

# The costs (welfare and fiscal) of excess procurement

Bharat Ramaswami

Next Generation Fiscal Reform Frameworks to deliver effective counter-cyclical policy: Indian and International Experiences

12-13 December 2014

# Co-authors

- Sridhar Seshadri, Indian School of Business
- Krishnamurthy Subramaniam, Indian School of Business

# Two pillars of food (rice and wheat) policy

- Support Price: open- ended grain purchases at the declared minimum support price (MSP)
- Public Distribution System(PDS) – grain sales at prices below the cost of grain.

# About this paper...

- Focus here is on the welfare consequences of support prices.
- Approach here is to take PDS as given. This is not to suggest that it cannot be questioned.
- Indeed, much is already known about the efficiency of subsidy transfers, targeting and functioning of PDS shops.

# The efficiency (economist) view of support prices

- Provides insurance to farmers (valuable since access to formal insurance is limited).
- Together with public distribution and annual storage, the intervention stabilizes consumption and provides insurance to consumers.
  - Distribution less than purchase when supplies are high
  - Distribution more than purchase when supplies are low
  - Distribution equals purchase (i.e., net intervention is zero) over a long enough spell (say 5 years)

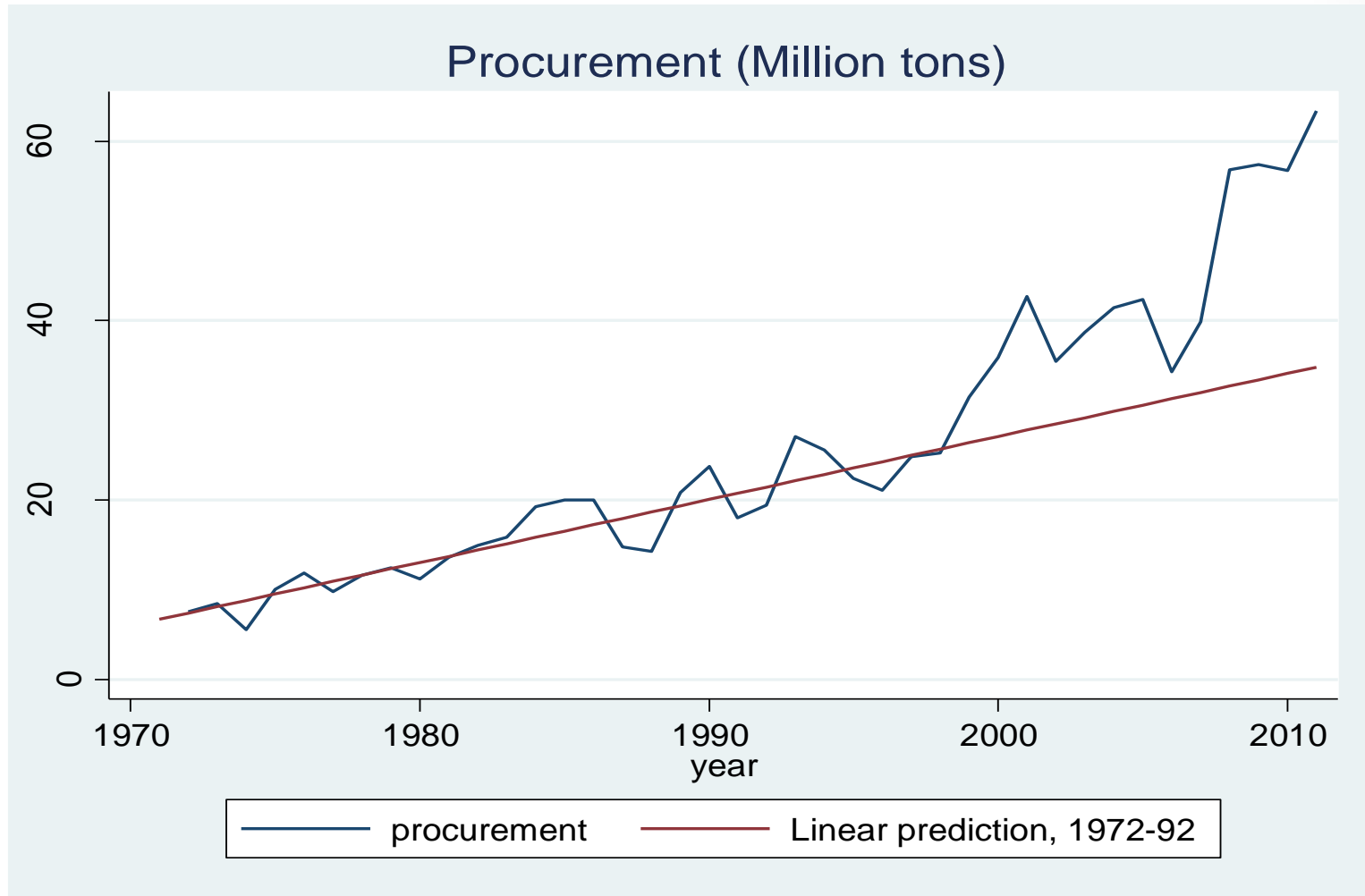
# Equity (political) view of support prices

