Supplementary Material for Consumer Information and Pharmaceutical Prices: Theory and Evidence

David Granlund[1,2] and Niklas Rudholm[1,3]

[1]The Swedish Retail Institute (HUI),
SE-103 29 Stockholm, Sweden.
[2]Department of Economics, Umeå University,
SE-901 87 Umeå , Sweden
[3]Department of Economics, Dalarna University,
SE-781 88 Borlänge, Sweden.

HUI Working Paper No 8

Abstract

Here we present the results from the additional regressions discussed in footnotes in our article for the basic model with and without adjustment, along with some discussion regarding these results.

Identifying the brand name drug, footnote 10

As mentioned in our paper, there were 9 percent of the cases where the method used for identifying the brand name drug gave ambiguous results. Thus, all regressions have also been performed excluding these 9 percent of the cases. As can be seen in Table A1 below, the estimated reform effect for the basic models, with and without adjustment, are all slightly less negative compared to the full samples. However, the differences are small in size and not statistically significant at conventional levels.

Table A1.

		Brands		Generics	
		Basic	Basic+adj.	Basic	Basic+adj.
D		-18.28***	-53.96***	-10.68***	-135.61**
		(5.89)	(16.92)	(1.76)	(56.16)
$Trend$		-1.94***	-1.49***	-2.77***	-2.03***
		(0.50)	(0.47)	(0.81)	(0.67)
$D/(t-R)$	(γ)		35.77***		125.22**
			(13.21)		(55.08)
$D/(t-R)$	(μ)		354.00***		101.00***
			(see note)		(see note)
$\Delta \ln Price/\Delta D$		-18.28***	-40.38***	-10.68***	-41.07***
		(5.89)	(12.23)	(1.76)	(14.61)
Sample size		44570	44570	52551	52551
Log likelihood		72580	72588	71529	71539

The models with adjustment are here estimated conditioned on μ being 354 and 101, respectively. No standard errors for this parameter is therefore reported. Also, see notes to Table 2 in the paper.

Identifying the brand name drug, footnote 11

To test whether the method used in the paper for identifying the brand name drug works, a dataset from Rudholm (2001) was used. This test revealed that the method works well for tablets and capsules, while performing less well for other types of products (e.g. oral fluids, intravenous fluids, etc). As such, we have re-estimated the empirical model using a dataset including only tablets and capsules.

The results from these estimations for the basic models with and without adjustment are presented in Table A2. For the models without adjustment, the

reform-effect is somewhat larger for brands, and somewhat smaller in size for generics compared to the original samples. Turning to the models including the adjustment process, the results show that the reform effect is larger for both brands and generics as compared to the original samples. However, neither of the differences are statistically significant. As can be seen in Table A2, the other qualitative results presented in the paper also holds.

Table A2.Prices for tablets and capsules

		Brands		Generics	
		Basic	Basic+adj.	Basic	Basic+adj.
D		-21.01***	-71.96***	-10.56***	-157.44**
		(6.63)	(19.54)	(1.83)	(61.77)
$Trend$		-2.44***	-1.79***	-3.52***	-2.65***
		(0.52)	(0.51)	(0.82)	(0.66)
$D/(t-R)$	(γ)		51.07***		147.19**
			(15.66)		(60.54)
$D/(t-R)$	(μ)		354.00***		101.00***
			(see note)		(see note)
$\Delta \ln Price/\Delta D$		-21.01***	-52.59***	-10.56***	-46.31***
		(6.63)	(14.00)	(1.83)	(16.09)
Sample size		40168	40168	50792	50792
Log likelihood		64117	64131	67922	67938

See notes to Table A1.

