Transfer efficiency analysis of margin based programs

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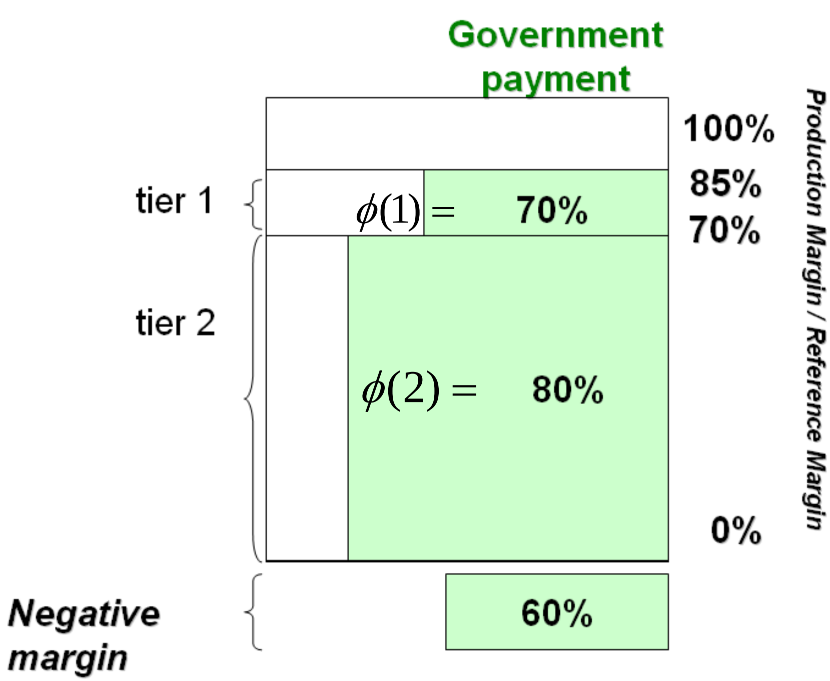
AgriStability

- Deficiency payment which puts a floor on farm income defined as a reference "production margin"
- Production Margin = Allowable commodity sales – Allowable expenses + Accrual Adjustment
  - Exclude expenses that are within a farmer's control
  - Exclude expenses that are subject to moral hazard

Pulling the Trigger

- Reference Margin
  - "Olympic" average of the last five years' production margins, with highest and lowest years dropped
- Payment Trigger: Payments are made when the program year margin falls below the reference year average



Size of government payment is inversely proportional to loss

How do you measure the impact of AgriStability?

- Judge program's effects by how it affects producers' incentives …specifically the incentive to access larger government payments
  - Alter outputs and inputs to access more program payments
- Prior studies:
  - Econometric estimates of risk reduction (Bakhshi 2009)
  - Stochastic simulation and capital budgeting (Schaufele, Unterschultz and and Nilsson (2010)
- Measure the effects on a producer's input choice decision rule:

Representative Producer's Problem

$$EU(\pi)=\int_{\omega_{\min}}^{\omega_{tier2}} U(\pi(\omega)+0.8\cdot(RM-PM(\omega))\cdot f(\omega)d\omega+\int_{\omega_{tier2}}^{\omega_{tier1}} U(\pi(\omega)+0.7\cdot(RM-PM(\omega)))\cdot f(\omega)d\omega+\int_{\omega_{tier1}}^{\omega_{\max}} U(\pi(\omega)\cdot f(\omega)d\omega$$

where $\pi(\omega)=\sum_{i=1}^{3}\left[R(x,\omega)_i-\sum_{j=1}^{10} V_j\cdot X_{ij}\right]$ and $PM(\omega)=\sum_{i=1}^{3}\left[R(x,\omega)_i-\sum_{j=1}^{6} v_j\cdot x_{ij}^{eligible}\right]$

$$\left(\frac{EMU(3)}{EMU}\cdot\frac{EVMP_i(3)}{EVMP_i}+\sum_{i=1}^{2}(1-\phi(i))\cdot\frac{EMU(i)}{EMU}\cdot\frac{EVMP_j(i)}{EVMP_j}\right)\cdot EVMP=v_j\cdot\left[1-\sum_{i=1}^{2}(1-\phi(i))\cdot\frac{EMU(i)}{EMU}\right]+\left[1-\Delta\right]RP+\Phi\operatorname{cov}(G,VMP_j)$$

