



Are Small Dairy Producers Efficiently Integrated into Markets in Panamá?

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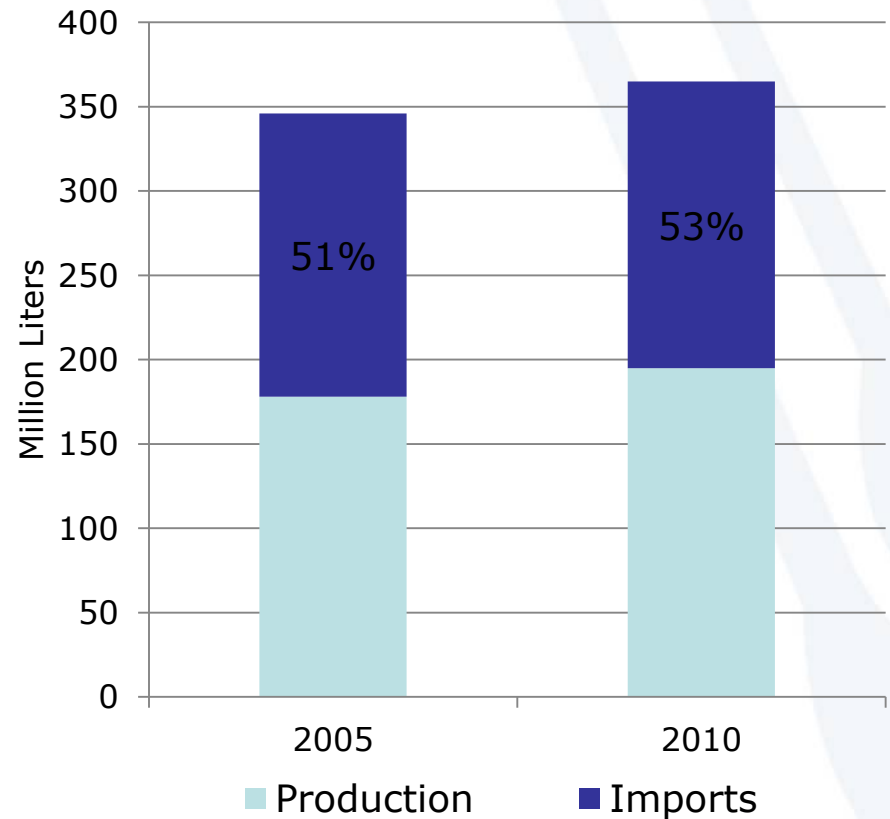


