

Malaysian Adolescents Not in School: The Nexus of Education, Work and Gender*

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Abstract: Malaysia has achieved all the Millennium Development Goals, including that of education, a consequence of expanding opportunities for education at all levels. These positives notwithstanding, significant attrition occurs in secondary school despite the provision of universal secondary education, with male attrition exceeding female attrition. The study finds that this has contributed not just to an under-qualified labour force but to a reduction in the potential for a tertiary educated one. The gendered nature of attrition is seen to be consistent across different indicators of educational outcomes and across different strata of society. It is argued that this is a symptom of critical deficits in the classroom. The over-correction in gender imbalance in education has not improved women's position in society relative to other countries. Unless educational reform policies are directed at the black box that generates learning in the classroom, Malaysia will find it difficult to maintain its competitiveness in the world economy.

Keywords: Educational outcomes, gender, labour force, school dropout, quality of schooling
JEL classification: I25, J16, J21, J24

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1. Introduction

Education is critical in the light of Malaysia's strategic move to transform its economy into a knowledge-based one.¹ In this context, education encapsulates all activities intended to increase the knowledge and skills of individuals suited to a knowledge economy including the need for life-long learning and training. Education and early work experiences are so important that they appear in three of the eight targets of the Millennium Development Goals (MDGs).² The three MDG targets are Target 3 on universality of primary education, Target 4 on gender balance in education and Target 16 on the provision of decent and productive work for young people aged 16–24 (see <http://www.unmillenniumproject.org/goals/gti.htm>).

With the expanding opportunities for education in Malaysia, MDG Target 3 has been reached. Subsequent to the introduction of a free comprehensive education system in 1962 and increased efforts targeting rural areas in the 1980s (Ministry of Education, Malaysia, 2003), universal primary education (99%) was achieved by the mid-1980s (Lee & Nagaraj, 2006). By 2000, the enrolment rate was about 85.0% in public secondary schools (Ministry of Education, Malaysia, 2003, pp. 1-4). Lower figures in more recent years have been attributed to the increasing enrolment in private schools (Ministry of Education, Malaysia, 2003). MDG Target 4, usually stated in terms of correcting lower female enrolment ratios and empowering women, also appears to have been achieved. These achievements are a consequence of expanding opportunities for education at all levels (Economic Planning Unit and UN Country Team, 2011).

Prior to 1990, male enrolment rates generally exceeded those of females. Since the beginning of the 1990s, female enrolment rates have exceeded those of males at all levels of education (Ministry of Women and Family Development, Malaysia, 2003). The proportion of females with tertiary education in the 2000 Population Census exceeded that of males for cohorts born after 1970 (Tey, 2006). There are more women than men with tertiary education in the labour force, in institutions of higher learning, and in most fields of study (Ministry of Education, 2003).³ In line with this, a previous study found that young labour market entrants with less than tertiary education are mostly male; those with tertiary education who are either unemployed, or in jobs that are not commensurate with their education, are mostly female (Nagaraj, Goh, Cheong, Tey & Jani, 2014). As a result,

¹ Malaysia's Third Outline Perspective Plan (OPP3) (Malaysia, 2001, p. 121) defines a knowledge-based economy as one characterised by an abundance of knowledge; increased mobility of workers and capital; worker contribution to ideas, skills and knowledge; and a shift from top-down hierarchical organisational structures to flatter, shared structures with increased worker participation in decision making.

² There are eight MDGs. Each goal has a set of targets and indicators designed as a 'road map' for achieving the MDGs. The MDGs were directed at the attainment of the economic, social, and cultural rights originally set forth in the Universal Declaration of Human Rights. With their adoption by all United Nations Member States in 2000, the Millennium Declaration and the Millennium Development Goals acted as a universal framework for development and a means for developing countries and their development partners to work together in pursuit of a shared future for all (UNDP, 2005).

³ Gender imbalance favouring females in education has been observed not just in Malaysia but in other countries as well, including developed countries like the United States, Canada, UK, Ireland, Australia and New Zealand (Coates & Draves, 2006; Riordan, 2003; Commonwealth of Australia, 2002). It has been observed at different levels of enrolment, in different racial/ethnic groups and even in fields of study previously dominated by males (Mortenson, 2001).

young labour market entrants had a greater presence in primary and secondary than in tertiary occupations.

The rosy picture of Malaysia's educational accomplishments thus conceals major challenges,⁴ especially for MDG Target 16 on the provision of decent and productive work for young people. This study is concerned with an especially difficult challenge, that of children who do not complete secondary school. Since most primary school-age children are in school, the analysis is focused on secondary school-age children. The study is also confined to Malaysian citizens as they can access the public education system for free for eleven years. The analyses are at the country level, providing a macro perspective of the problem. This is facilitated by the use of census data.

Exploration of changes across time provides insights into changes that are common to specific groups like gender in the population. The focus is on the gender dimension for two reasons. First, the provision of greater education benefits over time has been essentially gender-blind, but lack of discrimination has not prevented gender disparities in educational outcomes. Second, and perhaps much more importantly, the gender perspective enables unique insights into schooling. Given that the national education system comprises co-educational classrooms, the often-cited but important explanation of poverty for not completing school cannot be dramatically different across gender.

In the next section, we revisit the issue of gender imbalance in attrition⁵ from the school system to understand whether gender differentials in participation in education persist after accounting for changes in access to education. For this, the participation of males in education among those aged 5-22 in Peninsular Malaysia is examined across time using census data for 1970 – 2000 from IPUMS-International.⁶ The third section is concerned with Malaysian adolescents aged 11-18 who were not in school in the 2000 Census.⁷ Three questions of interest are considered: First, who are the adolescents who are not in school when they should be? Secondly, who are the adolescents not in school who work? And thirdly, what kinds of jobs are adolescents not in school doing? In the fourth section, we turn to studies that offer explanations for not completing school, highlighting findings that could lead to the observed gender differentials. We also consider briefly institutional responses to the problem of attrition. The fifth section discusses implications

⁴ Indeed, existing challenges were sufficiently daunting to warrant a warning in Malaysia's New Economic Model (National Economic Advisory Council, 2010, p. 6), a blueprint for the country in the decade beginning in 2011.

⁵ We use education indicators based on cumulative dropout rates derived from annual school cohort data (UNESCO Institute of Statistics, 2009). We do not consider explicitly the issue of truancy since it is seen as a disciplinary problem and thus an administrative issue. However, we note that dropouts must have been truants in the school system since that is defined by the number of days the student misses school before being expelled, and so we do refer to studies of this group.

⁶ Integrated Public Use Microdata Series (IPUMS) International is available at the Minnesota Population Center, University of Minnesota. Data for Malaysia are available for 1991 and 2000, and for Peninsular Malaysia from 1970-2000.

⁷ Adolescents aged 11-18 identified as 'not in school' had responses 'Schooling part-time', 'Completed schooling' or 'Never attended school', to the question on whether the individual had ever been to school/college/polytechnic/university. The census data was made available by the Department of Statistics, Malaysia. A sample for the 2010 Census was not available at the time of writing. The number of observations available for year 2000 was approximately twice that for the same year in the IPUMS-International dataset and permitted greater in-depth analysis.

and policy challenges. A summary concludes the paper.

It is important at this juncture to note the limitations of using census data. First, attrition rates are likely to be understated because information on schooling completion is most likely provided by parents or other adults in the household who either are not aware, or do not want to admit, to the child's absence from school. Secondly, a census sample limits the study of small groups in the population, like students who study and work. Thirdly, as noted in Section 3, our analyses are constrained by the variables available in the census sample. Fourthly, census data does not provide behavioural information. For example, we cannot establish from census data what adolescents not in school and not at work actually do with their time or, more importantly, their special circumstances that led to the decision to stop schooling.

2. Education and Gender: The Road to Imbalance

Given the common education system and the approximately equal share of males and females in the population, we can tease out information about children not in school by studying gender differentials.

Previous studies referred to above have shown that Malaysia's significant gains in educational attainment over the past forty years have been accompanied by a closing and then reversal of the gender gap. However, the slow uptake of secondary education and the consistent gender gap is best seen in cumulative dropout rates, or its complement, survival rates. Examining survival rates at year eleven of schooling from 1991-2004, 1980-1993 who completed secondary school year eleven in 1991-2004, Nagaraj, Goh, Tey and Lee (2008) found that although retention increased over time, only about 74.0% of the 1993 cohort was in school in 2004 (Figure 1).⁸ Boys were less likely to stay in school until year eleven (68.8%) compared to girls (79.6%). They found that while attrition occurs every year, it is greater at the points of major government examinations, and especially at years nine and eleven, and greater consistently for boys.⁹

More recent data on the cumulative dropout rate to the last grade of lower secondary general education (about nine years of schooling) shows values ranging from 5.9% to 22.4%, but there is nevertheless a continued pattern of male dropouts being greater than that of females (Figure 2).¹⁰ Since free schooling and automatic promotion through

⁸ The survival rate is for the entire primary and secondary school cycle of eleven years. The survival rate to year eleven was computed by tracing the cohort that enters year 1 for eleven years, accounting for "remove" classes (students who move from vernacular to national schools). The definition is the same but the calculation is slightly different from that in UNESCO guidelines (UNESCO Institute of Statistics, 2009).

