



# ***Using supply chains to regulate labor markets: Evidence from the apparel industry***

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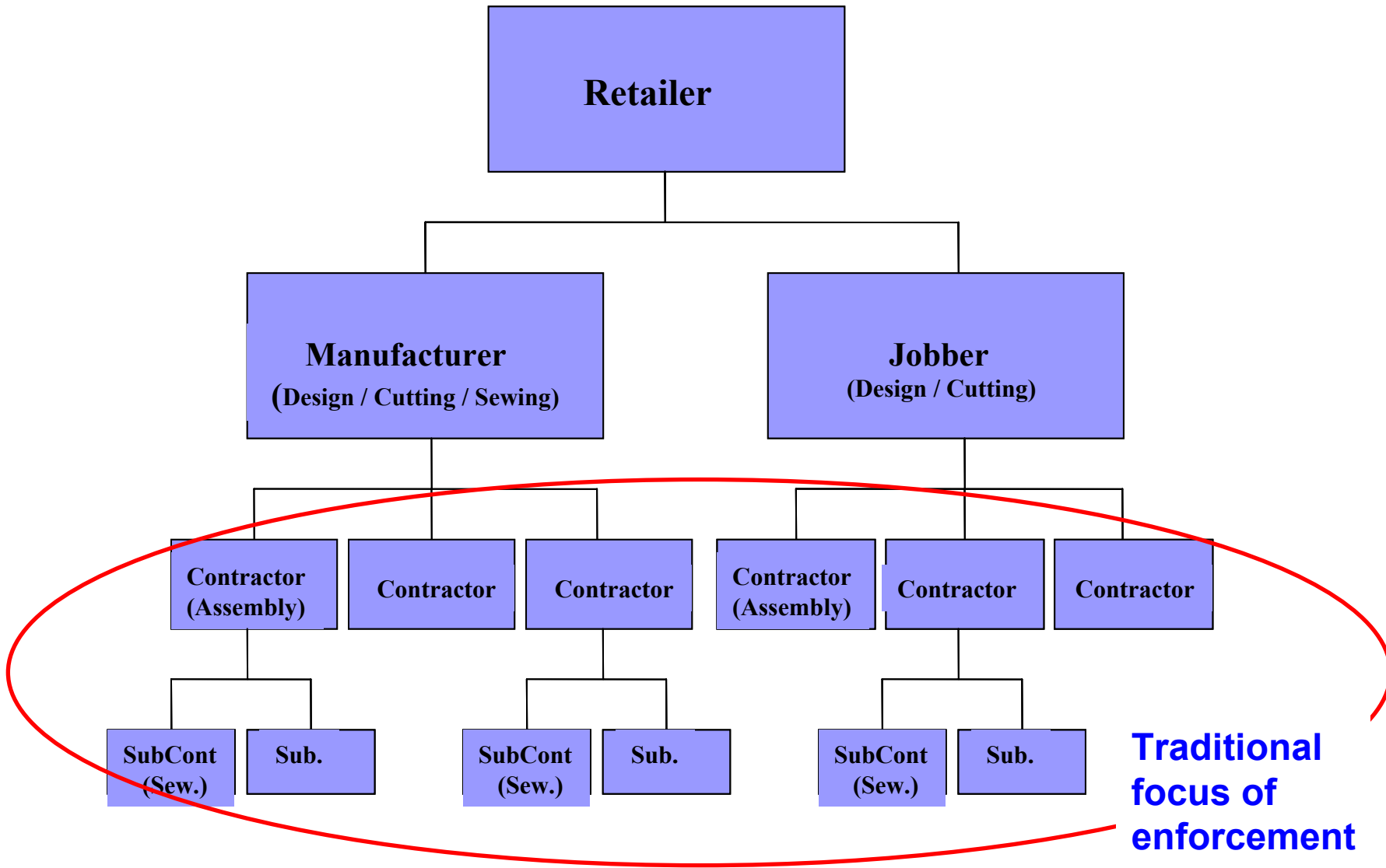
# Regulating via supply chains: Apparel industry as case in point

- Longstanding sweatshop problem--Traditional industry structure highly subject to noncompliance;
- Longstanding government efforts to curb minimum wage and labor standards violations;
- Supply chain structure has parallels with other hard to regulate, low wage industries;
- Recent DOL initiatives provide potential new interventions here and elsewhere.

