

Fuel Expenditure

Impact on households

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Preface

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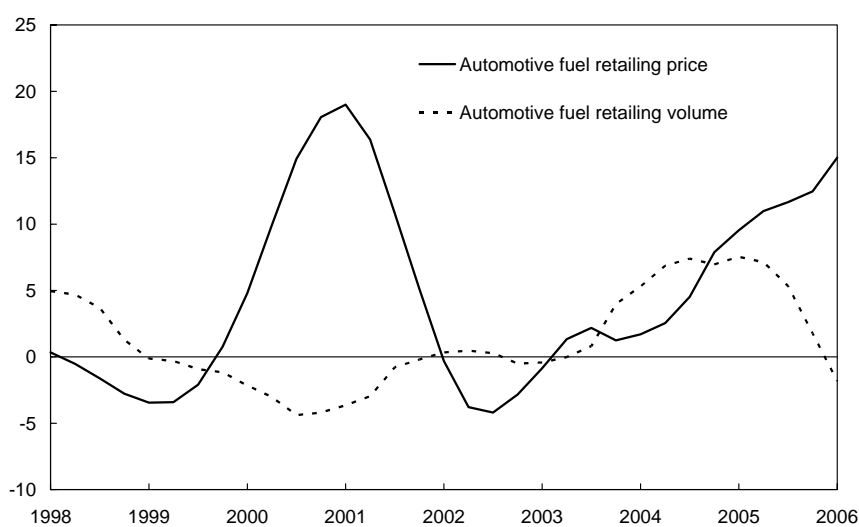
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1. Introduction

Fuel price rises have been prominent in newspapers recently. Over the past year the price of retail fuel has increased and the growth in consumption has slowed. The June 2006 retail trade survey reported a hefty 15 percent price increase. There was a decrease of 1.8 percent in volume of automotive fuel sold in the year ended June 2006 compared to June 2005. Retail fuel prices have risen further in July and August, but the household retail spending data are not yet available.

Figure 1 Automotive fuel retailing

Annual percent change



Source: Statistics New Zealand

Retail prices for petrol and diesel from the Ministry of Economic Development show that in the year to August 2006, prices of diesel and petrol have risen 33 percent and 25 percent respectively.

Figure 2 Diesel price trends

Retail price of diesel, cents per litre, weekly (to 18 August 2006)

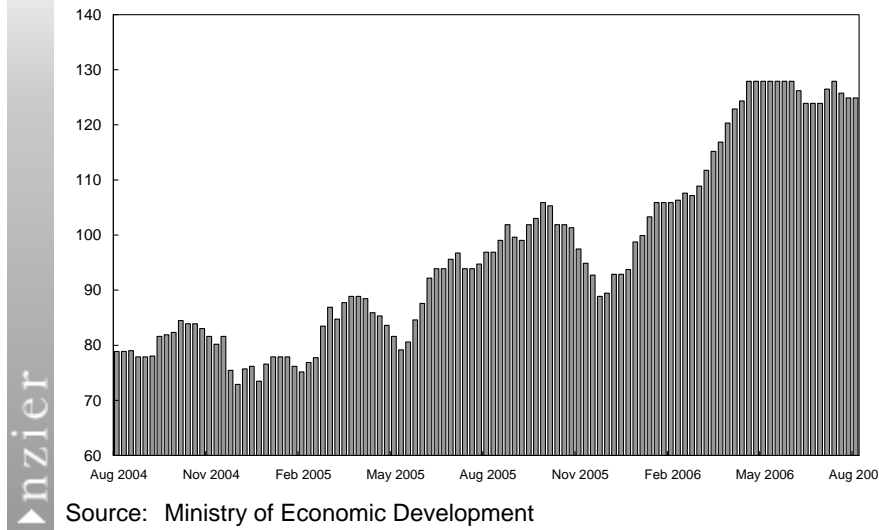
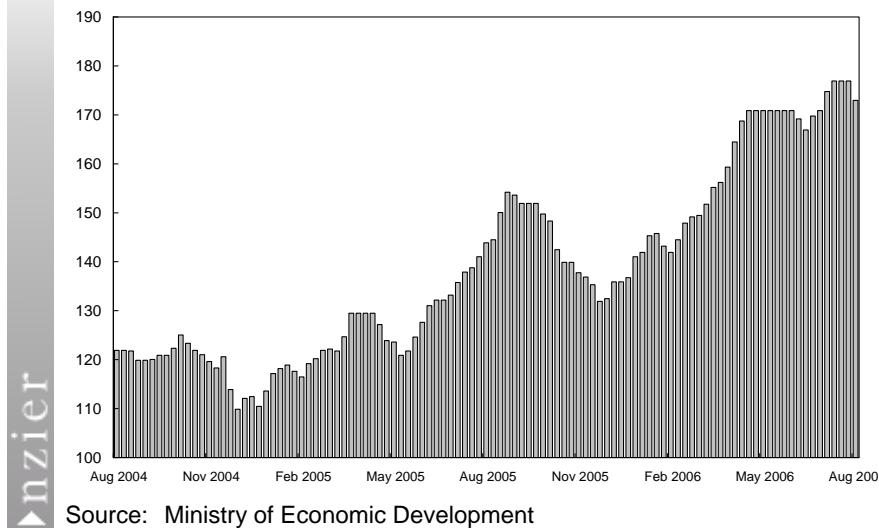