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I. Market Structure

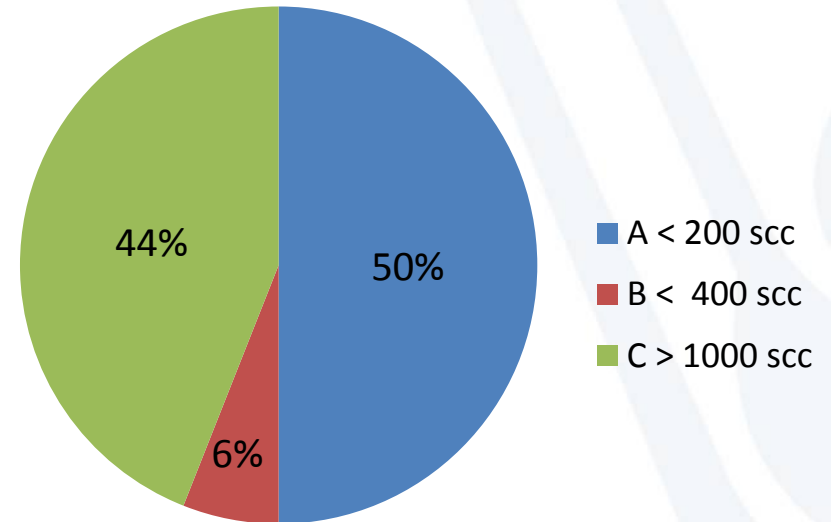
- Market size



Source: Guevara, 2011

I. Market Structure

- Market size
- Product quality



Source: Guevara, 2011

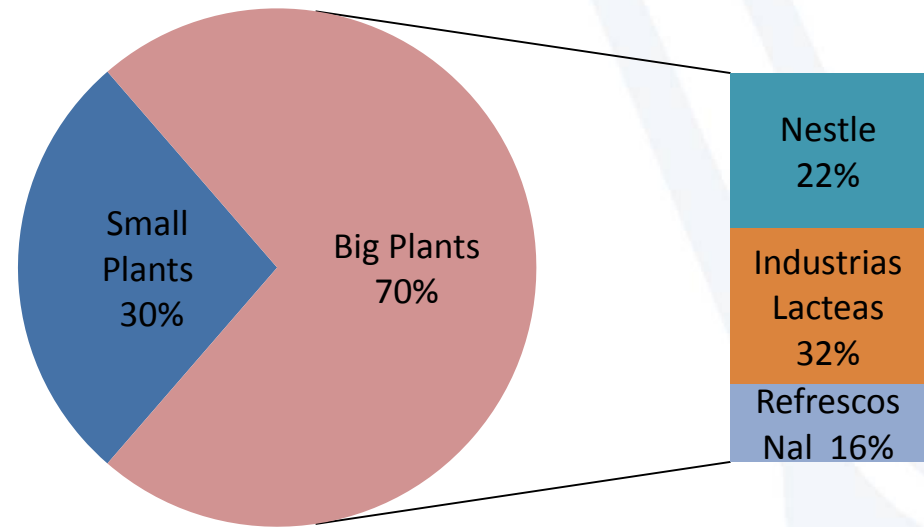
I. Market Structure

- Market size
- Product quality
- Type of producer



I. Market Structure

- Market size
- Product quality
- Type of producers
- Level of market concentration



Source: Guevara, 2011

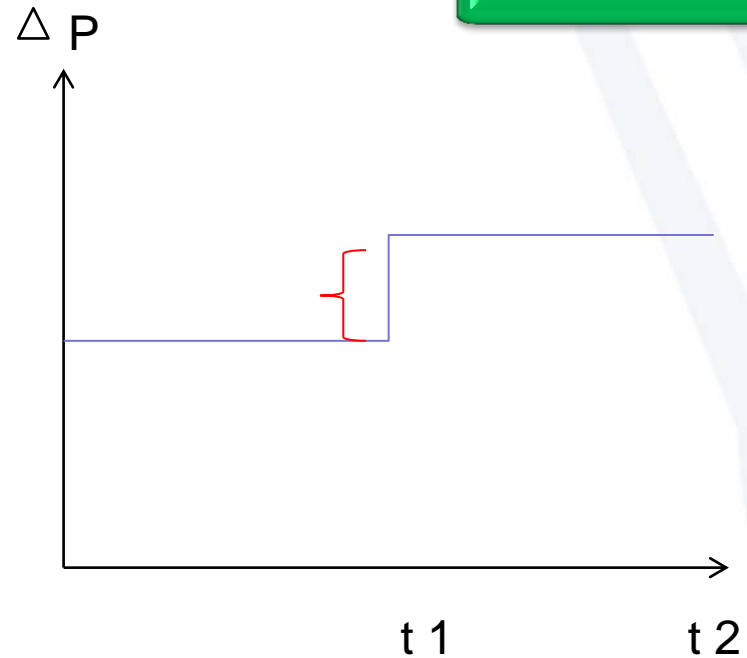
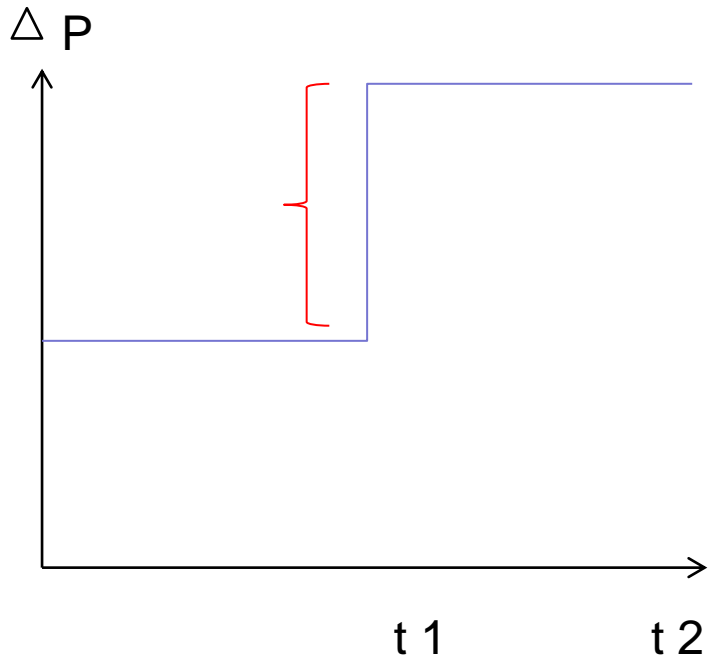
II. Vertical Price Transmission