# Economics of minimum wage compliance

- Minimum wage: An area of intense academic debate
- Minimum wage compliance: Can we assume perfect compliance?
- Significant literature says “no”!
  - Becker (1968); Stigler (1970); Polinsky & Shavell (2000)
  - Ashenfelter & Smith (1979)
  - Grenier (1982); Chang and Ehrlich (1985)
  - Yaniv (2001)

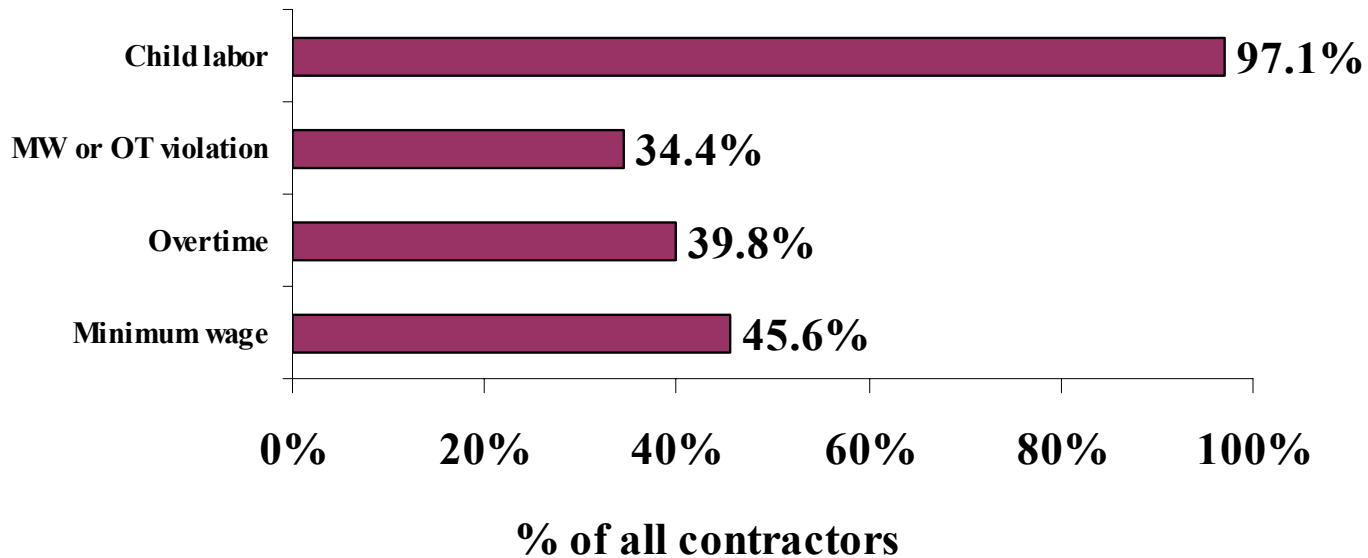
# Apparel industry organization



# Enforcement of FLSA in apparel industry: 1996-2000

<i>Quarter</i>	No. of Investigations	Back wage per employee <sup>a</sup>	Civil fine per violator <sup>b</sup>	Back wage per violator <sup>c</sup>	% investigations w/ violations <sup>d</sup>
1996-Q3	223	\$ 281	-	\$ 5,338	58.7%
1996-Q4	194	\$ 356	\$ 919	\$ 6,663	60.8%
1997-Q1	293	\$ 376	\$ 1,597	\$ 6,727	42.0%
1997-Q2	212	\$ 356	\$ 511	\$ 4,772	48.1%
1997-Q3	268	\$ 495	\$ 2,434	\$11,296	39.9%
1997-Q4	212	\$ 330	\$ 1,135	\$ 6,175	46.7%
1998-Q1	221	\$ 268	\$ 619	\$ 4,132	36.2%
1998-Q2	201	\$ 432	\$ 1,094	\$ 6,623	49.3%
1998-Q3	232	\$ 347	\$ 819	\$ 5,590	54.3%
1998-Q4	154	\$ 345	\$ 1,960	\$ 6,191	63.6%
1999-Q1	175	\$ 493	\$ 2,462	\$ 11,567	31.4%
1999-Q2	82	\$ 280	\$ 2,352	\$ 4,942	37.8%
1999-Q3	205	\$ 380	\$ 758	\$ 8,232	53.2%
1999-Q4	115	\$ 475	\$ 1,136	\$ 9,625	65.2%
2000-Q1	94	\$ 462	\$ 495	\$ 10,278	41.5%
2000-Q2	100	\$ 687	\$ 1,079	\$ 39,025	46.0%
2000-Q3	120	\$ 1,028	\$ 942	\$ 24,769	53.3%
2000-Q4	125	\$ 662	\$ 3,750	\$ 11,454	58.4%
<b>Mean</b>	<b>179.2</b>	<b>\$ 447</b>	<b>\$ 1,337</b>	<b>\$ 10,189</b>	<b>48.8%</b>
<b>Median</b>	<b>197.5</b>	<b>\$ 378</b>	<b>\$ 1,086</b>	<b>\$ 6695</b>	<b>48.7%</b>
<b>S.D.</b>	<b>61.8</b>	<b>\$ 187</b>	<b>\$ 927</b>	<b>\$ 8,611</b>	<b>9.9%</b>