⁹ These are: year six (end of primary school education, Ujian Penilaian Sekolah Rendah or Primary School Evaluation Test), year nine (Penilaian Menengah Rendah or Lower Secondary Assessment, taken at the end of Form 3, i.e. year nine – changes made to this system recently do not apply to the data of this study), and year eleven (Sijil Pelajaran Malaysia or Malaysian Education Certificate, equivalent to the GCE-O level examinations). After eleven years, students can, for a fee, do some form of post-secondary program that provides a pathway to a diploma or degree. Schooling in Malaysia, especially primary schooling can be at vernacular schools and it is pertinent to note that the study found the gender pattern to be true across all school types.

¹⁰ The cumulative dropout rate to a specific grade level is $(1 - \text{survival rate}) \times 100$, see UNESCO Institute of Statistics (2009). The annual dropout rate from secondary school shows a decline from 5.5% in 1995 to 2.0% in 2013 (Patel, 2014, Table 1).

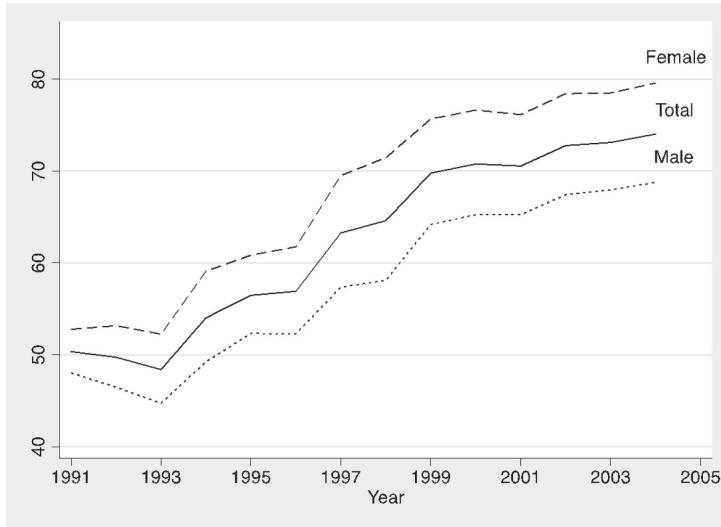


Figure 1: Survival rate to Year Eleven, Malaysia, 1991-2004

Source: Adapted from Figure 5, Nagaraj et al. (2008) which was for students in schools under the purview of the Ministry of Education. These are percentages of year one cohorts from 1980-1993 in year eleven. Data from various issues of Malaysia Educational Statistics, Ministry of Education, Malaysia.

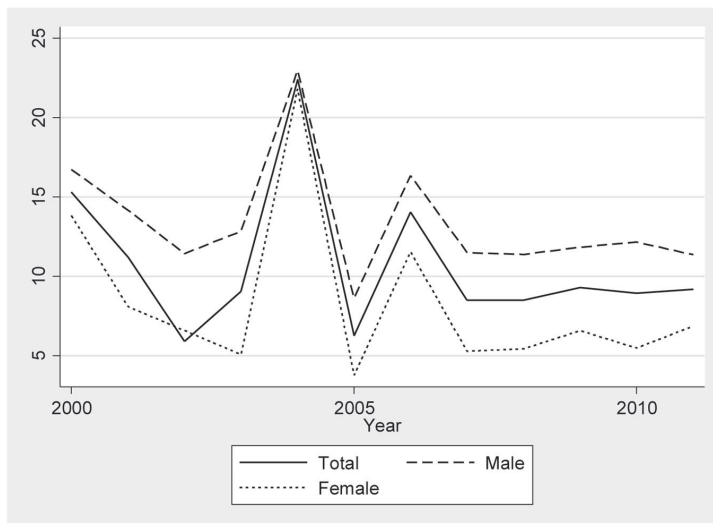


Figure 2: Cumulative dropout rate to the last grade of Lower Secondary General Education, Malaysia, 2000-2011

Source: Data from UNESCO Institute of Statistics <http://data.uis.unesco.org>

Table 1. Enrolment ratios and public expenditure on education, selected Asian countries, 2010

Year	Gross enrolment ratio, secondary	Gross enrolment ratio, tertiary	Public expenditure on education (% of GDP)
Malaysia	66.9	37.1	5.12
Hong Kong	87.2	57.8	3.51
Indonesia	78.4	24.9	3.00
Philippines	85.4**	29.4	2.65*
South Korea	97.1	101.0	4.67*
Thailand	83.5	50.0	3.75
Viet Nam	58.5	22.4	6.29

*2009 **2013

Source: UNESCO Institute of Statistics, from <http://data.uis.unesco.org>

secondary school are assurances of the education system, and enrolment in primary education is universal, the presence of low educational attainment suggests that student attrition in secondary school is a significant issue.

The impact of school attrition cannot be understated. For example, this attrition has led to Malaysia's enrolment rate at tertiary levels comparing unfavourably with some of her neighbours at lower levels of income per capita (Thailand at both secondary and tertiary levels, Indonesia at secondary level), and very unfavourably with Asian countries to whose income level Malaysia aspires (e.g., South Korea) (see Table 1).

Is this pattern of change in the gender differential still true if we control for access to education? Over the period of study, 1970-2000, access to education in terms of number of years of free education up till completion of secondary school as well as geographical spread to relatively inaccessible communities in lower socio-economic regions dramatically increased. In addition, ethnicity has over this same time period, been established as a (debilitating) pillar of the education system affecting access at all levels (see, for example, Lee & Nagaraj, 2011). Access to education may lead to gendered educational outcomes. For example, if schools are far from home, parents may prefer their daughters not travel the long distance alone or may not be able to afford transport to school. If access to education affects young males and females differently, then we expect to see differences in the pattern of change across time of the gender differential.

We examined the issue using census samples for Peninsular Malaysia for 1970 to 2000 accessed from IPUMS.¹¹ A logistic regression with clustered standard errors based on IPUMS data were used to estimate and then compare predicted net probabilities of a male being in the education system across time for Peninsular Malaysia (1970, 1980, 1991, 2000). Specifically, the regression was fit to whether the person in the education system is a male (a dichotomous variable) based on citizens aged 5-22. The explanatory vari-

¹¹ Stata 14 (StataCorp, 2015. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP) was used for estimation. For each year, the survey weights are the same per person, but the weights for 1980 are different from the other three; hence 'pweights' were used for estimation.

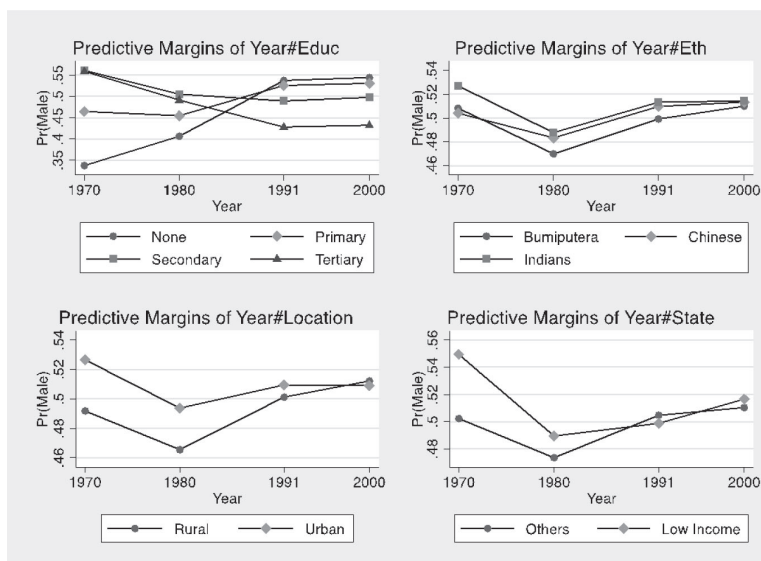


Figure 3: Predicted probability of a male being in the education system by educational level, ethnicity, location, state and year for citizens aged 5-18, Peninsular Malaysia, 1970-2000
 Source: Computed from a logistic regression estimated using IPUMS data

ables were year of census, current educational level (no schooling or unknown, primary, secondary, tertiary), rural-urban location, ethnicity (*Bumiputera*, Chinese, Indians), state (Kelantan, Perlis, Terengganu versus the rest), and two controls, age and number of children in the family.¹² Two-way interactions between year and educational level, ethnicity, state and rural-urban location and three-way interactions between education, year and location, and education, year and ethnicity were used to capture changes in educational structure across time. All variables and interactions were highly significant.

A snapshot of the changes over time in the predicted probability of a male being in the education system after accounting for changes in access for Peninsular Malaysia by educational level, ethnicity, rural-urban and state is shown in Figure 3.¹³ The gender gap reduces for all levels except for tertiary education where it reverses. Males were less likely in 1970, but more likely in 2000, than females to have no education, while the contrary is observed for tertiary education. Turning to ethnicity, location and state, the pattern of

¹² Children may begin year one when they are 5, 6 or 7. It takes 11 years to complete secondary schooling. Tertiary captures any post-secondary course, and we have provided four years for this, so the age group considered was 5-22. The ethnic groupings exclude other ethnicities because the "Others" group was too small being less than 1% of the sample in each year. In 1970, Perlis, Kelantan and Terengganu had the lowest mean number of autos, a proxy for income levels.