Figure 3 Petrol price trends

Retail price of 91 octane petrol, cents per litre, weekly (to 18 August 2006)



In this paper we present estimates of the impact of rising fuel prices on expenditure for New Zealand households by income group for 2007.

2. Reasons behind oil price rises

The main reasons for the rise in local fuel prices are clear: the international price of crude oil has increased sharply due to strong demand in the face of supply constraints, some of which have been political; and the New Zealand exchange rate weakened sharply. The international price for crude oil has reached US\$74 dollars a barrel in August 2006. The New Zealand dollar has depreciated to US\$0.63 in August 2006 compared with US\$0.70 in August 2005. Excise duty has also played a role in the price rise. In April 2005, an

increase in the fuel excise on motor spirits added \$0.05 per litre to the price of regular petrol. In April 2006, there was an additional increase of \$0.0007 per litre. In New Zealand, excise duty and GST represent nearly 40 percent of the retail fuel price.

3. Impact of the rise in fuel prices

Rising fuel prices impact consumers directly by rising fuel bills and indirectly through rising prices of other goods and services. We only consider the direct impacts on the fuel expenditure in this paper. Increased fuel expenditure will potentially reduce household disposable income substantially. Issues such as household substitution of goods and services due to reduced disposable income are not explored in this paper.

Statistics New Zealand's household economic survey is held every three years. The latest survey was conducted in 2004. In this paper we explore possible household fuel expenditure in 2007. We estimate differences in regional purchasing capacity. We present estimates of average annual household fuel expenditure for New Zealand, Auckland, Waikato, Wellington, Canterbury, Otago and Southland regions.

We model the effect of the recent rise in fuel prices in addition to the ongoing trend of increasing household consumption of fuel. The futures prices for oil and NZIER's current exchange rate forecasts have been used to estimate 2007 fuel prices. For the purpose of our estimates we have used trends in the household fuel expenditure patterns between 2001 and 2004 to estimate fuel volume demand for 2007. Consumers will tend to respond to a rise in prices by reducing the quantity purchased. Taking this into consideration, we have assumed a fairly low short-term demand elasticity across all income groups of -0.25^1 i.e. a 1 percent increase in price will result in a 0.25 percent reduction in fuel volume demand.

3.1 Impact on New Zealand

We estimate that average fuel expenditure per household in 2007 for all income groups will be 42 percent more than the amount spent in 2004. The annual average expenditure for all income groups will be \$2,289 in 2007 compared with \$1,612 in 2004. Households in the income group of \$87,600 and over will face a 68 percent increase in fuel expenditure which means an additional spend of \$1,837 to their household budget. Households earning under \$23,000 will have to increase fuel expenditure by 25 percent. The average households earning between \$37,900 and \$58,899 spent \$1,535 per

¹ New Zealand's Energy Outlook To 2030, August 2006, Ministry of Economic Development, http://www.med.govt.nz/templates/MultipageDocumentTOC_21862.aspx accessed on 30/8/06

year on fuel in 2004. These householders will face a 25 percent increase in fuel expenditure which means an additional \$379 to their household budget.