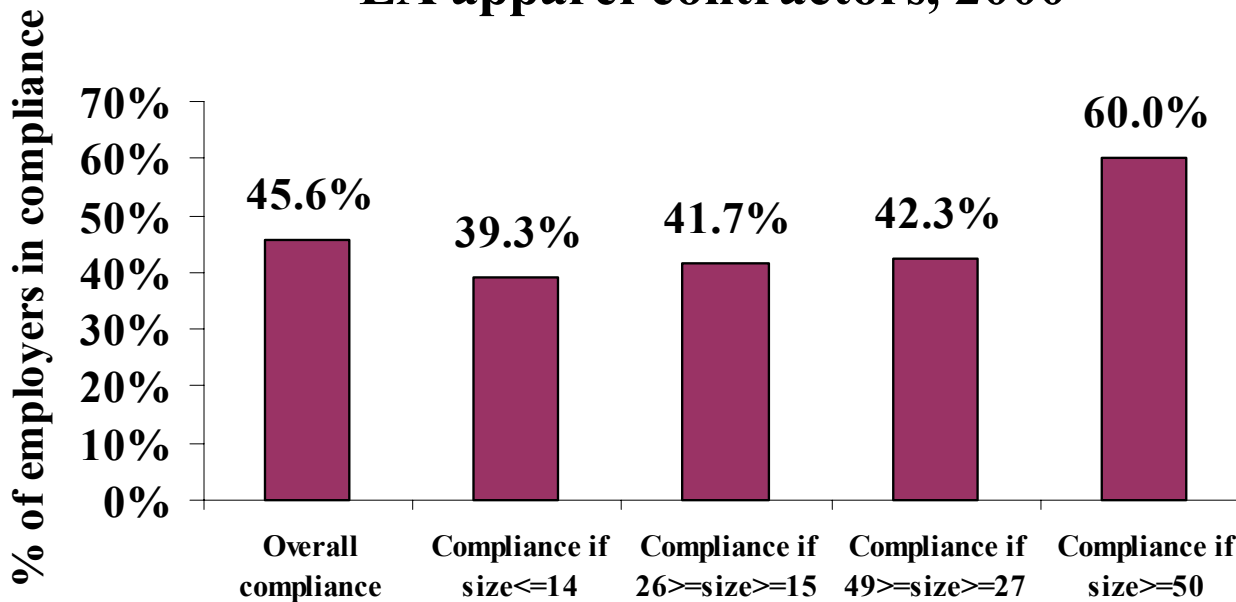
## Contractor compliance with FLSA provisions\* LA apparel contractors, 2000



\* One or more violations of given provision found during investigation

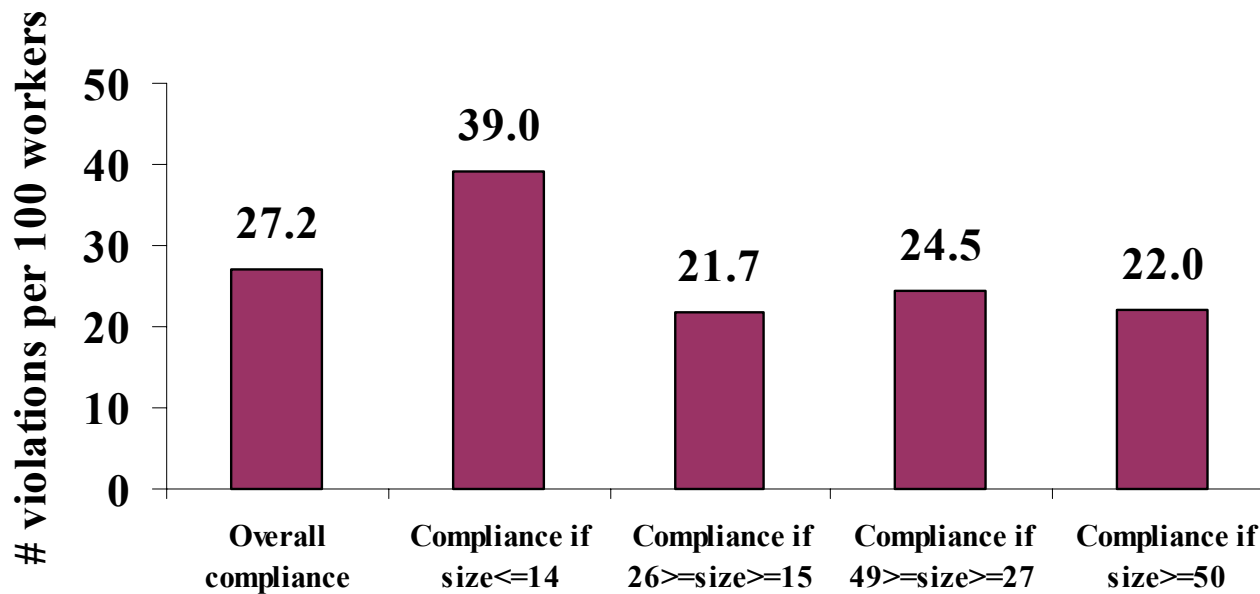
Source: WHD Survey of Southern California Contractors, 2000.