¹³ The predicted probability is the estimated average marginal effect. For example, the marginal effect for Year=1970, Education=None is the average predicted probability obtained by treating each observation in the data as if Year=1970 and Education=None, but all other values remain the same. The figure shows point estimates obtained using the margins command in Stata 14.

change in probability of being male across time is about the same: a decline to 1980 and then an increase to just greater than a half in 2000.

The analysis above shows that accounting for improved access does not change the finding that male participation in tertiary education has become lower than that of females over time. It does, however, show that across different strata that affect access to education, the change in the position of women across time has been one of similar and continuous improvement.

3. Adolescents: In School, Not in School and at Work

The consistent gains in educational attainment of women irrespective of strata with the lower presence of males in higher education imply that males leave school earlier than females. It is perplexing that in a public school system where free education is available for eleven years, children do not complete school. So what are the children who leave school doing? The evidence suggests that some of these children work (Ishak & Low, 2013; Rahimah & Suriati, 2013). We are also aware that some children get married despite laws that prohibit child marriages.¹⁴ Using data from a 2% sample of the 2000 Census,¹⁵ we explore the question in some depth. We focus on adolescents who are Malaysian citizens aged 11-18¹⁶ to determine (a) the characteristics that distinguish children who are in school from those who are not in school, (b) the characteristics of children not in school that distinguish those who work from those who do not work, and (c) the kind of occupations and industries that children not in school who work are in.

3.1 Who is Not in School

The percentage of adolescents aged 11-18 in school is shown in Table 2. Adolescents aged 11-14 are mostly in school (92.8%), but attrition can be clearly observed among children aged 15-18 (71.7%). Adolescents not in school may have completed schooling (the majority) or be schooling part-time or never been to school. Males were more likely than females to be not in school. About a third (30.3%) of adolescents aged 15-18 had no certificates. Males were more likely to have no certificate and less likely to have a SPM certificate.

To understand the effect of demographic characteristics and access to education, a logistic regression was used to estimate and then compare predicted net probabilities of being in school across age. Specifically, the regression was fit to a dichotomous variable that took on the value 1 if a child aged 11-18 was not in school. The explanatory variables were rural-urban location (1 if rural), ethnicity (Malay, Other *Bumiputera*, Chinese, Indians), state (1 if in East Malaysia), age, male, marital status (1 if ever married), educa-

¹⁴ Zainah Anwar, "Nothing divine in child marriage", *The Star*, June 6, 2010.

¹⁵ It would have been useful to examine further changes across time with a 2% sample of the 2010 Census. However, this was not available at the time of writing. The variables in the 2000 sample available to us had no proxies for income. A proxy for income, autos, is available in the IPUMS Census 2000 sample, but the variables for education available in the latter data set did not allow identification of children who were not in school.

¹⁶ As noted earlier, children may enter year one when 5, 6 or 7, complete primary education after six years and secondary education after a further five years. With universal education, the number of children under 11 not in school will be too few in number in a sample, so the study considers children aged 11-18.

Table 2. School attendance and achievement by gender, Malaysian citizens aged 11-18 (2000 Census)

Percentages	Gender	Aged 11-14	Aged 15-18
In School	Male	92.8	68.9
	Female	94.0	74.6
	Total	93.4	71.7
No Certificate	Male	-	31.2
	Female		29.3
	Total		30.3
Year 9 (PMR)	Male	-	52.1
	Female		52.8
	Total		52.4
Year 11 (SPM)	Male	-	14.8
	Female		16.3
	Total		15.6

Source: Computed from 2% sample of 2000 Census

tion (none, primary, PMR, SPM or higher) and work (1 if employed).¹⁷ Also included were two-way interactions between male and rural-urban location, marital status, and work, and a two-way interaction between education and ethnicity. Age squared was included to capture the non-linear increase in attrition as age increases. Most of the variables and interactions were highly significant.¹⁸

The predicted net probability (average marginal effect) of not being in school across age by gender, location, ethnicity and education is shown in Figure 4. As can be expected, the estimated net probability of not being in school increases as age increases, the increase growing with age across all strata. While both boys and girls drop out, boys are more likely to do so than girls, and the gender differential increases with age. The estimated net probability for rural locations whether in Peninsular Malaysia or East Malaysia are much higher than for urban locations across all ages, with again the differentials increasing with age. Interestingly, the estimated net probabilities for rural Peninsular Malaysia are not much higher than those for urban East Malaysia. Turning to ethnicity, we observe that estimated probabilities are highest for Other *Bumiputera* and least for Chinese, with again the differential for Other *Bumiputera* increasing sharply with age against other ethnic groups. Finally, the estimated net probability for primary education is the

¹⁷ The ethnic grouping, *Bumiputera*, comprises Malays and Other *Bumiputera*. Since the majority of the latter group is in East Malaysia, the analysis considered these two groups separately. Other ethnicities besides *Bumiputera*, Chinese and Indians were excluded because the 'Others' group was too small. The education variable combined information from two variables in the census. "Primary" was identified from the variable 'education' and certification from the variable 'cert'. SPM+ includes all certificates upward of the SPM. About 1.1% of children aged 11-18 was currently married, divorced, separated or widowed. Of these children, about 1 in 4 children were in school.

¹⁸ The exceptions were the ethnicity of Chinese (base: Malay) and terms in the education and ethnicity interactions, primary x Chinese, primary x Indians, PMR x Chinese, PMR x Indians (base: none x Malay).

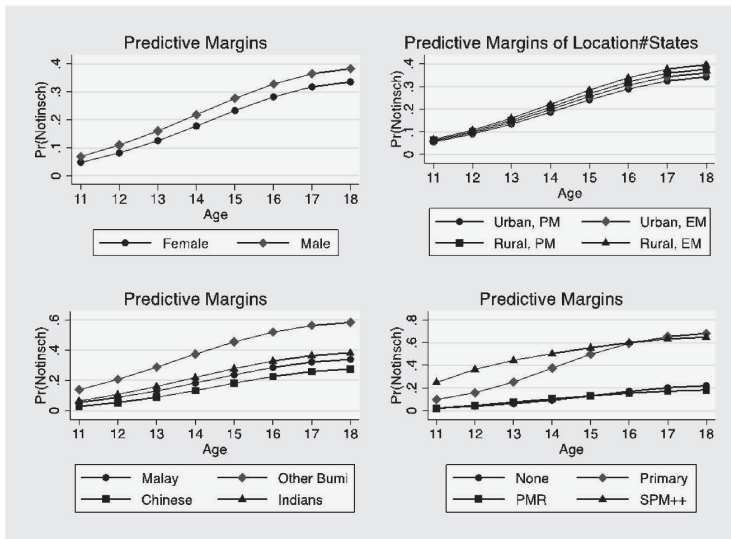


Figure 4: Predicted probability of Malaysian citizens aged 1-18 not being in school by gender, location, ethnicity and education, 2000

Source: Computed from a logistic regression estimated using 2% sample of 2000 Census

highest among the education categories, even higher than the value for those with a SPM certification or higher.

The older the child, the less likely he or she stays in school. A summary of the estimates is shown in Table 3 for age 18. At age 18, we are including adolescents who have had the opportunity to complete eleven years of schooling. About 1 in 3 girls aged 18 and 1 in 2.6 boys aged 18 are not in school. Areas with lower income or physical access like rural areas and especially in East Malaysia see higher probabilities of adolescents not in school. This ties in with the estimated probability being highest for Other *Bumiputera*, most of whom reside in East Malaysia. Among ethnic groups, the lowest is observed for Indians. The estimated probability of not being school is highest among those with primary education, even higher than those with SPM or higher level, some of whom we expect would have completed secondary schooling and will not continue to tertiary education.

3.2 Among Those Not in School, Who Work

We now turn our attention to adolescents not in school who are or wish to participate in the labour force. About 7.2% of adolescents aged 11-18 was employed. Of these adolescents, about 6.3% were still in school and although the issue of working while schooling is important, our focus is on the adolescents who were not in school. The labour force status of adolescents aged 11-18 who were not in school by gender is shown in Table 4. A much greater proportion of boys (44.0%) than girls (34.8%) were employed. The percentage was also greater for boys for the active and inactive unemployed but the differential is smaller.

Table 3. Actual and estimated probabilities of not being in school at age 18, Malaysia

	Actual	Estimated
Male	60.61	38.27
Female	54.54	33.27
Urban, Peninsular Malaysia	49.82	34.22
Urban, East Malaysia	54.75	36.08
Rural, Peninsular Malaysia	68.64	37.71
Rural, East Malaysia	78.12	39.67
Malay	65.69	33.97
Other <i>Bumiputera</i>	74.57	48.44
Chinese	34.17	27.53
Indians	52.64	38.26
None	100.00*	22.01
Primary	100.00*	68.19
PMR	33.57	18.13
SPM or higher	62.18	64.93

*None of those with none or primary education aged 18 were in school

Table 4. Labour force status of Malaysian children aged 11-18 not in school, 2000

	Male	Females	Total
Employed	44.00	34.80	39.96
Active unemployed	5.70	5.20	5.48
Inactive unemployed	13.00	12.46	12.77
Outside labour force	35.55	45.88	40.10
Unknown	1.73	1.65	1.70
Total	100.00	100.00	100.00

To understand the net effect of different covariates on the likelihood of working (that is, employed) among those not in school, a logistic regression was used to estimate and then compare predicted net probabilities of working across age. Specifically, the regression was fit to work, a dichotomous variable that took on the value 1 if a child aged 11-18 was working. The explanatory variables were gender, rural-urban location (1 if rural), ethnicity (Malay, Other *Bumiputera*, Chinese, Indians), state (1 if in East Malaysia), age, marital status (1 if ever married)¹⁹ and education (none, primary, PMR, SPM+). Also included were two-way interactions between marital status and gender, ethnicity and education,

¹⁹ Among those not in school, a greater proportion of boys (98.5%) than girls (91.0%) were never married. Girls were not only more likely to be married, there were children who had experienced widowhood or divorce/separation.