Table 1 Average per household annual fuel expenditure: New Zealand

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001	\$730	\$1,286	\$1,641	\$1,949	\$2,270	\$1,496
2004	\$685	\$1,150	\$1,535	\$1,994	\$2,698	\$1,612
2007	\$857	\$1,352	\$1,913	\$2,787	\$4,534	\$2,289

Source: Statistics New Zealand, NZIER

Table 2 Percent changes in average per household annual fuel expenditure

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001-2004	-6%	-11%	-6%	2%	19%	8%
2004-2007	25%	18%	25%	40%	68%	42%

Source: Statistics New Zealand, NZIER

3.2 Impacts by region

Auckland has a high rate of car ownership. There is almost one car for every two people in the Auckland region and nearly 64 percent of Auckland employees travel to work by car². Therefore, rises in the price of fuel will have limited response in the Auckland region in the short-term. Our estimates suggest a 31 percent rise in fuel expenditure across all income groups. The response to the price rise will be slow as it takes time for people to adjust to high fuel prices. In the long-term households will adjust their consumption by changing travel patterns and switching to more fuel-efficient vehicles. In 2007, households in the under \$23,000 income group will be spending an additional \$400, whereas those in the income group \$37,900 to \$58,899 will be spending an additional \$232 and households earning over \$87,600 will be spending an extra \$2,116.

² <http://www.arc.govt.nz/arc/auckland-region/>

Table 3 Average per household annual fuel expenditure: Auckland region

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001	\$827	\$1,193	\$1,674	\$2,002	\$2,416	\$1,689
2004	\$875	\$1,203	\$1,478	\$1,906	\$2,930	\$1,848
2007	\$1,276	\$1,652	\$1,710	\$2,431	\$5,046	\$2,423

Source: Statistics New Zealand, NZIER

Table 4 Percent changes in average per household annual fuel expenditure

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001-2004	6%	1%	-12%	-5%	21%	9%
2004-2007	46%	37%	16%	28%	72%	31%

Source: Statistics New Zealand, NZIER

Waikato region's average annual household fuel expenditure was above the national average in 2004. This highlights the region's greater reliance on private transport. In 2007, 40 percent to 122 percent increases in fuel expenditure across the various income groups are expected. On average, households will have to spend an additional \$1,731 in annual fuel expenditure. In 2007, households in the under \$23,000 income group will be spending an additional \$448, whereas those in the income group \$37,900 to \$58,899 will be spending an additional \$1,069 and households earning over \$87,600 will be spending an extra \$3,419.

Table 5 Average per household annual fuel expenditure: Waikato region

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001	\$621	\$1,471	\$1,547	\$1,911	\$1,855	\$1,400
2004	\$718	\$1,500	\$1,769	\$2,791	\$2,793	\$1,928
2007	\$1,165	\$2,089	\$2,838	\$5,991	\$6,212	\$3,659

Source: Statistics New Zealand, NZIER

Table 6 Percent changes in average per household annual fuel expenditure

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001-2004	16%	2%	14%	46%	51%	38%
2004-2007	62%	39%	60%	115%	122%	90%

Source: Statistics New Zealand, NZIER

Wellington region's usage of public transport is high. In 2004, Wellington's annual average household fuel expenditure was below the national average. This could be due to Wellington region's compact layout as well as its good public transport system. The rise in fuel prices will increase prices in the public transport system and reduce household discretionary income. However, our estimates only consider fuel expenditure for private motor vehicles. In 2004, fuel expenditure for all income groups declined by \$53 per household. But in 2007, fuel expenditure for the average household is expected to rise by 17 percent to \$1,671. The average household earning between \$37,900 and \$58,899 spent \$1,274 in 2004. These households will reduce their fuel expenditure by 4 percent. Households earning above \$87,600 will face additional expenditure of \$1,288. Households earning under \$23,000 will reduce their fuel expenditure by 48%.

Table 7 Average per household annual fuel expenditure: Wellington region

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001	\$545	\$1,560	\$1,659	\$1,643	\$1,987	\$1,484
2004	\$279	\$1,331	\$1,274	\$1,561	\$2,239	\$1,432
2007	\$145	\$1,473	\$1,223	\$1,986	\$3,528	\$1,671

Source: Statistics New Zealand, NZIER

Table 8 Percent changes in average per household annual fuel expenditure

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001-2004	-49%	-15%	-23%	-5%	13%	-4%
2004-2007	-48%	11%	-4%	27%	58%	17%

Source: Statistics New Zealand, NZIER

In the Canterbury region, household fuel expenditure in 2004 for the income group \$23,000 and under was unchanged from 2001. Fuel expenditure by households earning between \$23,000 and \$58,899 declined. In 2007, households in the under \$23,000 income group will be spending an additional \$233, the income group between \$37,900 to \$58,899 will be spending an additional \$215. The income group over \$87,600 will be spending an extra \$1,526.