The timing of the reform, footnote 18

Since pharmaceutical firms knew about the reform before it came into effect in October, 2002, it is also possible that they started to adjust to the reform before this date. If this was the case, we would expect to obtain larger estimates of the reform effect if the estimations were performed excluding observations from the months directly before the reform. To study the importance of this possibility, we estimated all models excluding observations originating from April 2002, when the law regarding the reform was passed by parliament, until October 2002, as well as from January 2002, when the bill was presented to parliament, until October 2002, respectively. As can be seen in Table A3 below, the reform effects are of the same magnitude for brands as in the original sample when excluding observations from the period April 2002 to October 2002. Turning to generics, the reform effect is larger in the basic model, while smaller in the model

including adjustment, than in our original sample. However, these differences are not statistically significant at conventional levels.

Table A3.Prices, excluding observations April 2002 to October 2002

		Brands		Generics	
		Basic	Basic+adj.	Basic	Basic+adj.
D		-20.89*	-57.80***	-20.35	-113.56**
		(11.59)	(21.23)	(16.44)	(45.38)
$Trend$		-2.04***	-1.54***	-2.71***	-2.08***
		(0.52)	(0.51)	(0.82)	(0.70)
$D/(t-R)$	(γ)		42.25***		115.87**
			(14.11)		(48.63)
$D/(t-R)$	(μ)		354.00***		101.00***
			(see note)		(see note)
$\Delta \ln Price/\Delta D$		-20.89*	-41.76**	-20.35	-26.08
		(11.59)	(16.60)	(16.44)	(16.82)
Sample size		42752	42752	52505	52505
Log likelihood		68759	68772	69752	69760

See notes to Table A1.

Table A4.Prices, excluding observations January 2002 to October 2002

		Brands		Generics	
		Basic	Basic+adj.	Basic	Basic+adj.
D		-25.42*	-65.41***	2.14	-116.65**
		(13.42)	(23.60)	(19.38)	(46.51)
$Trend$		-1.98***	-1.45***	-2.70***	-2.01***
		(0.52)	(0.52)	(0.83)	(0.72)
$D/(t-R)$	(γ)		44.09***		121.38**
			(14.45)		(48.62)
$D/(t-R)$	(μ)		354.00***		101.00***
			(see note)		(see note)
$\Delta \ln Price/\Delta D$		-25.42**	-48.67*	2.14	-25.02
		(13.42)	(18.89)	(19.38)	(19.54)
Sample size		40539	40539	49726	49726
Log likelihood		64404	64419	64801	64811

See notes to Table A1.

When excluding the period from January 2002 to October 2002, we observe that the reform effect is somewhat larger for brand name pharmaceuticals as compared to our original sample. This might be seen as an indication that some brand name producers started to adjust to the new reform prior to the official introduction. However, the standard errors also indicate that the differences in the estimated reform effects between this and the original sample are not statistically significant. Finally, for generics the reform effect is not statistically significant when excluding the period January 2002 to October 2002.

Estimation of the time trend, footnote 20

Negative trend estimates are expected for two reasons. First, the price index for pharmaceuticals in Sweden has declined during the period of study. Second, since the price index also is affected by entry of new, relative expensive pharmaceuticals, the price of existing pharmaceuticals have on average a more negative development than the price index. Still, one might suspect that part of the reform effect is captured by the time trend. If this was the case, we would expect the time trend to be less negative when estimating it using only pre reform data. We have estimated the time trend for four different time periods prior to the reform. Both for brands and generics, these estimates are slightly more negative compared to the estimated time trend for the full samples, but the differences are not statistically different from zero. Thus, this does not seem to be a problem in this paper.

Table A5. Estimates of the time trend, pre-reform data.

Sample	Coefficient	Std.error	Sample size	Log likelihood
Brands 21	-2.42***	0.79	15366	30280
Brands 18	-2.53***	0.90	13184	25176
Brands 15	-2.51**	1.06	10997	20414
Brands 12	-2.72**	1.16	8784	15787
Generics 21	-3.48***	1.07	19363	33830
Generics 18	-3.85***	1.19	16350	28229
Generics 15	-3.72***	1.21	13402	22072
Generics 12	-4.32***	1.34	10623	15477

Note: The periods refer to the first 21, 18, 15 and 12 months in our dataset.
Also, see notes to Table 2 in the paper.