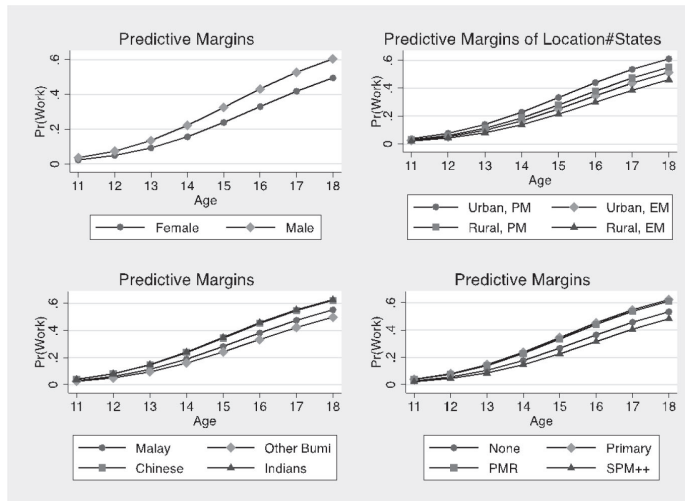


Figure 5. Predicted probability of work among Malaysian children aged 11-18 not in school by gender, marriage, education, location and states, 2000

Source: Computed from a logistic regression estimated using 2% sample of 2000 Census.

Note: Predictive margins for Chinese and Indians, and for Primary and PMR across age are similar and hence overlaid.

and rural-urban location and state. Age squared was included to capture the non-linear increase in attrition as age increases. Most of the variables and interactions were highly significant.²⁰

The predicted net probability (average marginal effect) of working across age by gender, location, ethnicity and education is shown in Figure 5. As is to be expected, the estimated net probability of working as age increases, the increase growing with age across all strata. While both boys and girls drop out, boys are more likely to do so than girls, and the gender differential increases with age. The estimated net probability for locations whether urban or rural are much lower in East Malaysia across all ages. Turning to ethnicity, we observe that estimated probabilities are highest for Other *Bumiputera* and least for Chinese, with again the differential for Other *Bumiputera* increasing sharply with age against other ethnic groups. Finally, the estimated net probability for primary education and PMR is greater than that for those with no education or with an SPM+ certificate.

The older the child not in school, the more likely he or she is at work. A summary of the estimates is shown in Table 5 for age 18. About 1 in 2 girls aged 18 and 1 in 1.6 boys aged 18 work. Adolescents in states in Peninsular Malaysia, whether urban or rural, see higher probabilities of adolescents working. Among ethnic groups, the highest probabilities are observed for Chinese and Indians. The estimated probability of working is highest among those with primary education and PMR.

²⁰ The exceptions were the ethnic Indians (base: Malays), "SPM+" (base: none) and three terms in the education and ethnicity interactions, primary x Chinese, PMR x Indians and SPM+ x Indians (base: none x Malay).

Table 5. Actual and estimated probabilities of working among those Malaysian citizens aged 18, not in school

	Actual	Estimated
Male	57.86	60.43
Female	45.97	49.50
Urban, Peninsular Malaysia	59.40	61.02
Urban, East Malaysia	45.27	51.27
Rural, Peninsular Malaysia	50.61	54.96
Rural, East Malaysia	36.20	46.09
Malay	53.36	55.24
Other <i>Bumiputera</i>	39.71	49.80
Chinese	59.49	62.17
Indians	59.03	62.78
None	63.30	53.40
Primary	54.92	62.33
PMR	60.29	61.23
SPM or higher	47.64	48.35

Source: Computed from 2% sample of 2000 Population Census

3.3 The Adolescent in the Labour Force

Given the significance of the school dropout problem, the issue of participation in the labour force is particularly relevant for policy. Unemployment is particularly significant. The percentage of adolescents aged 11-18 not in school but in the labour force in 2000 who were actively or inactively unemployed was 29.6% in contrast to the percentage for those in the labour force aged 15-65 of 5.2%. The problem was more acute in East Malaysia at 36.1% for adolescents aged 11-18, although that characteristic was not unique to them. The percentage for those aged 15-65 for East Malaysia (8.75%) was more than twice that for Peninsular Malaysia (4.29%).

For those aged 11-18 not in school in the 2000 Census that were working, 71.2% had a PMR or SPM or higher certificate and 58.8% were male. Table 6 shows the occupational categories and Table 7 the industry sectors in which the adolescents were working.²¹ Adolescents were least likely to be in occupational category 9 (elementary occupations, 13.9%) or in occupational categories 1-4 (clerical, technical or managerial, 14.6%) and most likely to be in occupational category 8 (plant and machine operators and assemblers, 26.0%) or in occupational categories 6 and 7 (skilled agricultural and fishery workers or craft and trades workers, 26.1%). They were least likely to be in industry sectors, 1, 2 or 5 (agriculture, hunting, forestry, fishing, mining, quarrying, electricity, gas and water indus-

²¹ Children could be found in diverse occupations and sectors. Here the groupings have been formed so that each category is of a reasonable size, or where the gender or certificate distinctions are apparent.

Table 6. Distribution of occupations of Malaysian citizens aged 11-18 not in school by category of percentage with a certificate and percentage male, 2000

Occupational category	Total (%)	With Certificate (%)	Male (%)
Clerical, technical, managerial (Categories 1- 4)	14.60	86.68	47.86
Service workers and shop and market sales workers (Category 5)	19.45	65.80	49.14
Skilled agricultural and fishery workers, craft and related trades workers (Categories 6,7)	26.05	45.71	82.95
Plant and machine operators and assemblers (Category 8)	26.03	78.69	49.45
Elementary occupations (Category 9)	13.88	56.57	75.78
Total	100.00	65.69	61.54

Source: Computed from 2% sample of 2000 Population Census

try sectors, 0.5%) and most likely to be industry sector 3 (manufacturing, 40.7%) or industry sector 7 (wholesale and retail trade, repair of motor vehicles, motorcycles, personal and household, goods and hotels and restaurants, 28.8%). The distribution is explained to some extent by educational level and by gender, both also shown in Tables 6 and 7. The percentage of adolescents with some certification was greatest in occupational categories 1-4 (clerical, technical or managerial, 86.7%) and least in occupational categories 6 and 7 (skilled agricultural and fishery workers or craft and trades workers, 45.7%). As for sectors, the percentage of adolescents with some certification was greatest in industry sectors, 1, 2 or 5 (agriculture, hunting, forestry, fishing, mining, quarrying, electricity, gas and water, 77.8%) and lowest in industry sectors 4 or 6 (construction, transport, storage and communications, 63.6%). Turning to gender, the percentage of males was greatest in occupational categories 6 and 7 (skilled agricultural and fishery workers or craft and trades workers, 83.0%) and lowest in the in occupational categories 1-4 (clerical, technical or managerial, 47.9%). The percentage of males was highest in the construction, transport, storage & communication sectors (92.4%) and lowest in financial intermediation, real estate, renting, business activities, and other services sectors (50.8%).

If we group the occupational categories into two categories, one with lower than average percentages of adolescents with certificates, and the other with higher, we can examine the effect of gender on the probability of being in either category net of other covariates. We fit a logistic regression to Occ, a dichotomous variable that takes on the value 1 if an adolescent aged 11-18 who is not in school and working is employed in occupational categories 1 to 4 or 8 (clerical, technical, managerial, plant or machine operators

Table 7. Distribution of industry by sectors of Malaysian citizens aged 11-18 not in school, percentage with a certificate and percentage male, 2000

Sector	Total (%)	With Certificate (%)	Male (%)
Agriculture, Hunting, Forestry & Fishing, Mining & Quarrying, Electricity, Gas & Water (1, 2, 5)	0.47	77.78	88.89
Manufacturing (3)	40.70	76.89	51.47
Construction, Transport, Storage & Communications (4, 6)	9.87	63.59	92.35
Wholesale & Retail Trade, Repair of Motor Vehicles, Motorcycles, Personal & Household, Goods and Hotels & Restaurants (7)	28.84	66.58	62.60
Financial Intermediation, Real Estate, Renting, Business Activities, Other Services (8, 9)	20.11	69.69	50.78
Total	100.00	71.16	58.75

Source: Computed from 2% sample of 2000 Population Census

or assemblers). The explanatory variables were gender, rural-urban location (1 if rural), ethnicity (Malay, Other *Bumiputera*, Chinese, Indians), state (1 if in East Malaysia), age, education (primary or less, PMR, SPM or higher) and industry (1 if sectors 1, 2, 5; 2 if sector 3; 3 if sector 4 or 6; 4 if sector 8 or 9; see Table 7). A three-way interaction between gender, state and education was included. Most of the variables were significant.²²

The predicted net probability (average marginal effect) of working in occupational categories 1-4 or 8 by gender, industry, ethnicity, education and location x states is shown in Figure 6. As is to be expected, the estimated net probability is greater for females compared to males, and greater the higher the educational level. The estimated net probability is highest for industry grouping 2, which is manufacturing, and lowest for industry grouping 1. Turning to ethnicity, the probability is highest for Malays and Indians. Net probabilities are lowest for rural East Malaysia and interestingly the differential between males in East and Peninsular Malaysia is much smaller than the corresponding one for females. In term of Peninsular Malaysia compared to East Malaysia, females do better than males in both. While both boys and girls drop out, boys are more likely to do so than girls, and the gender differential increases with age. The estimated net probability for locations whether urban or rural are much lower in East Malaysia across all ages. Turning to ethnicity, we observe that estimated probabilities are highest for Other *Bumiputera* and least for Chinese, with again the differential for Other *Bumiputera* increasing sharply with age

²² Age, ethnic Indians (base: Malays) and all the three-way interactions except male x PM x SPM+ were not significant at 10% or less.