## **% employers in compliance by size LA apparel contractors, 2000**



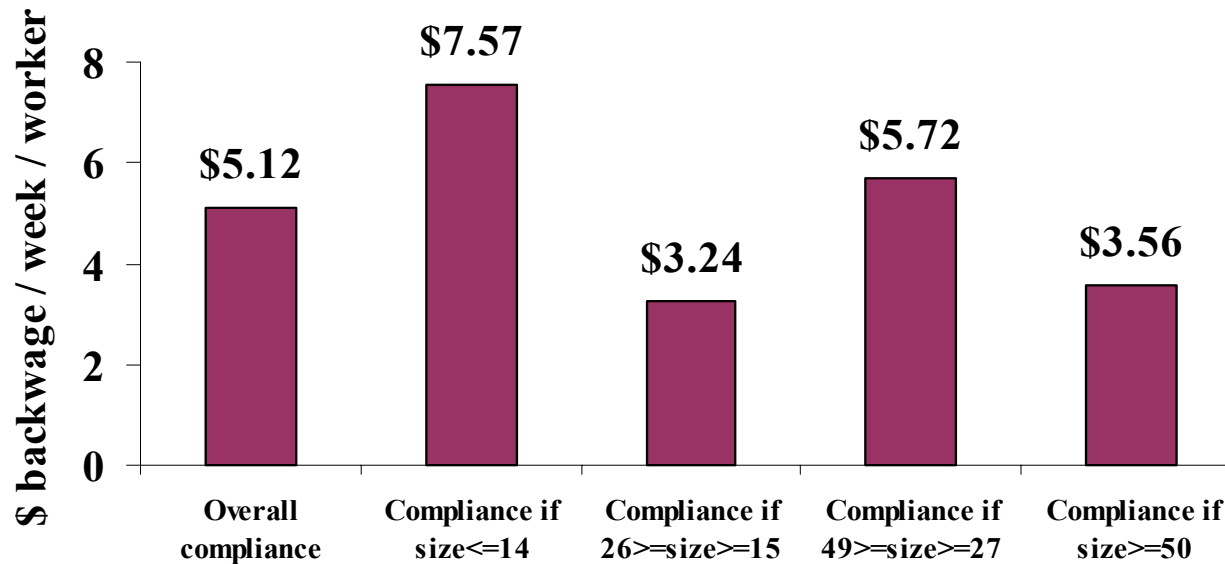
Source: WHD Survey of Southern California Contractors, 2000.

## # violations per 100 employees by size LA apparel contractors, 2000



Source: WHD Survey of Southern California Contractors, 2000.