Retailers

Wholesalers

Producers

- Magnitude



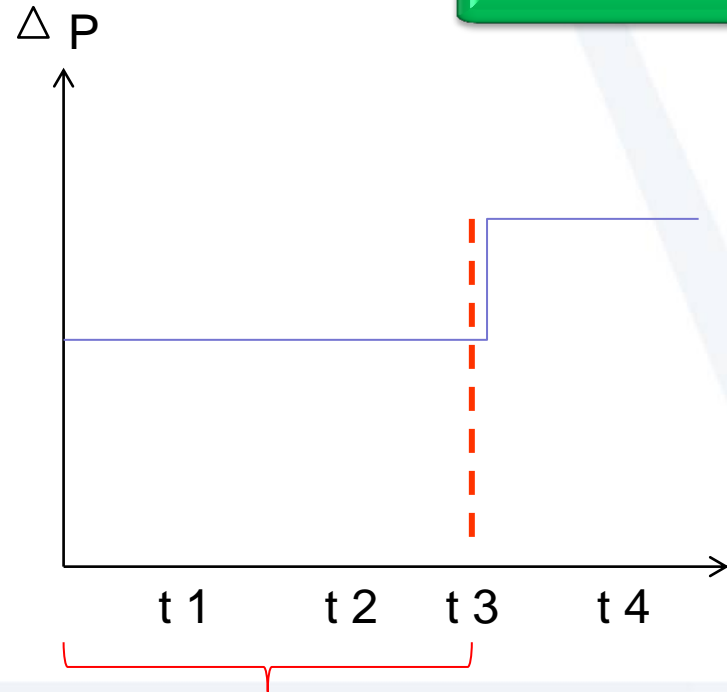
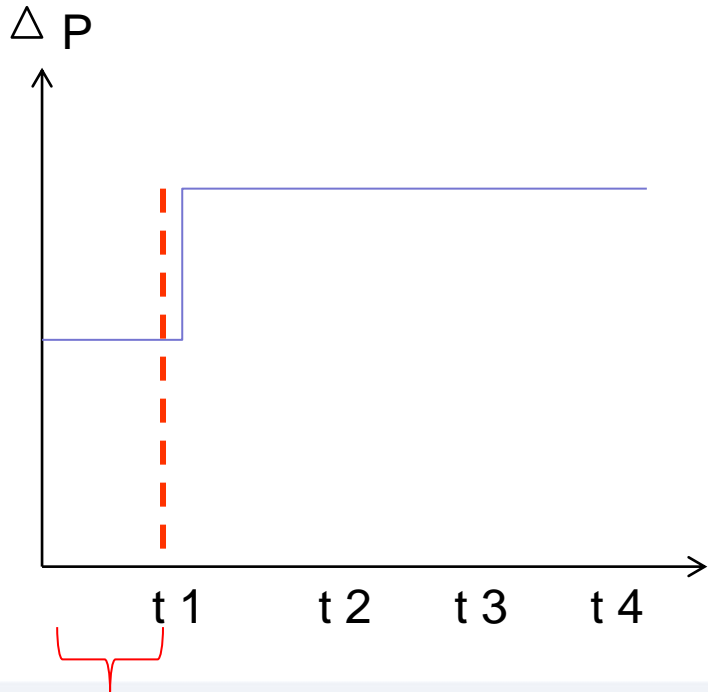
II. Vertical Price Transmission