- Farmers are poor and cannot cope with low and volatile prices.
- The support is minimal when compared to salaries of public officials and infrastructure spending in urban areas.
- Rich countries use it to aid transition out of agriculture and reduce urban-rural gaps.
- Price support is a mechanism for income transfer.

# Food policy debates: procurement

- Type A Criticisms:
  - Support prices have been too high
  - Distorts the allocation of resources in favour of the supported crops and away from crops with more income elastic demand.
  - Costs of government agencies that do procurement are too high
- Type B Criticisms:
  - Not enough of procurement from states other than a few.
  - In many states, farmers do not receive procurement prices.
  - Inputs are getting more expensive – procurement prices are not high enough to alleviate farmer distress.

# Grain Procurement: Observed and Trend

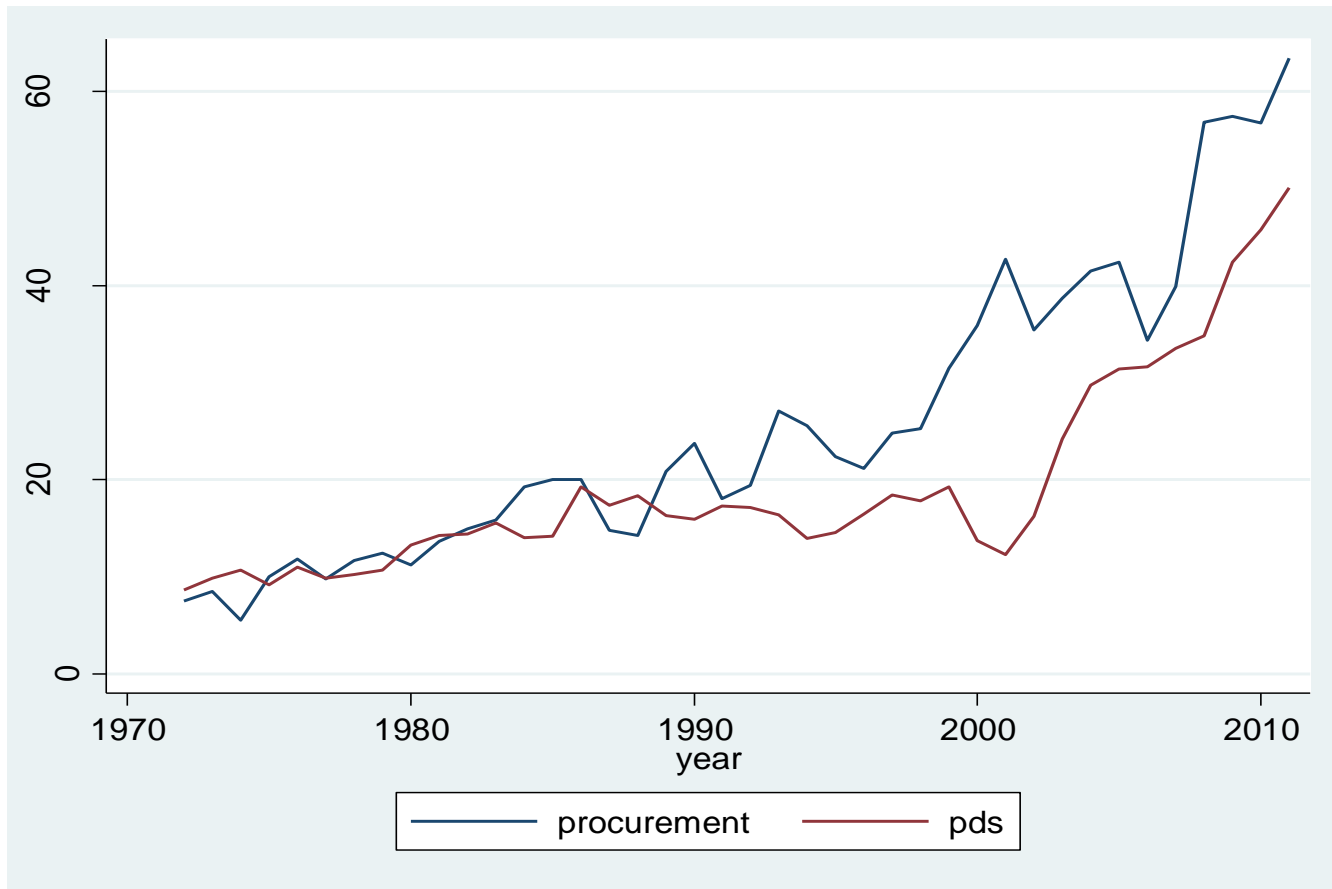




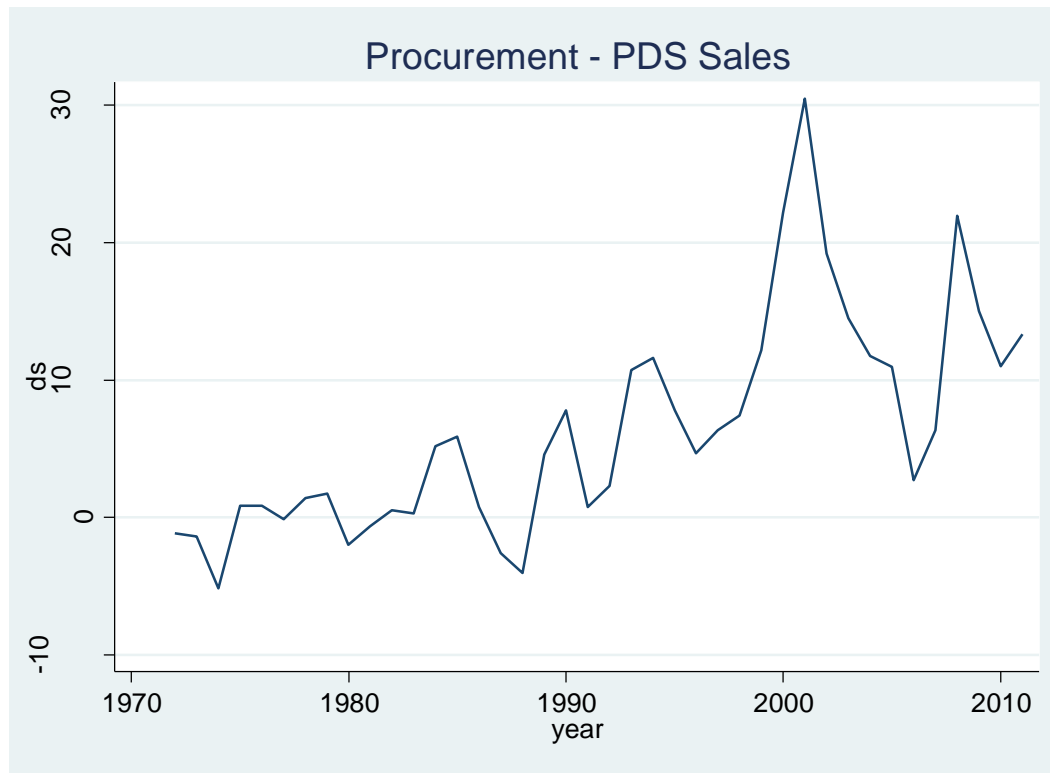
# Procurement Expansion

- Procurement starts rising (above the trend) in the late 1990s.
- The lowest procurement in the 2000s (34 million tons in 2006) higher than any level in the 1990s.