## \$ backwage / week / worker LA apparel contractors, 2000

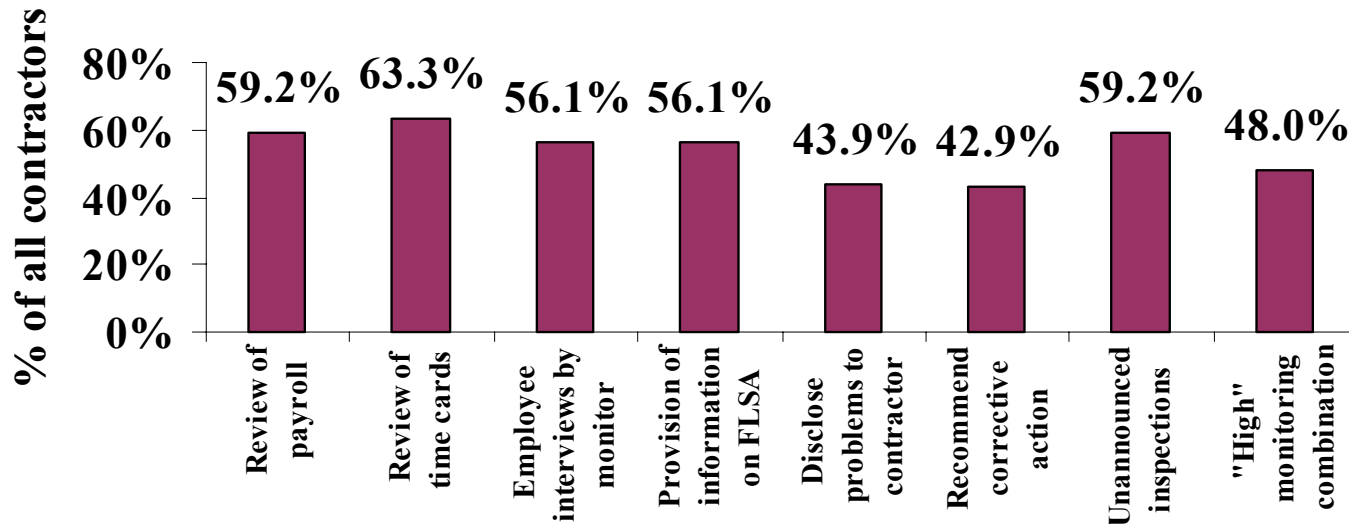


Source: WHD Survey of Southern California Contractors, 2000.

# Lean retailing and new methods of regulating labor standards

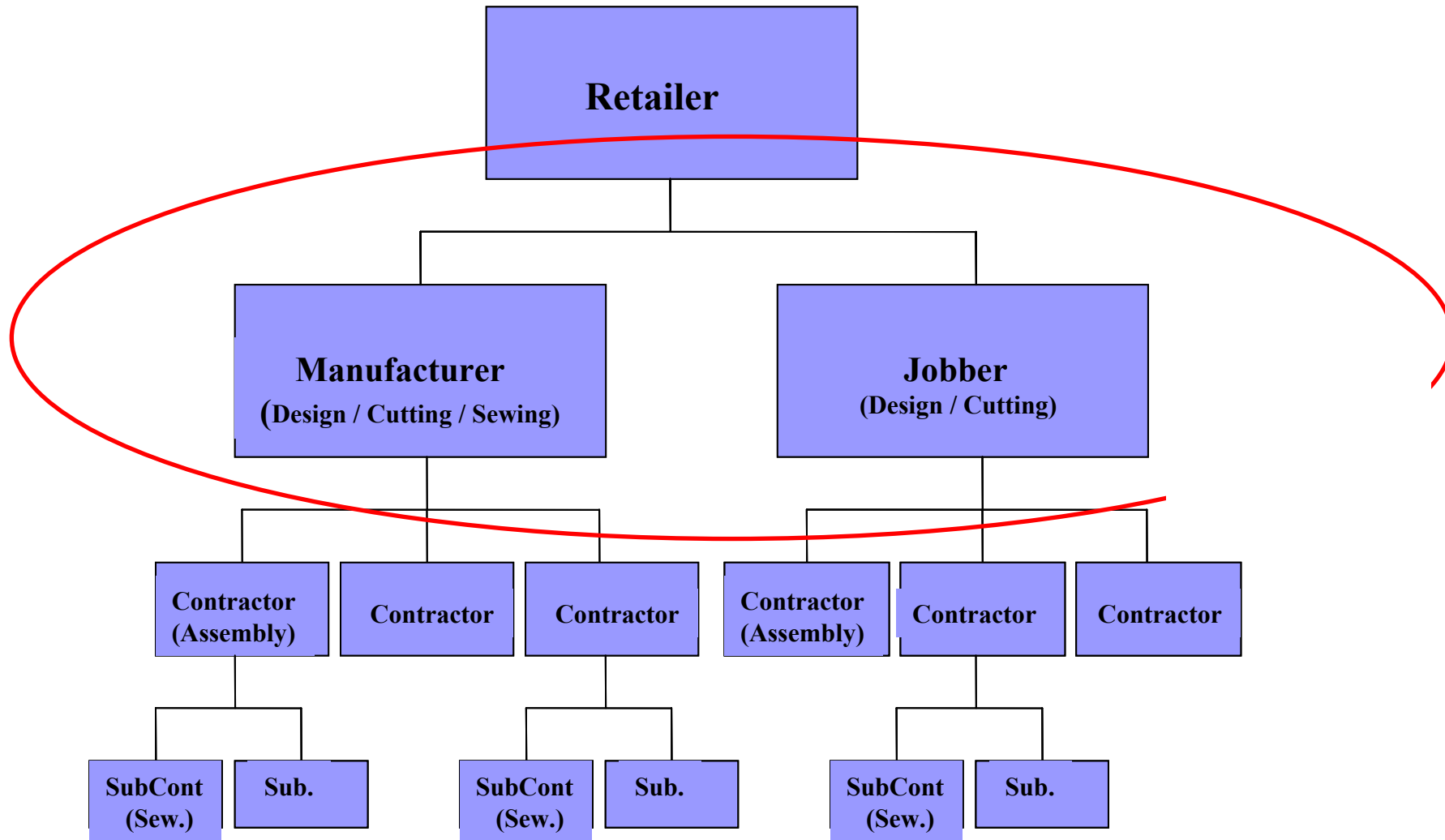
- Advent of “lean retailing” (Abernathy *et. al.*)
- Supply chain vulnerable to interruptions;
- FLSA Hot Cargo provision of 1938 (Section 15a);
- Provides DOL-WHD tool to negotiate “Compliance Monitoring Agreements”
- CMAs operate at two levels--manufacturer and contractor
- Do they work?