- Speed

Retailers

Wholesalers

Producers



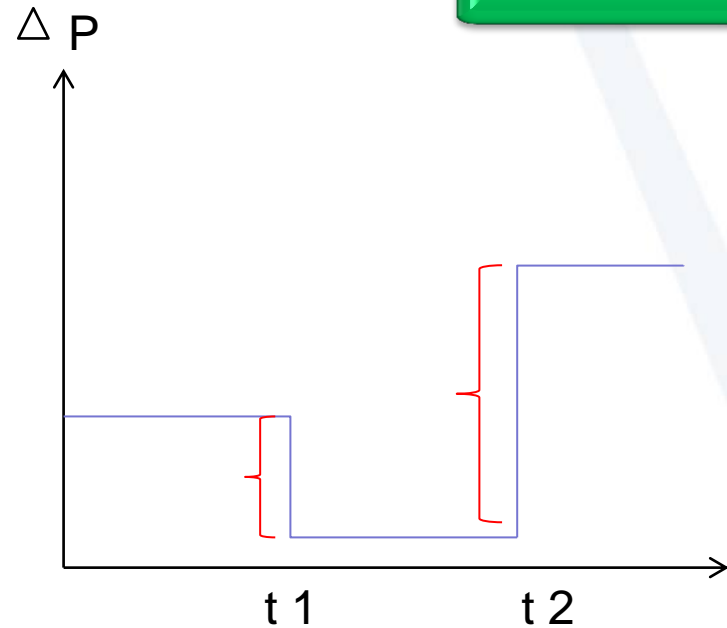
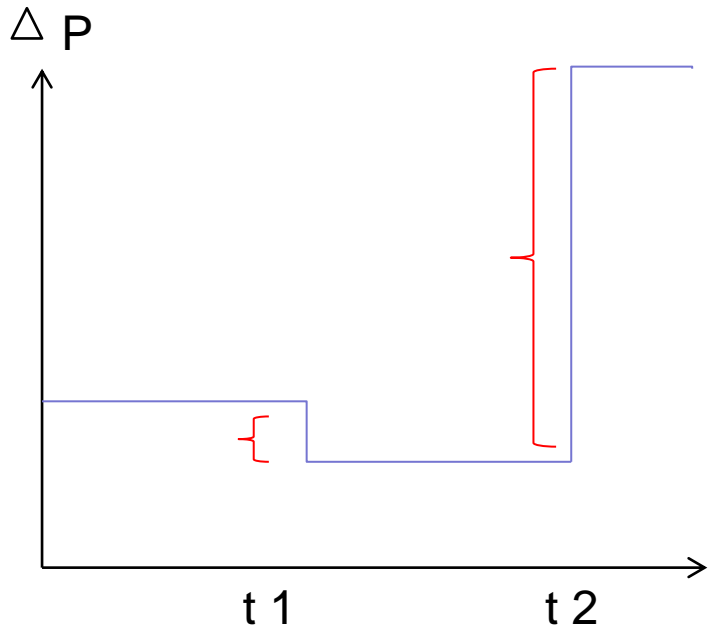
II. Vertical Price Transmission

- Symmetry

Retailers

Wholesalers

Producers



III. Results

- Model Specification

Model	p	a_0	a_2	δ	γ	β_{t-p}	F-test
$\Delta pp_t = a_0 + a_2 t + \gamma pp_{t-i} + \sum_{i=1}^p \beta_i \Delta pp_{t-i} + \varepsilon_t$	2	0.07 (5.60)	0.0002 (4.63)	–	-0.36 (-6.44)	-0.45 (-7.10)	21.63
$\Delta wp_t = a_0 + \gamma wp_{t-i} + \sum_{i=1}^p \beta_i \Delta wp_{t-i} + \varepsilon_t$	1	0.034 (2.72)	–	–	-0.09 (-2.77)	-0.44 (-7.82)	5.03
$\Delta rp_t = a_0 + \delta D_L + \gamma rp_{t-i} + \varepsilon_t$	2	0.08 (10.12)	–	0.03 (11.10)	-0.12 (-10.09)	–	5.46

III. Results

- Unit Root Test

Variable	Test	Lags	$H_0: \gamma = 0$	Lags	$H_0: \Delta\gamma = 0$	t-statistics critical values at 5% level
PP	ADF	8	-3.11	7	-6.98	-3.41
WP	ADF	2	-2.24	1	-16.44	-2.86
RP	UR	7	-3.55	-	-	-2.88

III. Results

- Cointegration Test

Variable	Lags	R ₀	LR	P-Value	t-statistics critical values at 5% level
WP	9	0	27.75	0.003	20.16
PP		1	1.89	0.794	9.14

III. Results

- Granger Causality Test

Null Hypothesis	F-Statistics	Prob
PP does not cause WP	3.97	0.02
WP does not cause PP	2.81	0.06