# Procurement and Distribution



# Difference between procurement and PDS sales



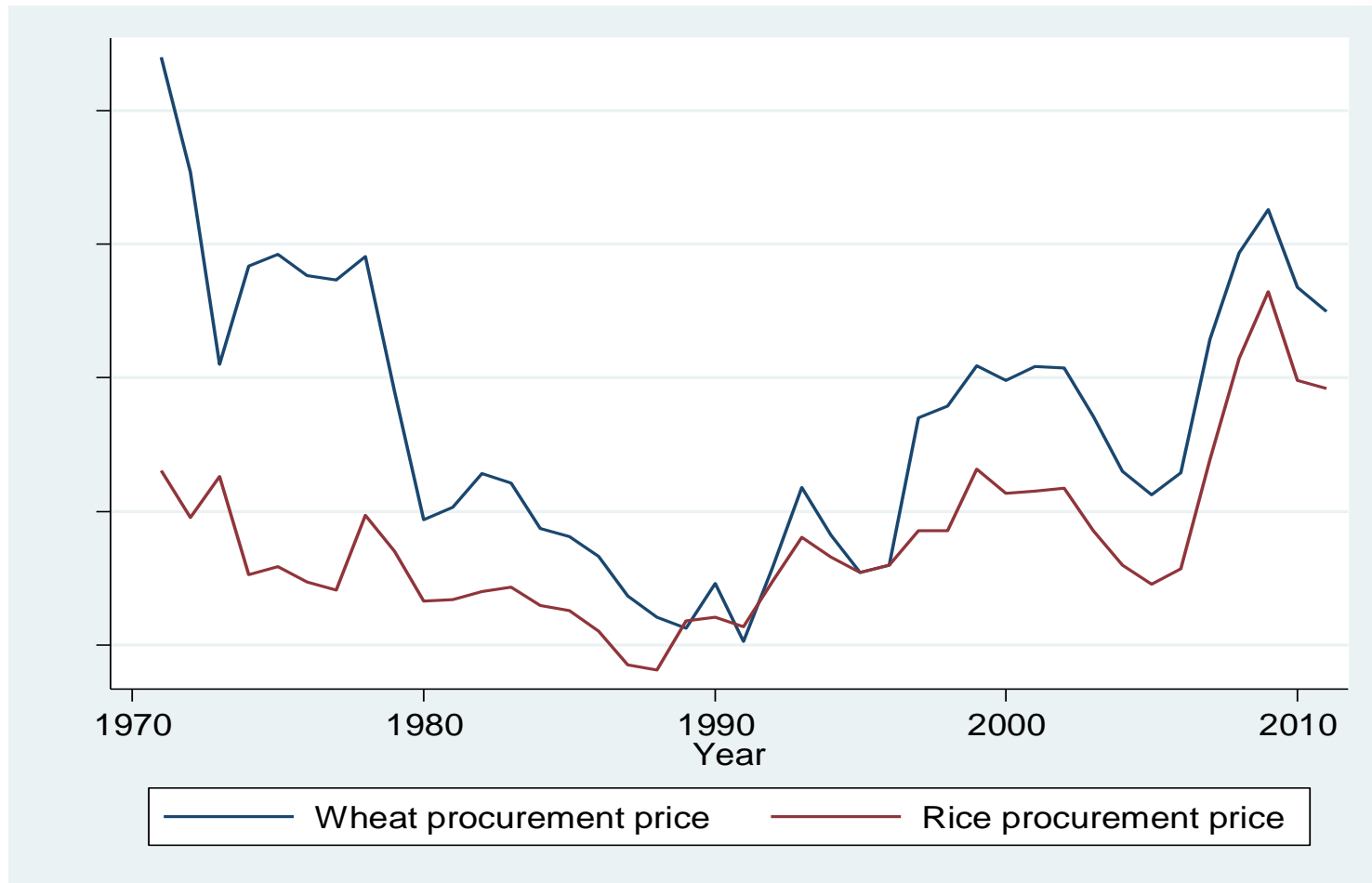
# Procurement and PDS

- The increase in procurement is followed by an increase in distribution (trend break in early 2000s)
- Yet, since 1989, procurement has exceeded PDS sales **in every year.**
- Close match between procurement and PDS in the 70s and 80s.
- This trend does not extend beyond the early 90s.