## Incidence of different types of monitoring arrangements LA apparel contractors, 2000



Source: WHD Survey of Southern California Contractors, 2000.

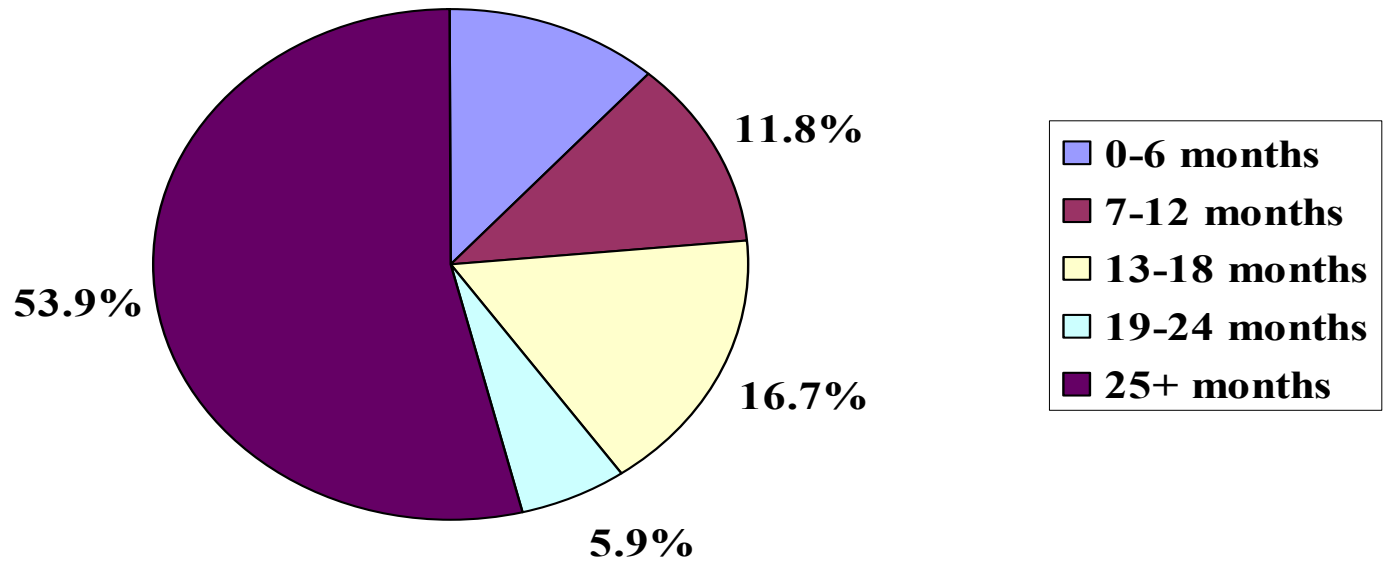
# Using supply chains: Alternative focus