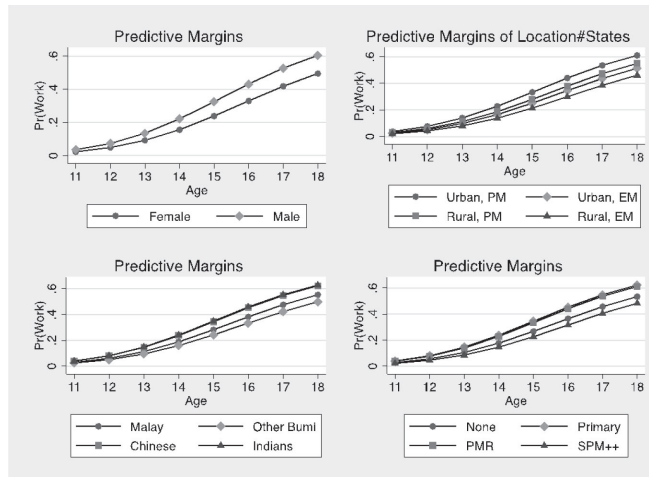


Figure 6. Predicted probability of being in occupational categories 1 – 4 or 8 among Malaysian children aged 11-18 not in school who are working by gender, education, industry, ethnicity, location and states, 2000

Source: Computed from a logistic regression estimated using 2% sample of 2000 Census

against other ethnic groups. Finally, the estimated net probability for primary education and PMR is greater than that for those with no education or with SPM qualification or higher.

3.4 Summary

On average, about 18.6% of adolescents aged 11-18 were out of school in 2000, and the attrition increased with age. About 13% of the adolescents out of school did not stay in school long enough, or were not able, to get a PMR certificate. Of adolescents in this age group, boys were more likely than girls to be out of school, and more likely to be working. *Other Bumiputera* adolescents were more likely out of school, and also more likely not to be working. Rural adolescents and children in East Malaysia were more likely to be out of school, and also more likely not to be working. In contrast, those with primary education were not only more likely to be out of school, they were also more likely to be working, as were those with a PMR certificate.

Of those not in school, about 58.2% were in the labour force. Of these, about 79% were working. Not unexpectedly, they were less visible in occupational sectors 1 – 4 (14.6%), which comprise occupations that usually require higher levels of education, compared to the general population aged 15-64 (34.5%). Almost half of these youth were in occupational categories 6, 7 and 8 (52.1%), which comprise occupations that do not usually require much education, a much higher percentage than that in the general population aged 15-64 (39.4%).

Considering adolescents not in school, about 4.7% were married and of these married adolescents, about 27.7% were in the labour force. Child marriage is not the focus of this paper, but clearly it is an issue. About 38.5% were neither in the labour force nor

Table 8. Percentage of Malaysian citizens aged 5-14 who have completed schooling by stratum and sex, 2010

Stratum	Males aged 5-9	Males aged 10-14	Females aged 5-9	Females aged 10-14
All	0.35	4.65	0.28	4.08
Urban	0.36	3.75	0.28	3.38
Rural	0.33	6.44	0.28	5.51

Source: Computed from Table 2.1, Department of Statistics, Malaysia (2013).

married. Of this group, about 50.0% were male, 62.5% were in urban areas, 81.8% were in Peninsular Malaysia and about 71.2% had no certificate. We are not able to establish what these adolescents are doing but this is a group that needs considerable support to ensure they become productive and useful citizens.

This discussion has been based on the 2000 Census. Is the gender differential still a problem in recent years? Table 8 shows the percentage of children aged 5-9 and 10-14 who are recorded as having completed schooling in the recent 2010 Census. These would be children who should be in school. We observe that the percentage for males is greater than for females, irrespective of strata. Indeed, the gender differential continues to persist.

4. The Tragedy of Attrition: Responses and Explanations

Malaysia has been long concerned with dropouts and children not in school (see, for example, Lee, 1984). A comprehensive study was carried in 1973 (Ministry of Education, Malaysia, 1973) (MOE), and there have been several small but in-depth studies carried out by researchers both within and outside the MOE. Malaysia is also an active collaborator in the 'Reaching The Unreached Children in Education In Asia-Pacific' (UNESCO, 2010) effort that covers citizen, stateless and non-citizen children aged 6 – 12 years old.

4.1 Institutional Responses

The Dropout Study (Ministry of Education, Malaysia, 1973) proposed a number of policies and programs that led to the provision of financial assistance to poor children in the form of stipends, bursaries and scholarships, health programs, dental health programs, food programs, free textbooks or book loans, as well as free schooling through secondary education. Other studies have led to programs addressing specific communities like the *Orang Asli* that have been identified as needing greater intervention (see, for example, Nor et al., 2011). In recent years, measures to reduce dropout rate include improving literacy and numeracy skills (Malaysia, 2010, pp. 200-203). Other measures to reduce the dropout rate include adult education for parents, additional professional development for teachers in high-dropout schools, in-service teacher training aimed at improving literacy and numeracy skills of poor children and the teaching skills of the teachers (Nor et al., 2011).

One response to youths who are not academically inclined is the provision of technical and vocational education and training (TVET). However, students generally have a

low perception of the upper secondary technical and vocational schools, perceptions that are reinforced by the lower entry requirements into these schools, and the stigma that these schools are meant for low achievers (Awang et al., 2011; Khalid, 2015). Parents who value technical and vocational skills do not think these schools are capable of imparting the needed skills set (see also Patel, 2014, Chart 7). The TVET program targets school dropouts (Ministry of Education, Malaysia, 2013b, pp. 3-20; UNICEF, 2013, p. 9), rather than seeing TVET as an avenue for all who are inclined towards applied science and technology. So despite opening up pathways for those from TVET to progress all the way to postgraduate study and the introduction programs such as the National Dual Training System (NDTS), a system where 70% of training would be done in industry and 30% in TVET institutions (Malaysia, 2010, p. 222), TVET is not seen as attractive. Moreover, the supply of TVET continues to lag far behind the number of applicants, at least where the public sector Vocational Colleges are concerned (Ministry of Education, Malaysia, 2013a, p. 30; Ministry of Education, Malaysia, 2013b). Malaysia's TVET system remains fragmented with uncoordinated governance, competency gaps among instructors, and a lack of accountability for results (Malaysia, 2015, pp. 5-19 – 5-22; Economic Planning Unit, n.d). Sound TVET workforce development calls for a systems approach backed by high competency assurance and accountability for results (Cheong, Singaravelloo, Lee, & Noh, 2013).

4.2 Explaining Attrition

Studies have considered dropouts (students who have left school) and truancy (a disciplinary problem of staying away from school without permission). The latter is a definition that is time-based; after three warnings and forty days of staying away from school, the student may be expelled from the school. The distinction between the two categories is really administrative, and hence we include studies of truancy in this review. The distinction does however have an impact on the type of questions asked or even of the sample studied and hence on policy prescriptions, the former with a focus on low-income families and the latter on issues in school. However, there has been no attention paid to the fact that attrition has a distinct gender dimension, so for that we draw on studies conducted elsewhere.

One commonly cited reason for dropping-out of public school, and a focus of program intervention as seen above, is poverty (Burra, 1989; Ministry of Education, Malaysia, 2003, pp. 2-8). In a study of 26 child workers in Tawau, Sabah in 2008, just over a half of those surveyed cited economic reasons (Rahimah & Suriati, 2013). Our analyses in Section 3 above have also shown consistently that rural areas and places in East Malaysia are more likely to see adolescents out of school and unemployed. However, the explanation is not so much poverty as much as relative poverty arising from the relatively high private costs of education. While the costs to the individuals of public schooling are nominal, other related private expenditures like food, transport, uniforms, stationeries and books, and possible foregone earnings are not.²³ Thus, the family situation could be a reason for staying out of school especially if costs of education compare unfavourably with earn-

²³ From 2008, all Malaysian children in primary school were eligible for free textbooks. However, this facility was available only to a portion of the community in previous years. Non-citizens have to pay for public education, and that too only if they are in the country legally.

ings potential, as seen elsewhere (Nanjunda & Annapurna, 2006; Woldehanna, Jones, & Tefera, 2006).