# Story so far...

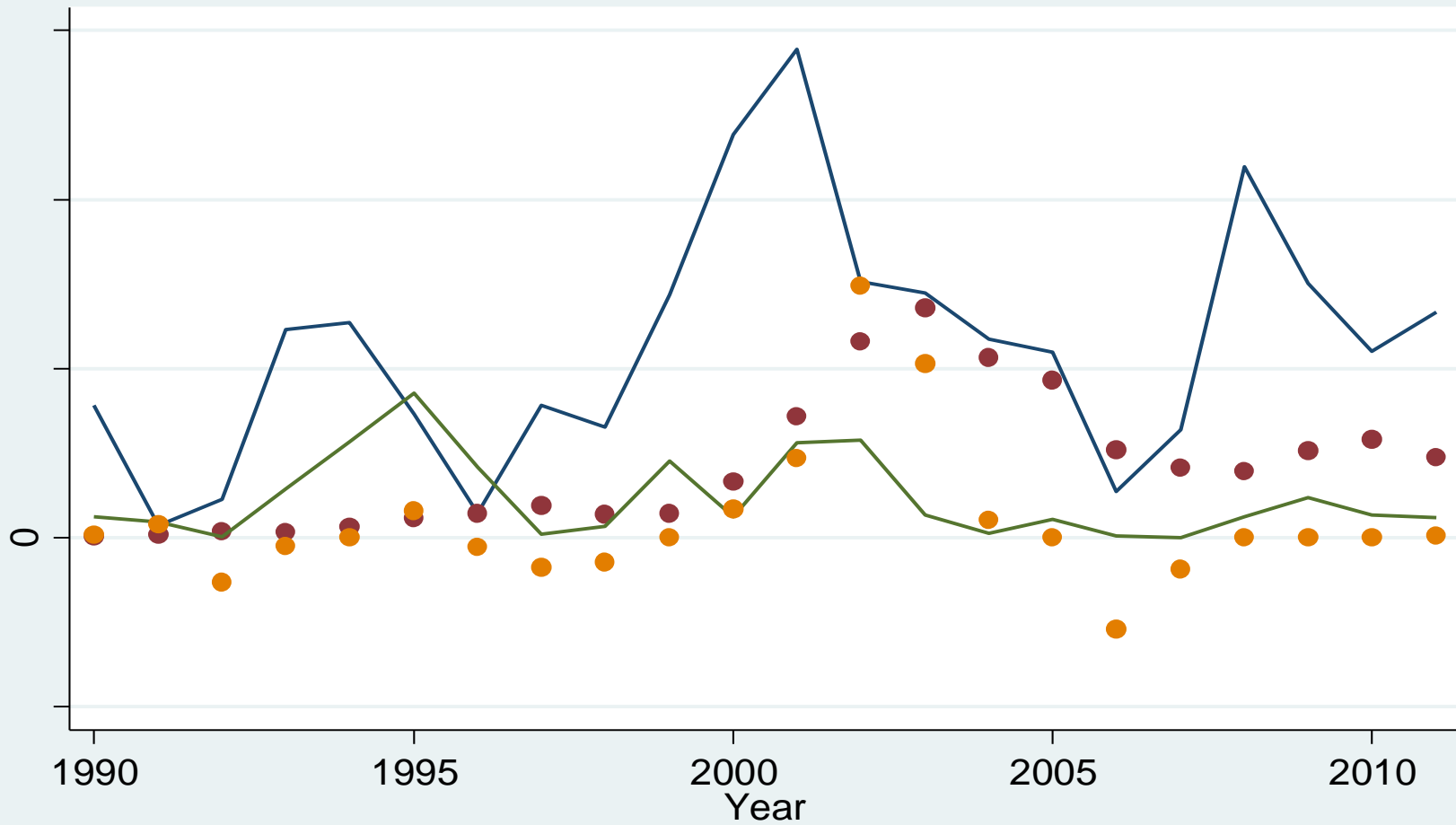
- Procurement approximately doubled from 10 to 20 million tons from 1971/2 to 1991/2. In the next 2 decades, it tripled from 20 to 60 million tons.
- `Zero' intervention on average prior to 1990: corresponds to stabilization.
- Not so after the 1990 or so.
- What's happening?

