TECHNICAL EFFICIENCY AND TOTAL FACTOR PRODUCTIVITY GROWTH OF THE BROILER INDUSTRY IN PENINSULAR MALAYSIA: A STOCHASTIC FRONTIER ANALYSIS

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DEDICATION

... to my wife, Tuan Nab and children Anwar, and Nor Anisah, for their love, faith, patience, encouragement and understanding. I thank them more than words can utter.

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In Malaysia feed ingredients for the broiler industry are mostly imported. However, owing to the shortage of supply, sometimes exporting countries could not meet the demand for feed ingredients especially maize and soybean meal. This was due to higher demand from China and India for these feed grains to be utilized for the production of 'Bio-fuel'. The competition for feed grains would increase the price of feed ingredients. The increase in price of feed grains was reflected in increased price of broiler feed and thus the cost of production would be higher. Hence, there

is an urgent need for total factor productivity improvement. If there is an improvement in total factor productivity, production cost for broiler would decline and the industry would become more competitive. The objective of the thesis is therefore to measure the total factor productivity growth contributed to the output of the Malaysian broiler industry. The discussion and analysis would involve Peninsular Malaysia and the selected states. For this study, total factor productivity growth is decomposed into technical efficiency, technical progress and scale component. An econometric technique of the stochastic frontier production function approach was applied whereby technical efficiency, technical progress and scale effect was measured together with a systemic inefficiency term in the inefficiency model. The translog and Cobb-Douglas functional forms were identified and applied for the estimation of the broiler industry using time series data covering the year 1998 to 2006 both at national and 2001 to 2006 for state levels. The results show that during the early period technical progress was rather slow, but subsequently improved during the second part of the study. However, compare to scale component, technical efficiency had slightly improved during the period. During the period of study the broiler industry was experiencing decreasing return to scale suggesting that its production was in stage II of the production function. Estimation result also reveals that capital (in this case breeding stock) is important for the broiler industry at state levels and efficiency improvements took place among the states (catching up). The estimation of technical efficiency shows that the state of Johor is the most efficient producer, while the state of Selangor is the least efficient producer.

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KECEKAPAN TEKNIK DAN PERTUMBUHAN FAKTOR PRODUKTIVITI KESELURUHAN INDUSTRI AYAM DAGING DI PENINSULA MALAYSIA: ANALISA PENGELUARAN PERBATASAN STOCHASTIK

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Kebanyakan input terutamanya bahan makanan untuk industri ayam daging di Malaysia adalah diimpot. Kadangkala negara pengekspot tidak dapat memenuhi permintaan bekalan bahan makanan ayam daging seperti jagong dan kacang soya. Tambahan pula terdapat permintaan daripada negara China dan India bagi bahan tersebut untuk pengeluaran bahan 'bio-fuel'. Saingan boleh menyebabkan kekurangan bekalan bahan input dan menyebabkan kenaikan harga input tersebut di-pasaran. Dalam hubungan ini, kenaikan harga bahan makanan ayam daging yang diimpot menyebabkan kenaikan harga makanan ayam daging yang akhirnya menigkatkan kos makanan ayam daging. Faktor tersebut telah menyumbangkan kapada kenaikan kos pengeluaran ayam daging dan perusahaan di-dalam industri penternakan ayam daging kurang berdaya saing. Oleh itu usaha untuk meningkatkan sumbangan pertumbuhan produktiviti faktor keseluruhan (Total

factor productivity growth or TFPG) perlu dipertingkatkan. Sekiranya sumbangan TFPG dapat dipertingkatkan, penjimatan kos pengeluaran akan berlaku dan industri ayam daging menjadi lebih berdaya saing. Tesis ini bertujuan megukur sejauh mana pertumbuhan produktiviti faktor keseluruhan menyumbang kapada output industri ayam daging. Dalam hal ini, berbincangan dibahagi kapada dua bahagian. Berbincangan peringkat pertama merangkumi industri ayam daging di Semenanjung Malaysia, manakala peringkat kedua perbincangan memberi fokus diperingkat negeri-negeri yang dipilih. Dalam kajian ini pertumbuhan produktiviti faktor keseluruhan (TFPG) dibahagikan kapada tiga bahagian iaitu kecekapan teknik, kemajuan teknologi dan kesan skala. Kajian ini dijalankan menggunakan pendekatan fungsi pengeluaran perbatasan stokastik dengan menggunakan data siri masa mencakupi tahun1998 hingga 2006 pada peringkat Semenanjung Malaysia dan 2001hingga 2006 bagi peringkat negeri. Dalam kajian ini fungsi pengeluaran translog model dan fungsi pengeluaran Cobb-Douglas telah dikenal pasti sesuai untuk penganggaran bagi kajian ini. Keputusan kajian menunjukkan di awal kajian, kemajuan teknoloji adalah perlahan tetapi bertambah baik diperingkat kedua kajian. Kajian ini mendapati kesan skala dan kecekapan teknik menurun terutama diperingkat kedua kajian. Bagi peringkat negeri pula, ujian Cobb-Douglas menunjukkan pulangan ikut skala bidalan berkurang. Kajian juga mendapati kapital (Ayam baka) adalah penting untuk meningkatkan lagi pengeluaran ayam daging di Peninsula Malaysia. Anggaran kecekapan teknik didapati negeri Johor paling tinggi manakala negeri Selangor paling rendah.