Notwithstanding the impact of poverty, the remarkable consistencies in gender differentials irrespective of strata observed in educational levels, educational attainment and attrition suggest the existence of underlying systemic causes that goes beyond poverty. Girls perform better academically (Ministry of Education, Malaysia, 2013b, Exhibit 3-26), and hence are more likely to complete education all the way to tertiary levels. Zaini, Loh, Nagaraj, Daniel, & Marohaini (2004) in a study of academic achievement of primary school children in Selangor found that the typical Malaysian classroom is probably best suited to the kinesthetic learner, which many (thankfully) pupils were, while the visual learner suffers most. Furthermore, they found that once IQ scores and learning styles are taken into account, there was no difference between male and female academic performance. Evidence also suggests that boys are slightly better in spatial-rotational cognition while the verbal ability of girls is generally better, features that can lead to differences in academic achievement, particularly among high performing students (Kafer, 2007). At the same time, studies have shown that while boys and girls have similar problems in school, girls are better able to deal with them more effectively (von Drehle, 2007; Mortenson, 1999, Rusdi, Zuraini, Muhammad, & Mohamad, 2008). It may well be that the coping skills that girls have are better suited to the way education is delivered in school today.

The evidence thus points directly to issues in the Malaysian classroom.²⁴ Ishak and Low (2013) found in a study of 472 13-16-year-old truants identified from public schools with high rates of truancy (and 68.2% of whom was male) that, across the three ethnic groups, Malays, Chinese and Indians, constructs for teacher personality (too academic oriented, hot-tempered, etc.) and the school environment (autocratic school policy, etc.) were the most important factors in explaining truancy. A report on the views of about 50 adolescents attending the National Association of Gifted Children, Malaysia's Young People's Workshop (YPW) on school found that two issues were consistently raised about teachers: racism and favouritism (Nagaraj, 2006).²⁵ A recent OECD report also noted that teachers were weakest in fundamental qualities (intellectual, social, communication, numeracy), a reflection of the inability to attract the most able candidates (OECD, 2013).

Rahimah and Suriati (2013) noted that 12 of the 26 child workers they surveyed cited 'by choice/ independence' and 'parents encouragement' for working, while Patel (2014) found that 72% of the 150 parents in her sample gave the reason 'lack of interest in school', many of whom also noted their child's poor academic achievement. We expect that poor achievement and lack of interest are likely to reinforce each other. Rahimah and

²⁴ We note that reasons outside the classroom have also been put forward for the observed gender shift in favour of females. Studies have found that the returns associated with an investment in especially higher education are higher for females than for males (Goh & Rohana, 2009) and that opportunities for work for those without higher education are not good for females (Jacob, 2002). Changes in the structure of the economy from agriculture to industry leading to changes in the labour market, the changing status of women in society and even possibly a pro-female policy that ignores the boys have also been extended as possible explanations (Mortenson, 1999; Commonwealth of Australia, 2002).

²⁵ The writer, an adolescent at the time, entreats, "It cannot be denied that our school system has room for improvement. It also cannot be denied that our school system has produced some of the finest students. Why should we settle for anything less than the best?"

Suriati (2013) also found that 21 of the 26 children were not aware that they had a right to education. With the rapid expansion of the economy in the 1990s, and the access to technology, school may actually be uninteresting for those (mostly boys) who find the world of technology more exciting (Coates & Draves, 2006; Kleinfeld, 1998). The Ministry of Education has made great efforts to bring ICT to schools (Ministry of Education, Malaysia, 2003), but given the speed of technology uptake, schools will inevitably lag behind, and whatever facilities they have will be available to students only as part of a class schedule. Furthermore, the TVET experience tells us that institutional responses should not target low achievement for this not only leads to low expectations of a well-intentioned program, it fails to assist potential target students who, for example in this case are inclined to applied science and technology.

5. The Tragedy of Attrition: Consequences and Challenges

In the light of Malaysia's drive to break free from the 'middle-income trap', the findings in this paper point to daunting challenges. Attrition at secondary school level reduces the number of students entering tertiary education resulting in an under-qualified human capital stock with unrealised potential.

Attrition reduces the quality of human capital stock, a concern mentioned in the *New Economic Model*, referred to earlier (NEAC, 2010, p.6). Despite the provision of free schooling for eleven years, completion rates for secondary schooling are not rising fast enough. A decade after the data used for this paper, it was reported that 80% of the country's workforce are educated only up to secondary level (NEAC, 2010, p. 42). This explains why, despite Malaysia's hefty expenditure on education (in relation to its GDP), enrolment at tertiary institutions is smaller than can be expected at its level of economic development (Cheong, Selvaratnam, & Goh, 2011; Yusuf & Nabeshima, 2009). Attrition that leaves a considerable number of children out of school with little or no education and looking for work represents not just a loss of human potential, but also a burden on society if these children cannot become productive and useful adults. The danger posed by the human resource deficiency is of restraining Malaysia's long-term growth and compromising its competitiveness against rapidly improving neighbours like Indonesia and Vietnam.

The consistent pattern of gender differentials in educational participation across rural-urban locations, in East or Peninsular Malaysia or the various ethnic groups, points directly to critical deficits in the classroom. It is not enough to provide schooling through to the end of lower-secondary schooling and now through to the end of upper-secondary schooling. The contribution of the country's human capital to economic development depends not only on how many are educated and how long they are educated, but also on how many of those educated can find employment and the type of jobs they can take up. Both the number of years of schooling and what is learned are critical (Hanushek & Woessman, 2008; 2012; Breton, 2011).

The education system produces youths who fall far behind their counterparts in Asia. This is true of both what students know and how prepared they are to use those skills in the world of work. Deterioration in scores between 2009 and 2011/2012 can be observed for TIMSS mathematics and science scores, which tell us about what students know, and PISA reading scores, which tell us how prepared students are to apply these skills in the

Table 9. TIMSS scores for mathematics and science, 8th graders, selected countries and years

Year	Mathematics		Science	
	1999	2011	1999	2011
Malaysia	519	440	492	426
Singapore	604	611	568	590
Hong Kong	582	586	530	535
South Korea	587	613	549	560
Taiwan	585	609	569	564
Indonesia	403	386	435	406
Philippines	345	-	345	-
Thailand	467	427	482	451

Source: 1999: https://nces.ed.gov/TIMSS/results99_1.asp;
2011: https://nces.ed.gov/TIMSS/table11_3.asp, https://nces.ed.gov/TIMSS/table11_5.asp.

Table 10. PISA Scores, mathematics, science and reading, 15 year-olds, selected countries and years

	Mathematics		Science		Reading		Problem-Solving
	2009	2012	2009	2012	2009	2012	2012
Malaysia	404*	421	422	420	414	398	422
Singapore	562	573	542	551	526	542	562
Hong Kong	555	561	549	555	533	545	540
South Korea	548	554	538	538	539	536	561
Taiwan	543	560	520	523	495	523	534
Indonesia	371	375	383	382	402	396	
Vietnam		511		528		508	
Thailand	419	427	425	444	421	441	

*: Data for Malaysia is for 2010.

Source:

http://www.recsam.edu.my/pisa/Keynote_Address_2_Dr.Azian.pdf;
https://nces.ed.gov/surveys/pisa/pisa2012/pisa2012highlights_3a.asp;
https://nces.ed.gov/surveys/pisa/pisa2012/pisa2012highlights_4a.asp;
https://nces.ed.gov/surveys/pisa/pisa2012/pisa2012highlights_5a.asp;
<http://www.oecd.org/pisa/keyfindings/PISA-2012-results-volume-V.pdf>

workplace (Tables 9 and 10).²⁶ Furthermore, compared to some of her neighbours, Malaysia's scores in 2012 for TIMSS as well as PISA were lowest or second lowest for creative problem solving skills, reading, mathematics and science, all competencies critical to the growth of a knowledge-based economy.

²⁶ TIMSS assesses knowledge while PISA assesses the ability to apply the acquired knowledge for full participation in the world of work (Grønmo & Olsen 2006; Di Giacomo, Fishbein, & Buckley, 2013).

The present education system is compromised. As we have seen, there is considerable attrition from an education system that seeks to provide schooling for eleven years. At the other extreme, there is an oversupply of graduates that is reflected in high graduate unemployment rate coexisting with the inability on the part of private sector employers to fill vacancies in science and technical jobs (OECD, 2013; Nagaraj et al., 2014). And in the middle, as noted above, children in school do not perform as well as their neighbours in nearby countries in mathematics and science. All of these issues have distinct gender differentials. Most importantly, the issues underlying attrition contribute to the cycle of mediocrity that characterises the crisis in education (Lee & Nagaraj, 2011). The input into the teaching profession in both schools and local universities will increasingly come from that middle group that has not been trained as well as it could have been.

We need educational reform urgently at the classroom level. Although there is mention of the development of a child's potential in the *Education Development Plan, 2001-2010* (Ministry of Education, Malaysia, 2003), the plan makes no mention of an educational philosophy that is child-centred or classroom-centred, or of gender issues. A complete discussion of policies is beyond the scope of this paper, and some of us have made recommendations elsewhere (Nagaraj, Lee, Chew, & Ahmad, 2009). However, we note that it is time to move away from seeing the problem of attrition as one of discipline in the classroom (truancy) and instead as one of encouraging 'attachment in the classroom'. What goes on in classrooms that makes for high student achievement has little to do with traditional measures of teacher quality (such as certification and academic major/minor) but more to do with often unobserved teacher and school characteristics (Geo & Stickler 2008; Aslam & Kingdon, 2011).

