

三隧分流「堅」定「流」？
TO WHAT EXTENT IS THE TOLL
ADJUSTMENT PROPOSAL
EFFECTIVE?

CHEUNG TSZ CHUNG
1155109334
KWONG CHUN HEI
1155109970
CHAN CHUN YU
1155110614

INTRODUCTION:

- HK Government has released the Toll Adjustment Proposal on 1/22/2019, as to solve the congestion problem of the cross harbour tunnels by adjusting the toll.
- This proposal has been widely discussed in the society, but the effectiveness of it still lies unknown. Here, we are aiming at estimating the effect of the adjustment proposal in an Economics perspective.

METHODOLOGY:

$Flow(p) = \alpha_0 + \alpha_1(price\ ratio\ p) + \alpha_2ln(GDP) + \alpha_3timetrend + u$
 $Flow(t) = \beta_0 + \beta_1(price\ ratio\ t) + \beta_2ln(GDP) + \beta_3timetrend + v$

Private car and Taxi are denoted by p and t

Price ratio: Toll in WHC/ Toll in CHT

GDP: Real GDP per capita for the month

Time trend: Time trend denoted by 1 to 36

As for α_0 & β_1 , the effect of change in price ratio can be estimated.

$\Delta Flow(p) = \alpha_1\Delta(price\ ratio\ p) + \alpha_2\Delta ln(GDP) + \alpha_3\Delta timetrend$
 $\Delta Flow(t) = \beta_1\Delta(price\ ratio\ t) + \beta_2\Delta ln(GDP) + \beta_3\Delta timetrend$

REGRESSION AND ANALYSIS

Dependent variables: Total vehicle flow				
	WHC		CHT	
	Private	Taxi	Private	Taxi
Price ratio	-308041* (94936)	-61791* (28264)	34511 (71764)	-14636 (30750)
Real GDP per capita	545250* (185685)	200973* (96106)	96320 (112989)	-12080 (110696)
Time trend	4971* (1971)	1746 (1175)	-126 (1551)	-2155 (1312)

Significant*

price ratio reflect the relative toll of the WHC to the CHT, when it increase/decrease, it implies the cost of using the WHC increase/decrease, and the cost of using the CHT decrease/increase.

$\Delta Flow(p)$ and $\Delta Flow(t)$ for WHC are significant, but for CHT are not.

Q: Why the $\Delta Flow(p)$ for CHT seems insignificant?

A: It might because that the CHT is already too crowded. As the usage of CHT has reached its designed capacity already, the effect of change in price seems insignificant.

Q: Why the $\Delta Flow(t)$ for CHT is positive while the cost of using it decreased?

A: One possible answer is when people hire taxi, it implies that they are in a hurry. They are not very sensitive to price, but to the time spend on traveling. As the price ratio increase, the vehicle flow of WHC will decrease so as WHC will become less crowded, then taxis will switch from CHT to WHC to save time.



CONCLUSION:

- The increase in vehicle flow in WHC is more significant than the decrease in vehicle flow in CHT.
- The proposal seems to be ineffective as the congestion problem in CHT cannot be solved by the toll adjustment.

ASSUMPTION:

- Cross Harbour Tunnel (CHT) and West Harbour Crossing (WHC) are close substitute.
- East Harbour Crossing (EHC) is not a close substitute to the other two, due to its distinct geographical location.

ADJUSTMENT PLAN:

	CHT	WHC
Private Cars	\$20→\$40	\$70→\$50
Taxis(Hired)	\$10→\$20	\$65→\$36
Taxis(Empty)	\$10→\$15	\$65→\$15

