relationship to logarithm of spending for external tuition. An increase of one percent in the hours spent on internal tuition will reduce the spending on external tuition by 0.161 percent. However, there is no significant relationship between the time spent on internal and external tuition. This finding therefore implies that more time spent on supplementary tutoring in school will reduce the monetary incentive for students to spend on tuition outside the school. Yet, time spent on tuition in school does not determine the participation of tuition outside of school.

### *Father's Level of Education*

Parental education is a significant determinant of spending and the amount of time spent attending shadow education. However, between father's and mother's level of education, our model showed a higher explanatory value for father's level of education and hence this was used as an independent variable to represent the status of the family. The result shows that when a father's level of education is one level higher than another father, for instance between postgraduate and bachelor degree holders, spending and amount of time spent attending supplementary tutoring are higher by 9.2 percent and 8.1 percent respectively. This positive relationship between father's level of education with spending and participation in shadow education is consistent with previous studies conducted (see Pallegedara, 2011).

It is expected that fathers with a higher level of education tend to on average have a higher income as compared to their counterparts with a lower level of education. Hence, the higher income of the fathers also implies that the household has greater spending ability to support the child to improve or maintain his or her academic performance. The greater spending ability of household may also encourage their children to participate longer hours in supplementary tutoring. More importantly, identifying this determinant reaffirms Bray's (2009) argument that shadow education exacerbates social inequalities whereby economic and social yield from education depends on the social and cultural capital inherited from the family (Bourdieu, 1986). In other words, students whose parents have higher academic achievement have accumulated the capability or 'capital' for



these students to have an advantage over their peers whose parents do not have the same level of academic achievement. . The added capability or 'capital' inherited from the previous generation will further create an unequal competition in the current generation.

### *Academic Excellence*

Previous academic achievement is a determinant of spending and amount of time spent attending supplementary tutoring. The level of achievement is measured by the number of As students obtained in their Lower Secondary Assessment, the last public examination sat by the respondents prior to responding to the questionnaire, and that the result of this assessment is comparable across the country. From the model, it was estimated that for a student who has an additional 'A' as compared to his or her peers, he or she is likely to spend 4.6% more on supplementary tutoring and to attend an additional 5.1 % hours of private tuition. This findings is consistent with many previous research (see Bray, 2011; Kim and Lee, 2010; Kim and Park, 2010; Liu, 2012; Stevenson and Baker, 1992). The rationale underlying this finding is that students who have better grades tend to put a greater emphasis on their academic performance and therefore have greater incentive to spend and participate in tuition as a way to help them maintain or improve their academic goals. This also shows that shadow education to some extent exacerbates the educational divide in mainstream education in schools. For instance, students who are not performing academically would have given up and therefore do not participate in supplementary tutoring, and students who are performing well would want to improve faster by attending external tuition.

### *Ethnicity*

Last but not least, ethnicity is a determinant of spending and amount of time spent participating in shadow education in Malaysia. This findings is expected in the context of a multi-ethnic country like Malaysia (see Jelani and Tan, 2012; Jelani et al., 2015; KRI, 2014; Wan, 2005). The importance of ethnicity may contradict the findings of previous studies conducted in other countries or societies, particularly in mono-ethnic and less diverse populations, such as those reported by Dang (2007) and Pallegedara (2011). In our model, students of Chinese descent are likely to spend 143 %<sup>3</sup> more for tuition fees and 40 % more hours per week than their Malay peers. Likewise, students of Indian descent and other minorities groups like Sinhalese and Eurasians are likely to spend 124%<sup>4</sup> more on fees and 53 %<sup>5</sup> more hours than their Malay counterparts. As for the *Bumiputera* from East Malaysia, which comprises the Kadazandusun, Bajau, Murut and others, tend to spend 58 %<sup>6</sup> more on fees and 26%<sup>7</sup> more of their time a week for tuition, as compared to their Malay counterparts in Peninsular Malaysia.

To explain ethnicity differences, there are a number of justifications. First, Bray (2009) pointed out that Confucian traditions tend to place greater importance on education and self-diligence and this proposition may partly contribute to the higher spending and hours of participation in shadow education by students of Chinese descent. Second, up to 2002, entrance into Malaysian public universities had an ethnic quota. Although the quota was abolished and replaced by meritocracy, there remained different policies for admission based on ethnicity whereby there are two pathways of pre-university programmes into public universities. There is a Matriculation programme which has a quota of 90:10 *Bumiputera* (including Malay and other ethnic groups in East Malaysia) and non-*Bumiputera*, and the STPM examination. Although differing in standards, the grades of the two programmes are used as one common entry criteria (Lee, 2004). Hence, the higher propensity to spend and more time devoted to external tuition by students of Chinese, Indians and other descents may be driven by the need for them to excel academically in a more competitive pathway into universities. Third, the lower incidence of Malay and East Malaysian *Bumiputera* students engaging in external tuition may be related to the fact that these students have a higher tendency to be in boarding schools and therefore do not leave the school compound to acquire additional

supplementary tutoring. Fourth, at the primary level, there are vernacular schools in Malaysia using Mandarin and Tamil as their medium of instructions. However, at the secondary level, Malay becomes the only medium of instruction. Thus, students from Chinese or Indian descent are more likely than their Malay and *Bumiputera* peers to attend tuition for the Malay language to help them master the language. Regardless of the possible reasons underlying ethnic differences in terms of spending and amount of time spent, ethnicity is a significant determinant of spending and amount of time spent attending private supplementary tutoring in Malaysia.