# Procurement price of Wheat and Rice (Rs/ton) in 2004/05 prices



# Managing excess grain

- Where did the excess procurement go?
  - Expanding the PDS (expanding entitlements from 10 to 35 kg, expanding Antayodaya Anna Yojana, freezing issue price)
  - Welfare schemes
    - Mid-Day-Meal, Nutrition Programme, SC/ST/OBC Hostels, Welfare Institutions & Hostels, Annapurna, Sampoorn Gramin Rozgar Yojna (SGRY), National Food for Work, Programme, Scheme for Adolescent Girls, Pregnant & Lactating Mothers, and World Food Programme (WFP)
  - Exports
  - Open market sales
  - Stocks (and then all of the above in later years)





# Welfare programs, Market Sales and Exports

- All of these variables follow (with a year's lag) excess procurement.
- These variables are used to adjust stocks to desired levels.
- These can therefore be seen as responses to the fiscal burden of excess procurement.
- The entire excess, though, is not disposed off – what remains gets added to the stock.

# Thinking about the costs of excess procurement

- Suppose a no-intervention economy.
- Consumer demand is  $D$ , supply is  $S$ . Their equality determines price  $p$  and quantity  $Q$ .
- Government decides to supply a fraction  $\lambda$  of  $Q$  at a fraction  $\gamma$  of the price  $p$ . Let  $X = \lambda Q$
- Government obtains the grain  $X$  by purchasing at market prices.
- So what happens to equilibrium market price and quantity?

# Consumer demand

- Consumer demand: As the subsidy supplies a part of what consumers would have consumed, it is an infra-marginal transfer.
- Hence, the subsidy is equivalent to a income/cash transfer.
- Now the income elasticity of food staples is very low.
- Suppose it is zero. Then the intervention does not change aggregate food demand.

# Market demand

- In the grain market, demand comes from two sources: consumers and government.
- Market demand from consumers is  $Q - X$  and government demand is  $X$ .
- The aggregate demand from both sources is  $Q$ .
- As the government is buying at market prices, (not price supports), there is no shift in supply either.

# Bottom line

- If the intervention was just this and no more, there would be no impact on prices.
- Consumers are better off, government worse off, and producers are unaffected. No change in total welfare (sum of changes in welfare of individual agents).
- Of course, if the subsidy is delivered inefficiently, then consumer welfare does not rise as much and total welfare declines.
- But this is not the focus of this paper.

# For welfare effects, we need...

- If, in every year, procurement = distribution, then such a government intervention does not affect market prices and is therefore not a support price.
- If procurement > distribution, then in those years, grain supplies in the open market are lower than what it would have been normally and the market price is higher.
- Similarly if procurement < distribution (possibly only if stocks are used in place of purchases), market price would be lower.

# Modeling intervention

- In every state of the world, government is committed to buying  $X$  (grain required for PDS)
- In addition, government declares a floor support price before the random production shock (aggregate uncertainty) is known.
- If market price  $>$  support price, government procurement (at market prices) = PDS sales
- Otherwise, government purchases at support price. Procurement  $\geq$  PDS sales.
- Difference between procurement and PDS sales is unsold stocks.
- We do not allow stocks to substitute for procurement in meeting the PDS requirement (because we have not observed it since 1990)

# Example: how the intervention works

■ Suppose market price could take two equally probable values depending upon exogenous shocks to production:

- Rs. 800 per quintal and Rs. 900 per quintal

■ If MSP is set between 801 and 899, then government has to intervene when

- Production is high => Price equals 800
- Does not have to intervene when price equals 900
- Thus the government intervenes with probability 0.5
- If MSP is set at 901 or higher, then government always intervenes



# Take away from example

- Whenever the intervention occurs at MSP, then by definition, government procurement is higher than distribution (because the price floor is breached even with government purchases of X).
- Note that, in principle, purchase at MSP can also be lower than distribution if there is substantial stock withdrawal. We have ruled that out because that has not been observed.
- We have observed that since 1989, procurement > distribution which means MSP has been effective every year.
- Hence prices have been higher than what they would have been otherwise (i.e., no intervention or intervention with procurement = distribution)

# Welfare Change

- What is the loss/gain to society from such an intervention?
- $dW/d(msp)=(v - msp)(dQ_p/dmsp)$

where  $W$  is welfare,  $v$  is the value of unsold stocks,  $Q_p$  is the quantity of unsold stocks (excess of procurement over distribution) and  $msp$  is minimum support price .