III. Results

- VECM

$$\begin{aligned}
 \Delta WP &= -0.01^* - 0.45^* \Delta WP_{t-1} - 0.09 \Delta PP_{t-1} - 0.09^* \\
 &\quad \begin{matrix} -2.72 & -8.26 & -1.43 & -3.51 \end{matrix} \\
 \Delta PP &= +0.02^* - 0.02 \Delta WP_{t-1} - 0.15^* \Delta PP_{t-1} + 0.11^* \\
 &\quad \begin{matrix} 4.05 & -0.48 & -2.43 & 4.78 \end{matrix}
 \end{aligned}
 \left[WP_{t-1} - 1.83 PP_{t-1} \right]$$

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 \end{aligned}$$

III. Results

- VECM

$$\begin{aligned} \Delta WP &= -0.01^*_{-2.72} - 0.45^*_{-8.26} \Delta WP_{t-1} - 0.09_{-1.43} \Delta PP_{t-1} - 0.09^*_{-3.51} [WP_{t-1} - 1.83 PP_{t-1}] \\ \Delta PP &= +0.02^*_{4.05} - 0.02_{-0.48} \Delta WP_{t-1} - 0.15^*_{-2.43} \Delta PP_{t-1} + 0.11^*_{4.78} [WP_{t-1} - 1.83 PP_{t-1}] \end{aligned}$$

- AECM

$$\Delta WP_t = -0.001_{(-0.08)} - 0.432^*_{(-7.48)} \Delta WP_{t-1} - 0.056^*_{(-0.81)} \Delta PP_{t-1} - 0.129^*_{(-2.54)} ECT^+ - 0.169_{-1.47} ECT^-$$

VI. Conclusions

- Price changes at the consumer level are not being efficiently transmitted to other levels of the marketing chain
- Wholesalers and producers prices are co-integrated in the long-run but not so in the short-term.
- The speed of price transmission is asymmetric being significantly faster when producers' prices increase.



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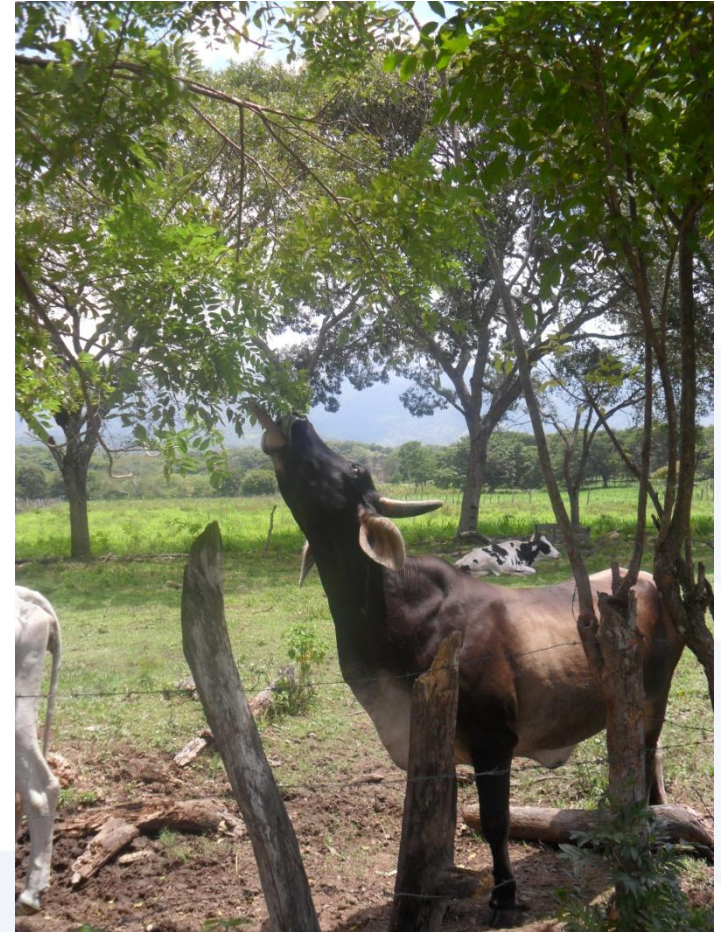
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V. Policy Implications

- Efforts to increase small dairy producers competitiveness should be accompanied with actions to increase the efficiency of the markets in which they operate.
 - Improving infrastructure.
 - Control over the concentration of market power.
 - Reducing transaction costs.





Thank you