## Discussion and Conclusion

Shadow education is now a major phenomenon in Malaysia. This study identifies ethnicity, father's level of education and academic excellence as determinants of spending and amount of time spent; while geographical location and participation in internal tuition as determinants of spending but not the amount of time spent in supplementary tutoring. The identification of these determinants has important economic and educational imperatives.

It is important to first recognize that shadow education has grown as an economic sector based on demand and supply without much governmental intervention. It has been left in the invisible hands of the market, and identifying the determinants of spending and amount of time spent has given us some insights into the ways in which individuals participate in this economic sector. Although Bray and Lykins (2012) argue that shadow education should not be left to the market forces but instead would benefit from more active policy interventions. However, from understanding these determinants, we argue that the interventions and initiatives should target and address issues in the mainstream education system.

One of the key issue in the mainstream education system that was 'illuminated by its shadow' is the phenomenon of overemphasis on examinations and grade inflation. For instance, the national examination in Year 11, Sijil Pelajaran Malaysia (SPM) has over the years suffered from massive grade inflation. In year 2000, the 'open paper' system for SPM was introduced whereby students have the flexibility to choose the number of subjects. This resulted in students attempting more than 20 subjects, and in 2007, the national top scorer for SPM got 21 A's. Interestingly, in 2008 where more than 400,000 students sat for SPM, 6,277 students scored straight A's (The Sun Daily, 2009). Hence, to curb grade inflation and the 'rat-race' for A's, a cap of ten subjects and an additional grade A+ were introduced for SPM beginning 2009.

The findings on determinants of spending and amount of time spent for shadow education reflects that the 'rat race' for Ass in examination within the mainstream education system still exists. Given that one of the findings of this study showed that students who are academically better tend to spend more on tuition classes, this reinforces the point that private tuition is predominantly used to help students to maintain or perform better in examinations, rather than helping those who are academically weaker to catch up. Compounded by the fact students whose fathers have higher level of education tend to spend more on tuition, which also indirectly suggests a higher level of income in a household, this strengthened the proposition of private tuition used to fuel the 'rat race' and further widening social inequalities (Bray, 2009).

Yet, the most critical reflection about the mainstream education system from its shadow concerns the quality of education. Given the prevalence of private tuition and especially the amount of time spent on it this phenomenon to some extent illustrates that students and/or their parents either feel that the education provided in schools is insufficient or not meeting their expectations. This situation may or may not relate to the overemphasis on examination, but certainly highlights a bigger issue of confidence with the overall education system. Adding on the rather dismal performance of Malaysian students in international tests such as PISA and TIMSS, policymakers and educators therefore may need to ask: Why are students spending additional time and money for private tuition in addition of the 30 hours a week of formal schooling? This study is only able to show the amount of money and time spent, but further study is required to understand the underlying reason.

## Notes

<sup>1</sup>*Bumiputera* refers to the sons of the soil, which represent the Malays, East Malaysian ethnic groups and other indigenous ethnic groups of Southeast Asia. In this research, “East Malaysian *Bumiputera*” refers specifically to ethnic groups present in Sabah, such as Kadazandusun, Bajau, Melayu Brunei and Murut, and “Malay” refers to those in Peninsular Malaysia.

<sup>2</sup>The semielasticity for the dummy regressor is calculated using the device suggested by Halvorsen and Palmquist; taken from Gujarati (2003). The antilog (to base e) of the estimated dummy coefficient is computed, then 1 is subtracted from it and the difference is multiplied by 100. For instance,  $[\text{antilog}(0.3) - 1] \times 100 = 35$  percent.

<sup>3</sup>The calculation is as follows :  $[\text{antilog}(0.886) - 1] \times 100 = 143$  percent.

<sup>4</sup>The calculation is as follows :  $[\text{antilog}(0.806) - 1] \times 100 = 124$  percent.

<sup>5</sup>The calculation is as follows :  $[\text{antilog}(0.425) - 1] \times 100 = 53$  percent.

<sup>6</sup>The calculation is as follows :  $[\text{antilog}(0.460) - 1] \times 100 = 58$  percent.

<sup>7</sup>The calculation is as follows :  $[\text{antilog}(0.234) - 1] \times 100 = 26$  percent.

<sup>8</sup>The data used in this study is from The Transition from Secondary Education to Higher Education: Malaysia project, comprising of Professor Dr. Aida Suraya Md. Yunus, Professor Dato’ Dr. Ibrahim Che Omar and Dr. Chang Da Wan (one of the authors of this paper). Both authors greatly appreciate the permission given to us to use the data for this paper.

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