# Economics of minimum wage: Predictions about compliance

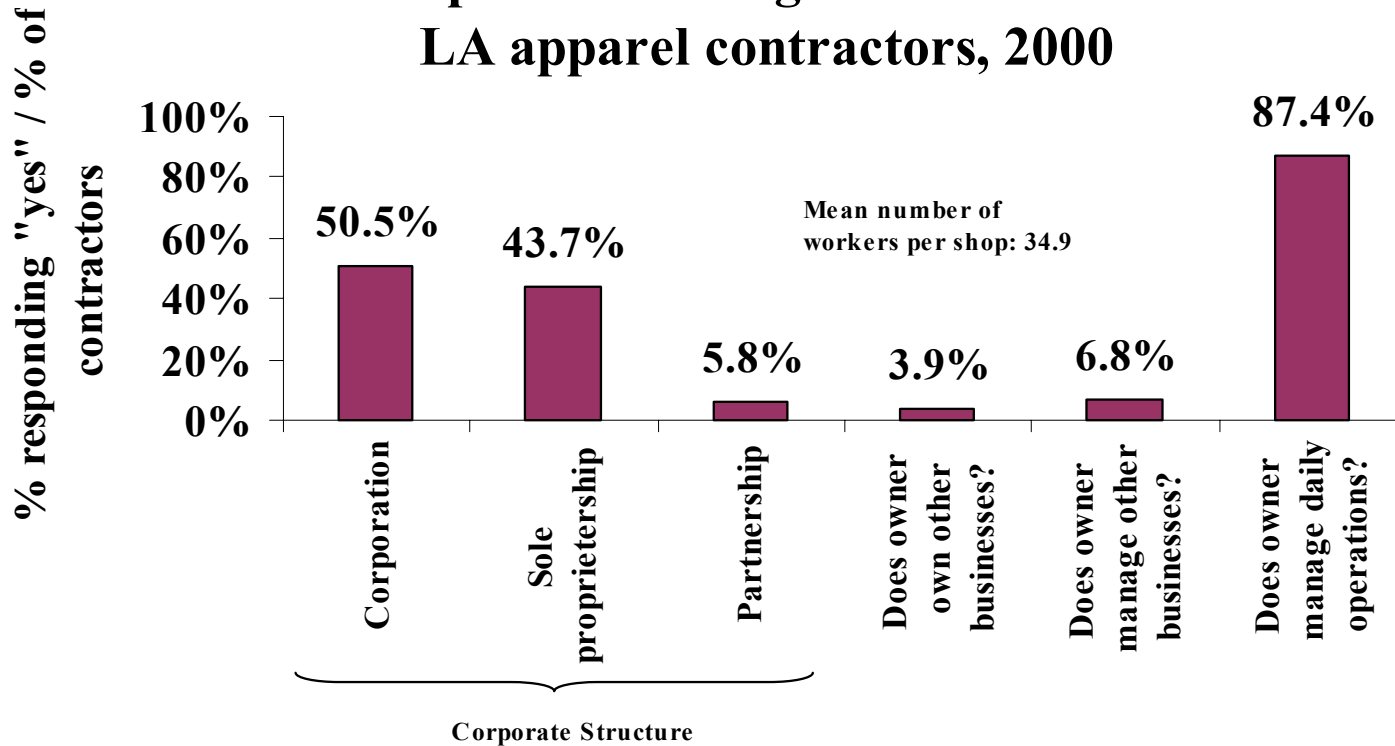
- Noncompliance will increase with:
  - Divergence between mandated wage and “market wage” (the lower the market wage relative to mandated, the higher the incentive not to comply)
  - Elasticity of product and labor demand
  - Probability of detection
  - Penalty for violation