Black and William (1998) famously observe that "Learning is driven by what teachers and pupils do in classrooms," and depict this as a 'black box,' a term borrowed from the engineering literature. To a very large extent, the elements in the black box that work, the key elements of 'attachment in the classroom' identified in more recent studies (Bergin & Bergin, 2009; McCormiccappella et al., 2013; McDougall, Saunders, & Goldenburg, 2007), are the same as those that have been identified in the case of the high-poverty high-performing schools (Carter, 2000; Calkins, Guenther, Belfiore, & Lash, 2007). Interestingly, these findings cut across countries (Barber & Mourshed, 2007).

Shannon and Bylsma (2005) note that students' engagement in school results from their need for competence, experience of membership in the school, and the authenticity of the work they are asked to complete, that is, pedagogy should be 'authentic and adaptive' (Newmann & Associates, 1996; Darling-Hammond, 2002; Newmann, King, & Carmichael, 2007). Teachers, selected from among the best, should ensure a respectful and conducive environment that takes into account different learning styles, and diversity across gender, ethnic, cultural and income lines through differentiated instruction (Banks et al., 2000) and individualised curricula (Senge et al., 2000). This requires that teachers be given greater responsibility within the classroom to develop the learning community that is the classroom. The curriculum needs to be made more flexible so that vocational and technical options are not seen as lowly options outside the system they entered in year one, but courses that can be taken as part of that system.

6. Concluding Remarks

Malaysia is committed to bringing education to its children, and over the past 30 years has seen tremendous gains in educational attainment of the population as well as poverty reduction. Education policies have provided equal access to both girls and boys for eleven years of education. Thanks to these policies, Malaysia appears to have achieved the MDG for education. The picture portrayed in this paper, however, is a strong reminder that the achievement of quantitative targets is a necessary but not sufficient condition for the country's long-term development.

We have found that accounting for the different strata that affect access to education (specifically, location and ethnicity) across time does not change the outcome, that is, male participation in tertiary education is now lower than that of females. Lack of participation in tertiary education is a consequence of reduced participation in secondary school. About 1 in 5 adolescents aged 11-18 in the 2000 Census was not in school, with the proportion increasing with age. Among these adolescents not in school, more than half was in the labour force. Boys were more likely than girls to be out of school, and more likely to be in the labour force. Not unexpectedly, compared to the general population these young persons were more likely to be unemployed or if working, more likely to be employed in lower skilled jobs. Labour force participation varied by location, gender and ethnicity. Urban adolescents were more likely to be unemployed. Other *Bumiputera*, rural or East Malaysian adolescents were more likely to be out of school, and also more likely not to be working. Finally, among adolescents aged 11-18 not in school, more than a third were neither working nor married. Of this group, more than half (62.5%) was in urban areas.

Although the discussion was limited to a single age group – that from which secondary school students are drawn – the ramifications of its findings are country-wide. Attrition at secondary school level not only reduces the quality of human capital stock, it results in human capital stock with unrealised potential. This modest human capital base has further been depleted by outmigration of skilled labour, many educated up to tertiary level.²⁷ More importantly, the findings, in particular the consistent gender differentials across different indicators and different strata of society, are an indication of critical deficits in the classroom. Furthermore, closing the gender gap in education has not raised women's position in society relative to women's position in other countries. Between 2006 and 2014, Malaysia's overall gender gap index score increased marginally from 0.651 to 0.652 but its ranking decreased from 72 to 107 (World Economic Forum, 2014, Table 3 & p. 254).²⁸

Malaysia is handicapped by a quality of schooling that is lower and declining compared to the quality in the countries Malaysia aspires to catch up and compete with. We

²⁷ The NEAC Report (2010, p. 42) noted: "A disastrous exodus of human capital has flowed from the perception that in Malaysia's labour markets, rewards have historically not been commensurate with skills, achievements, and merit. Perhaps half a million talented Malaysians now live and work outside the country — 50% of them educated up to tertiary level, all embodying valuable skills no longer available to contribute to economic development in the country."

²⁸ The number of countries being ranked increased from 115 in 2006 to 142 in 2014. While Malaysia scores highly on educational attainment, wage equality and health, it ranks lower in labour force participation. However, the lower ranking is due the decline in the score for political empowerment.

have briefly discussed the type of changes that must occur inside the classroom so that the learning experience reaches all children. Children must be made aware of their rights to education so they will make use of schooling to better themselves. Clearly, the centralised education system has failed these adolescents.

Any solution adopted must not, however, undermine the gains made by girls. It is time to move away from gender-blind and ethnically-aware policies for education and focus on developing each child in the classroom. Educational provisions must be widened in scope and content to bring children who have left the national education system into educational programs that are geared to developing their potential. Unless educational reform policies are directed at the black box that generates learning in the classroom, Malaysia will find it difficult to maintain its competitiveness in the world economy.

References

- Aslam, M., & Kingdon, G. (2011). What can teachers do to raise pupil achievement. *Economics of Education Review*, 30(3), 559-574.
- Awang, A. H., Sail, R.M., Alavi, K., & Ismail, I.A. (2011). Image and students' loyalty towards technical and vocational education and training. *Journal of Technical Education and Training*, 3(1), 13-28.
- Barber, M., & Mourshed, M. (2007). *How the world's best-performing school systems come out on top*. London: McKinsey and Company.
- Banks, J. A., Cookson, P., Gay, G., Hawley, W., Irvine, J.J., Nieto, S., Schofield, J.W., & Stephan, W.G. (2000). *Diversity within unity: Essential principles for teaching and learning in a multicultural society*. Seattle, WA: Center for Multicultural Education, College of Education, University of Washington.
- Bergin, C., & Bergin, D. (2009). Review article: Attachment in the classroom. *Educational Psychology Review*, 21(2), 141-170.
- Black, P., & William, D. (1998). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, October, 139-148.
- Breton, T. R. (2011). The quality vs. the quantity of schooling: What drives economic growth? *Economics of Education Review*, 30(4), 765-773.
- Burra, N. (1989). *Issues emerging from the experiences of some developing countries of Asia*. Paris: UNESCO-UNICEF.
- Calkins, A., Guenther, W., Belfiore, G., & Lash, D. (2007). *The turnaround challenge: Why America's best opportunity to dramatically improve student achievement lies in our worst-performing schools*. Boston: Mass Insight Education and Research Institute.
- Carter, S.C. (2000). *No excuses: Lessons from 21 high-performing, high-poverty schools*. Washington, DC: Heritage Foundation.
- Cheong, K.C., Selvaratnam, V., & Goh, K.L. (2011). Education and human capital formation. In R. Rasiah (Ed.), *Malaysian economy: Unfolding growth and social change* (pp. 159-184). Kuala Lumpur: Oxford University Press
- Cheong, K.C., Singaravelloo, K., Lee, H.A., & Noh, A. (2013). *Malaysia: Workforce development: SABER country report 2013*. Washington, DC: World Bank. Retrieved from http://wbfiles.worldbank.org/documents/hdn/ed/saber/supporting_doc/CountryReports/WFD/SABER_WFD_Malaysia_CR_Final_2013.pdf.
- Coates, J., & W. A. Draves. (2006). *Smart boys, bad grades*. Learning Resources Network (LERN).
- Commonwealth of Australia. (2002). *Boys: Getting it right*. Canberra: Australia, Parliament, House of Representatives, Standing Committee on Education and Training. Retrieved from: <http://hdl.voced.edu.au/10707/112304>