$0<(1-\Omega)<1$

$0<(1-\Psi)<1$ if eligible
Else =1

0< & <1

neg

where

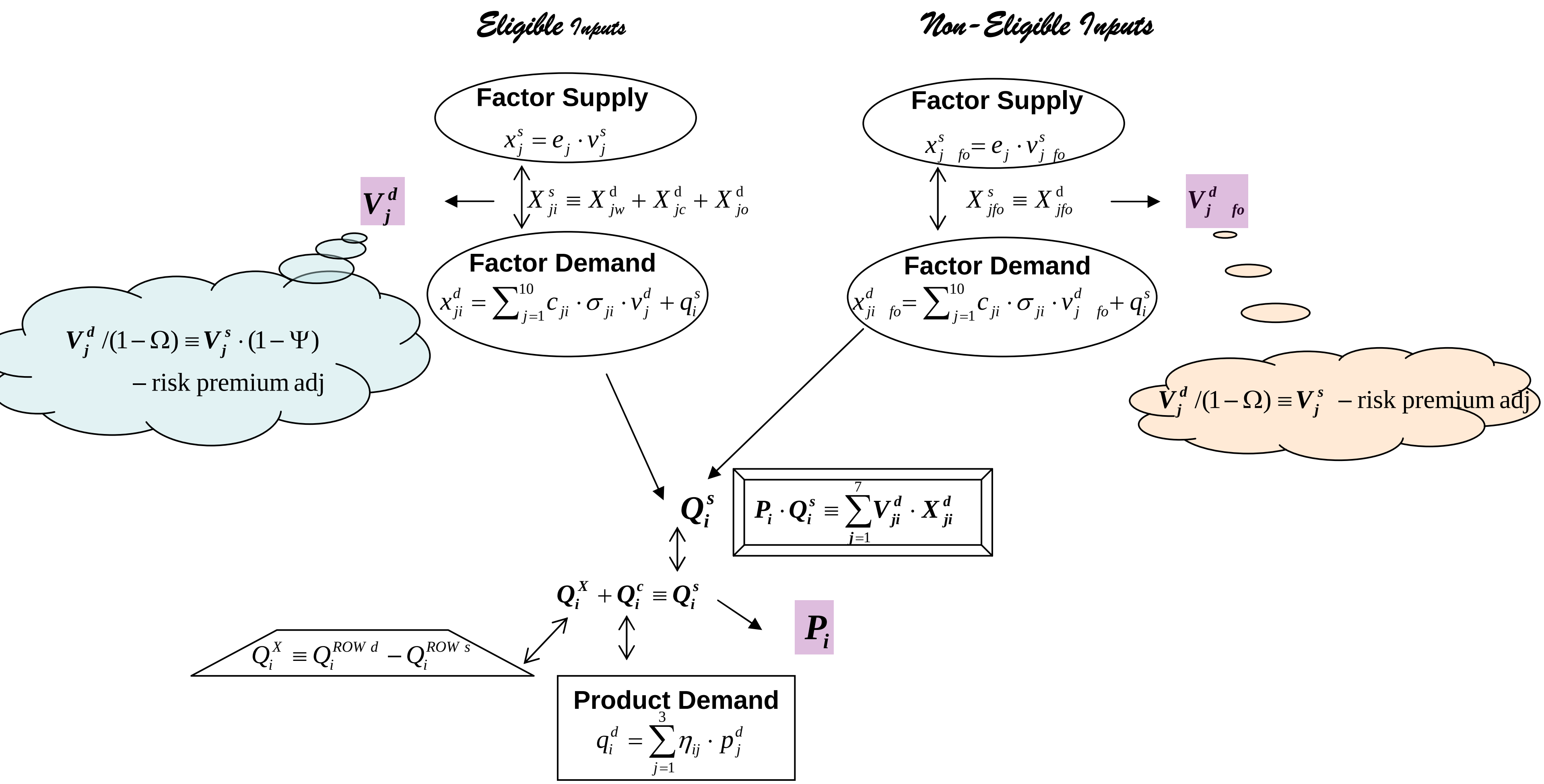
$$(1-\Delta)RP=\lambda\cdot\left(1-0.7\cdot EMU(1)/EMU-0.8\cdot EMU(1)/EMU\right)\operatorname{cov}(\pi,VMP_j)$$

$$\lambda=-EU''/EU'$$

$$\Phi=\lambda\cdot(0.2\cdot EMU(2)/EMU-0.3\cdot EMU(1)/EMU)$$

Do a stochastic simulation to get parameters for input decision rule and then employ an equilibrium displacement model

Equilibrium Displacement Model



Production Effects & Transfer Efficiency

- Percentage change in production due to AgriStability

	MH & Re-Allocation	Risk Reduction	Net Effect
Wheat	-5.9%	7.0%	1.1%
Coarse Grains	-2.4%	7.7%	5.3%
Oilseeds	-6.7%	6.6%	-0.01%

- Transfer Efficiency

$$TE = \frac{\Delta PS}{\Delta CS + \Delta GOV}$$

- Economic Impacts (Millions)

ΔPS	ΔCS	ΔGOV	TE
352	11	823	42%