

論文要旨と審査結果報告

Essays on Optimal Transport Infrastructure Development

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I. 論文要旨

The paper investigates the optimal long-run transport infrastructure development policy under a constraint that the transport authority naively invests all the toll revenues. The study finds that unlike in the first best the second-best pricing policy must include an adjustment term to correct the distortion caused by such naïve behavior, and the welfare loss compared to the first best is around several percent.

II. 審査報告

The thesis is mainly consisted of theoretical work including simulation. The candidate's dissertation investigates the optimal policy concerning transport network development under different settings and conditions. Specifically it is consisted of three parts, namely (a) the optimal urban transport improvement in a general settings by considering land-use model, (b) the optimal design of a circumferential highway within a city model, and (c) welfare recovery when the highway investment is made according to "investment cost" policy and not according to "capital cost" policy (naïve policy with short run marginal cost pricing) with a view to achieve long-run self- financing.

There are several revision requests made by the examiners, and corresponding satisfactory revisions have been made by the candidate as follows.

Item No	Description	Remarks
1	Correct Figure 7, LRMC, SRMC Present Hamiltonian for FB and	Corrected Accordingly in Figure 7 in the slide and Figure 4.1 (Chapter 4) in Thesis. I have presented Hamiltonian for FB and SB in the
2	SB	slide.

	Definition of Naïve Policy should	
3	cover SB as well	Added in section 4-3-1 (chapter 4) Pg. 76. in Thesis.
	When P in SB is equal to P in FB?	
4	i.e., when $\mu=1/GI$?	Added in section 4-3-1 (chapter 4) Pg. 79.
	Robustness check is needed In	Robustness check is provided (See figure 4.2 of section 4.3.2) Pg. 83 in Thesis.
5	Simulation	Interest rate. Lower interest rate recovers welfare significantly. However, at higher interest rate welfare recovery is less. When interest rate is zero, there is no welfare loss. When interest rate=2%, Welfare Index for Naive Policy is 1.0767 and for SB is 1.0642. When interest rate=10%, Welfare Index for Naive Policy is 1.1666 and for SB is 1.1343. Thus, at 2% (lower) interest rate, SB Policy recover welfare 2.58% more than that at(10%) higher interest rate. Other parameters like demand elasticity does not show significant effect in reducing welfare. Pg. 87 in Thesis.
	Check which parameter is crucial	
5(1)	to reduce the welfare significantly	We change the value of r. Now $r=5\%$. Also the welfare index is checked with various r. (Figure 4.7). For higher r, difference between FB and SB and SB and Naïve Policy found bigger. Pg. 87 in Thesis.
	Interest rate of 0.025 is too low.	
	See if r higher, difference between	
	FB and SB or SB and Naïve	
5(2)	Policy becomes bigger or not.	We compare welfare in FB, SB and Naive policy. To compare welfare between different policies, we used a welfare index defined in Equation (4.41) (Pg. 82 in Thesis) and followed by De Palma et al. (2012). The welfare index for naïve policy relative to FB is 1.1427 (114.27%). Pg. 85 in Thesis.
	Compare welfare in FB, SB and	
6	Naïve Policy.	The welfare index for SB relative to FB is 1.0838 (108.38%). The welfare recovery = $1.1427 - 1.0838 = 0.0589$ (5.89% of the FB Welfare). Pg. 85 in Thesis.
	Welfare loss of Naïve Policy	
6(1)	relative to FB	
	Welfare recovery of SB from	
6(2)	Naïve Policy i	
	Dissertation Abstract as well	
7	introduction must be polished	I revised the Abstract and Introduction. Pg. i and Pg. 1 in Thesis.

Though the writing in some parts are still rough hewn, the findings and results contain some net contribution to the existing literature. It is expected that a few papers will be generated as publishable-quality with a minor revision to the work already completed.

Examiners and advisers are

Takashi Fukushima

Tetsushi Sonobe

Keisuke Kawata (Hiroshima University)