- Darling-Hammond, L. (2002). *Redesigning high schools: What matters and what works*. Stanford: School Redesign Network, Stanford University.
- Di Giacomo, T., Fishbein, B.G., & Buckley, V.W. (2013). International comparative assessments: Broadening the interpretability, application and relevance to the United States. *Research in Review 2012-5*, College Board, New York.
- Department of Statistics Malaysia. (2013). *Education and social characteristics of the population*. Putrajaya: Department of Statistics Malaysia.
- Economic Planning Unit (EPU), Prime Minister's Department, Malaysia and United Nations Country Team. (2011). *Malaysia: The Millennium Development Goals at 2010*. Kuala Lumpur: United Nations Country Team, Malaysia.
- Economic Planning Unit, Prime Minister's Department, Malaysia. (n.d.) Transforming technical and vocational education and training to meet industry demand. Strategy Paper 9, Economic Planning Unit, Putrajaya. Retrieved from <http://rmk11.epu.gov.my/pdf/strategy-paper/Strategy%20Paper%2009.pdf>.
- Geo.L., & Stickler, L.M. (2008). Teaching quality and student achievement: Making the most of recent research. TQ Research and Policy. Retrieved from <http://files.eric.ed.gov/fulltext/ED520769.pdf>.
- Goh, K. L., & Rohana, J. (2009). Earnings and rates of return to education. In S. B. Chew, S. Nagaraj, Lee, K.H. & H.A. Rahimah, (Eds.), *Education and work: The world of work* (pp. 167-207). Kuala Lumpur: Faculty of Economics and Administration, University of Malaya.
- Grønmo, L. S., & Olsen, R.V. (2006). TIMSS versus PISA: The case of pure and applied mathematics. In The second international association for the evaluation of educational achievement (IEA) international research conference: Proceedings of the IRC-2006, Volume 1: Trends in International Mathematics and Science Study (TIMSS). Amsterdam: IEA Secretariat.
- Hanushek, E. A., & Woessman, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature*, 46(3), 607-668.
- Hanushek, E. A., & Woessman, L. (2012). Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation. *Journal of Economic Growth*, 17, 267-321.
- Ishak, Z. & Low, S.F. (2013). Truancy among Malaysian students: An analysis based on ethnicity. *Journal of Teaching and Education*, 2(2), 331-338.
- Jacob, B. A. (2002). Where the boys aren't: Non-cognitive skills, returns to school and the gender gap in higher education. *Economics of Education Review*, 21(6), 589-598.
- Kafer, K. (2007). Taking the boy crisis in education seriously: How school choice can boost achievement among boys and girls. Position paper No. 604, Independent Women's Forum, Washington, D. C.
- Khalid, N. A. (2015). Student's perception toward technical and vocational education (TEVT) in Kedah, Malaysia. *European Journal of Social Science Review*, 1(3), 41-47.
- Kleinfeld, J. (1998). *The myth that schools shortchange girls: Social science in the service of deception*. Washington, D.C.: Women's Freedom Network.
- Lee, M. F. (1984). Peninsular Malaysia. In *The Drop-out problem in primary education, some case studies*, Bangkok: UNESCO Regional Office for Education in Asia and the Pacific. Retrieved from <http://unesdoc.unesco.org/images/0006/000623/062375eo.pdf>.
- Lee, K.H., & Nagaraj, S. (2006). Human resource development. In N.P. Tey & Y.L. Wong (Eds.), *Our people, our future* (pp. 29-74). Kuala Lumpur: Population Studies Unit, Faculty of Economics and Administration, University of Malaya and UM Press.
- Lee, K.H., & Nagaraj, S. (2011). The crisis in education. In H. Hill, S. Y. Tham & M.Z. Ragayah (Eds.), *Malaysia's Development Challenges*. London: Routledge.
- Malaysia. (2001). *The third outline perspective plan, 2001-2010*. Kuala Lumpur: Percetakan Nasional Malaysia Berhad.

- (2010). *Tenth Malaysia plan, 2011-2015*. Putrajaya: Percetakan Nasional Malaysia Berhad.
- (2015). *Eleventh Malaysia plan, 2016-2020: Anchoring growth on people*. Putrajaya: Economic Planning Unit, Prime Minister's Department.
- McCormick, M. P., O'Connor, E. E. Cappella, E., & McClowry, S.G. (2013). Teacher-child relationships and academic achievement, A multilevel propensity score model approach. *Journal of School Psychology, 51*(5), 611-624.
- McDougall, D., Saunders, W. M., & Goldenburg, C. (2007). Inside the black box of school reform: Explaining the how and why of change at getting results schools. *International Journal of Disability, Development and Education, 54*(1), 51-89.
- Ministry of Education, Malaysia. (1973). *Kajian keciciran [Dropout study]*. Kuala Lumpur: Ministry of Education, Malaysia.
- (2003). *Education development plan, 2001 – 2010*. Kuala Lumpur: Ministry of Education, Malaysia.
- (2013a). *Malaysia educational blueprint: Annual report 2013*. Putrajaya: Ministry of Education, Malaysia.
- (2013b). *Malaysia education blueprint 2013-2025 (Preschool to post-secondary education)*. Putrajaya: Ministry of Education, Malaysia.
- Ministry of Women and Family Development, Malaysia. (2003). *The progress of Malaysian women since independence 1957-2000*. Kuala Lumpur: Ministry of Women and Family Development, Malaysia.
- Mortenson, T. G. (1999). Where are the boys? The growing gender gap in higher education. *The College Board Review, 188*, 8-77.
- (2001). Where the guys are not: the growing gender imbalance in college degrees awarded. *Post Secondary Education Opportunity*, No. 104.
- Nagaraj, J. G. (2006). A national agenda for CHIP: Looking ahead, findings from the young people's workshop. Presented at the International Conference on Reaching and Nurturing Children with High Potential (CHIP) in Malaysia, 16th -17th August, Kuala Lumpur, Malaysia.
- Nagaraj, S., Goh, K.L., Tey, N.P., & Lee, K.H. (2008). Human capital deepening: The impact of gender on education and work of young persons. In L. Fredericks & S. Nair, (Eds.), *Poverty and distribution amidst diversity: Options and challenges for development*. Centre for Poverty and Development Studies, University of Malaya.
- Nagaraj, S., Lee, K.H., Chew, S.B., & Ahmad, R. A. (2009). Summary and conclusions. In, S. Nagaraj, K.H. Lee, S.B. Chew, & R.A. Ahmad, (Eds.), *The world of work* (pp. 253-79). Kuala Lumpur: Faculty of Economics and Administration, University of Malaya.
- Nagaraj, S., Goh, K.L., Cheong, K.C., Tey, N.P., & Jani, R. (2014). Gender imbalance in educational attainment and labour market dynamics: Evidence from Malaysia. *Malaysian Journal of Economic Studies, 51* (Special Issue), 127-145.
- Nanjunda, D.C., & Annapurna, M. (2006). Small hands in silicon city - Bangalore: Some facts and experiences at grass roots level. *Journal of Social Science, 13*(2), 151-156.
- National Economic Advisory Council (NEAC). (2010). *A new economic model for Malaysia – Part 1*. Kuala Lumpur: Government of Malaysia.
- Newmann, F.M., & Associates. (1996). *Authentic achievement: Restructuring schools for intellectual quality*. San Francisco: Jossey-Bass.
- Newmann, F. M., King, M.B., & Carmichael, D.L. (2007). *Authentic instruction and assessment: Common standards for rigor and relevance in teaching academic subjects*. Report prepared for the Department of Education, State of Iowa, Des Moines, IA.
- Nor, S.M., Roslan, S., Mohamed, A., Hassan, K.H.A., Ali, M.A.M., & Manaf, J.A. (2011). Dropout prevention initiatives for Malaysian indigenous *Orang Asli* children. *The International Journal on School Disaffection, 8*(1), 42-56.

- OECD. (2013). *Economic outlook for Southeast Asia, China and India: Beyond the middle-income trap*. Paris: OECD Publishing.
- Patel, T. (2014). Dropping out of school in Malaysia: What we know and what needs to be done. *Policy Ideas 14*, Institute for Democracy and Economic Affairs, Kuala Lumpur.
- Rahimah, A. A., & Suriati, S. (2013). Working children and knowledge of right to education: A study of child labour in Sabah, Malaysia. *Asian Social Science, 9*(8), 23-33.
- Riordan, C. (2003). Failing in school? yes; victims of war? No. *Sociology of Education 76*(4), 369-372.
- Rusdi, A.R., Zuraini M.H.R.N., Muhammad, M.A.Z., & Mohamad, H.H. (2008). A fifty year challenge in managing drug addiction in Malaysia. *Journal of Health and Translational Medicine 11*(1): 3-6.
- Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B. Dutton, J., & Kleiner, A. (2000). *Schools that learn: A fifth discipline fieldbook for educators, parents, and everyone who cares about education*. New York: Doubleday.
- Shannon, G. S., & P. Bylsma. (2005). Promising programs and practices for dropout prevention. Report to the legislature. Olympia, WA: Office of Superintendent of Public Instruction.
- Tey, N. P. (2006). Gender differentials in educational attainment. In, S. Nagaraj, K.L. Goh & N.P. Tey (Eds.), *Statistics in action*. Kuala Lumpur: University of Malaya Press.
- United Nations Development Programme. (UNDP). (2005). *Malaysia: Achieving the Millennium Development Goals*. Kuala Lumpur: United Nations Development Program.
- UNESCO. (2010). *Reaching the unreached in education in Asia-Pacific*. Bangkok: UNESCO, Bangkok.
- UNESCO Institute of Statistics. (2009). *Education indicators: Technical guidelines*. Retrieved from <http://www.uis.unesco.org/Library/Documents/eiguide09-en.pdf>.
- UNICEF. (2013). *Education for sustainable development: Promoting technical education and vocational training (TEVT)*. Best Business Practice Circular 4/2013. Kuala Lumpur: UNICEF and Companies Commission of Malaysia.
- von Drehle, D. (2007). The myth about boys. *Time*, July 26.
- Woldehanna, T., Jones, N., & Tefera, B. (2006). Children's educational completion rates and dropouts in the context of Ethiopia's national poverty reduction strategy. Paper presented at the International Association of Agricultural Economists Conference, Gold Coast, Australia.
- Yusuf, S., & Nabeshima, K. (2009). *Tiger economies under threat: A comparative analysis of malaysia's industrial prospects and policy options*. Washington D.C.: World Bank.
- World Economic Forum. (2014). *The global gender gap report*. Retrieved from http://www3.weforum.org/docs/GGGR14/GGGR_CompleteReport_2014.pdf
- Zaini, A.M.Z., Loh, W.Y., Nagaraj, S., Daniel, E.G.S., & Marohaini, Y. (2004). Explaining academic achievement: the role of academic ability. *FEA Working Paper Series 2004-8*, Kuala Lumpur: Faculty of Economics & Administration, University of Malaya. Retrieved from <http://cmsd.um.edu.my/images/fep/doc/2004%20Pdf/FEA-WP-2004-008.pdf>