# Welfare change = Fiscal cost of excess procurement

- The second term is increment in excess procurement due to an increase in support price.
- The first term is the fiscal cost of a unit of such stocks – the difference between its value and its acquisition cost.
- Note that welfare consequences flow from excess procurement.

# Estimating the Fiscal cost of excess procurement: $(dQ_p/dm_{sp})$

- Regress excess procurement (for rice and wheat separately) on the support price (in constant Rs. 2004/05 prices), and other controls.
- Controls: harvest, deflated issue price and structural shift dummy variables for 1997 (introduction of targeted PDS) and for 2002 (when PDS entitlements were raised to 35 kg per household).
- Regression is done in first differences to rule out spurious correlations because of common trends.

# Excess procurement coefficients

- One rupee (2004/05 prices) increase in the procurement price of rice results in an increase in excess procurement of 0.35 million quintals or 350,000 quintals.
- The similar coefficient for wheat is 0.225 million quintals or 225,000 quintals.
- The effect of a one-rupee increase for other years is computed by appropriately deflating the coefficient.

# Estimating the fiscal cost of excess procurement : $(v - msp)$

- The value of unsold stock,  $v$  is taken to be the average sales realization (ASR) of FCI over all types of sales (PDS, welfare programs, open market sales, exports).
- However, not all excess procurement is disposed off in this manner. Some of it is added to stocks and subsequently sold in one of the above programs. In this case,  $v$  must be adjusted for storage costs (SC).
- $v = \rho ASR + (1-\rho)(ASR-SC)$

Year	Excess Procurement (mill tons)	Proportion disposed off in current year
2006	2.738	1
2007	6.364	0.358643935
2008	21.946	0.23587852
2009	15.013	0.501399454
2010	11.008	0.648785698

Rupees per quintal

Year	ASR (rice)	Storage cost (rice)	MSP (rice)
2006	643	226.44	620
2007	610.73	163.39	745
2008	590.95	260.84	900
2009	661.55	294.19	1000
2010	611.93	322.20	1000

Rupees per quintal

Year	ASR (wheat)	Storage cost (wheat)	MSP (wheat)
2006	456	452.88	700
2007	457.42	326.77	850
2008	522.27	521.67	1000
2009	585.36	588.38	1080
2010	551.76	644.40	1100



# Welfare change (fiscal cost) of excess procurement, Rupees Billion

	Rice	Wheat	total	Food subsidy	As % of food subsidy
2006	-0.2	-12	-12	238	-5
2007	-13	-76	-89	313	-29
2008	-54	-97	-151	437	-35
2009	-52	-84	-137	582	-23
2010	-78	-128	-206	629	-33

# Conclusions

- Welfare loss is sizeable (even without taking into account the cost of distortions on the production side)
- Even if India wins the right to hold stocks not bound by WTO, it is unlikely it will receive the right to export from government stocks.
- That reduces the value of unsold stocks and increases the welfare loss from holding them. Fundamental reform is not to have excess stocks in the first place.

# Reforms

- Fundamental reform is not to have excess stocks in the first place.
- Move to cash transfers even partly would alleviate the pressures on stocks.
- Unbundle procurement for PDS from procurement for annual storage.
- The latter should be responsibility for a separate agency that would have responsibility to manage stocks.
- Will make stocks and expenditure on stocks visible.

# Reforms...

- Storage policies for stabilization are hard to execute.
- It is easier to build stocks than to take the call to unload them.
- As a result, price stabilization has failed.
- India lacks a protocol for stock sale (when is it triggered, at what price).
- This should be done and implemented by the agency in charge of annual stocks.