Table 9 Average per household annual fuel expenditure: Canterbury region

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001	\$650	\$1,329	\$1,970	\$1,985	\$2,165	\$1,488
2004	\$650	\$1,133	\$1,704	\$2,017	\$2,487	\$1,570
2007	\$882	\$1,252	\$1,919	\$2,796	\$4,013	\$2,172

Source: Statistics New Zealand, NZIER

Table 10 Percent changes in average per household annual fuel expenditure

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001-2004	0%	-15%	-14%	2%	15%	6%
2004-2007	36%	11%	13%	39%	61%	38%

Source: NZIER

Otago and Southland region's annual household fuel expenditure will be 21 percent higher for all income groups in 2007. In 2004, fuel expenditure for all income groups declined by 7 percent from 2001. For all income groups, fuel expenditure will be an additional \$285 in 2007. In 2007, households in the under \$23,000 income group will be spending additional \$326 which is a 52 percent rise from 2004. Expenditure for the income groups between \$37,900 to \$58,899 will be an additional \$194 and whereas the income group over \$87,600 will decrease their spending by \$184.

Table 11 Average per household annual fuel expenditure: Otago and Southland region

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001	\$571	\$1,284	\$1,553	\$1,981	\$2,640	\$1,423
2004	\$625	\$1,197	\$1,358	\$1,845	\$1,943	\$1,323
2007	\$951	\$1,488	\$1,552	\$2,287	\$1,759	\$1,608

Source: Statistics New Zealand, NZIER

Table 12 Percent changes in average per household annual fuel expenditure

By income group of households, March year

	Under \$23,000	\$23,000 to \$37,899	\$37,900 to \$58,899	\$58,900 to \$87,599	\$87,600 and Over	All income groups
2001-2004	10%	-7%	-13%	-7%	-26%	-7%
2004-2007	52%	24%	14%	24%	-9%	21%

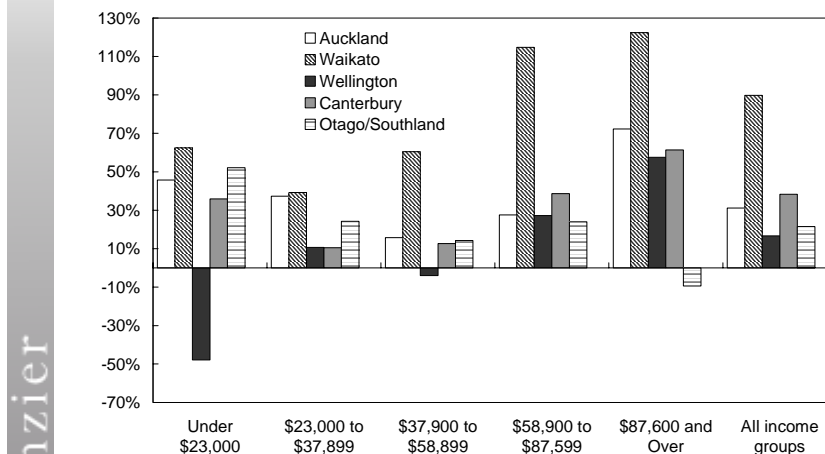
Source: Statistics New Zealand, NZIER

3.3 Comparison across regions

Most households across all the regions considered in this paper face a substantial increase in fuel expenditure in 2007. Figure 4 shows percent increases or decreases in fuel expenditure across regions by household income groups. Our estimates show that Wellington households in the income group \$23,000 and under reduce fuel expenditure whereas the households in other regions will increase their fuel expenditure. In the \$37,900 to \$58,899 income group, Waikato will face the highest increase in fuel expenditure whereas Wellington households will reduce fuel expenditure. Households in Auckland, Waikato, Wellington and Canterbury regions in the income group \$87,600 and over will still increase their fuel expenditure whereas Otago/Southland will decrease their fuel expenditure.

Figure 4 Expenditure on fuel by income group and region

Percent change, 2004-2007



Source: Statistics New Zealand, NZIER

4. Conclusion

In conclusion, our estimates highlight that the expected increases from 2004 to 2007 are much higher than the increases from 2001 to 2004. Fuel expenditure for the average New Zealand household is expected to rise by 42 percent compared to the 8 percent increase in 2004. Fuel expenditure increases vary across regions. This could be due to availability of public transport, dependence on private transport due to location and infrastructure such as roading.

Actual impact on fuel expenditure would differ if the price of fuel is vastly different from our assumptions and if consumers cut back consumption by more or less than our assumptions.