## Months in operation LA apparel contractors, 2000



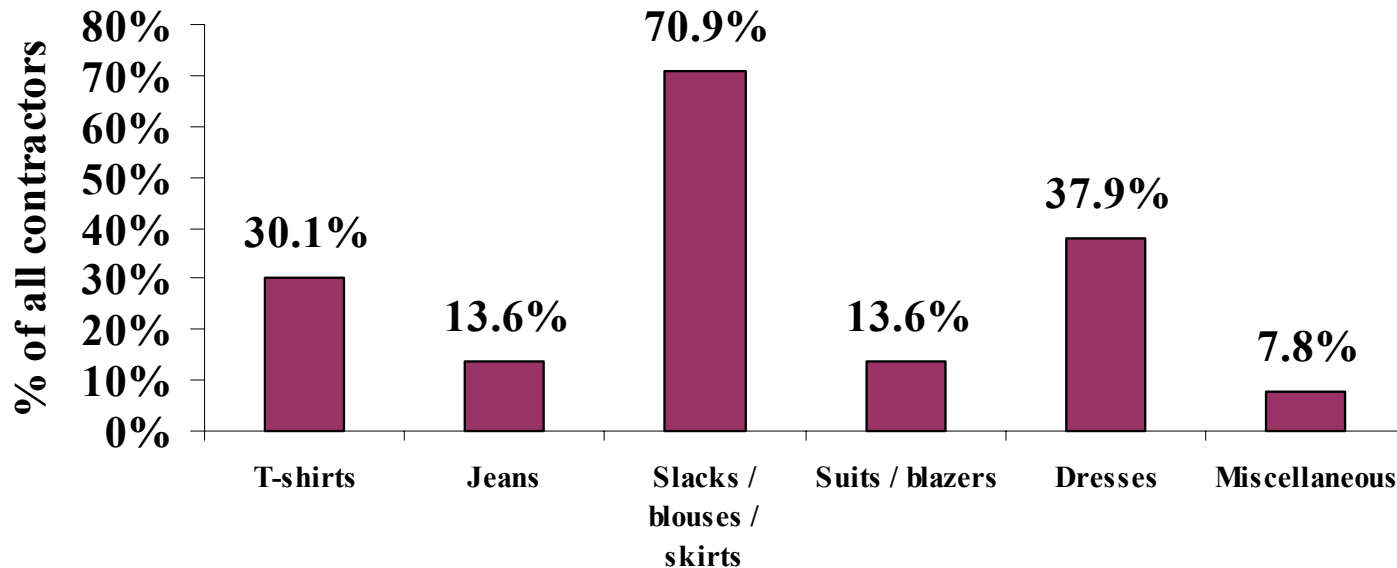
Source: WHD Survey of Southern California Contractors, 2000.

## Corporate / management structure LA apparel contractors, 2000



Source: WHD Survey of Southern California Contractors, 2000.

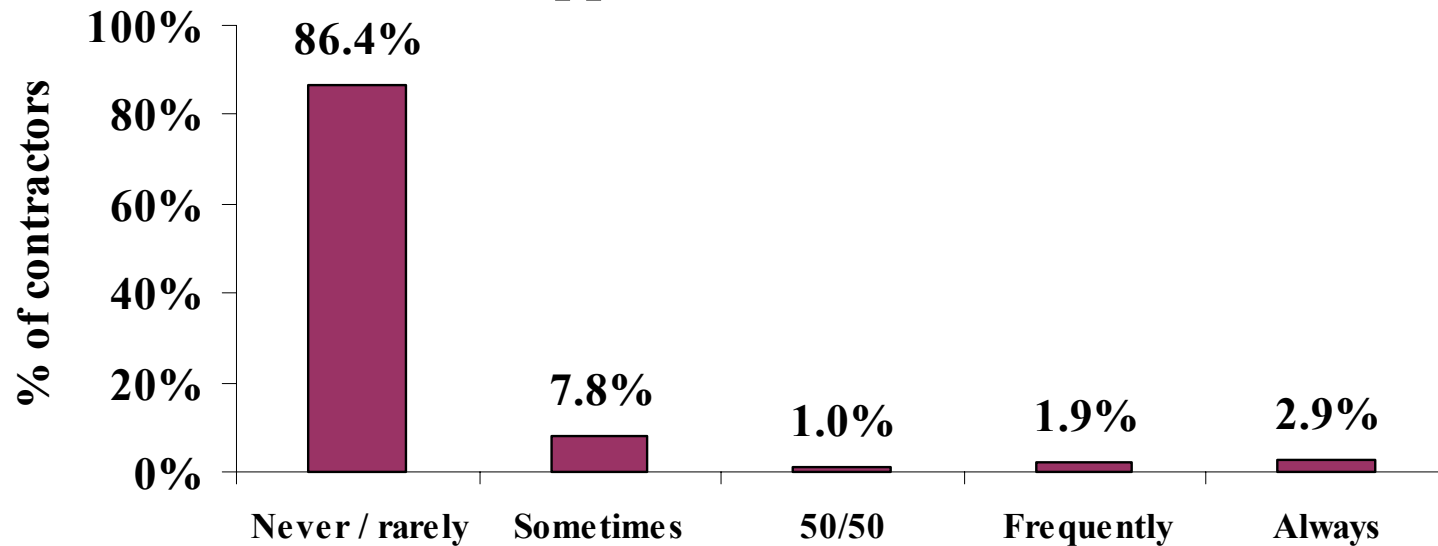
## Product categories produced\* LA apparel contractors, 2000



\*Note: Categories do not sum to 100% because contractor may produce multiple types of goods  
Source: WHD Survey of Southern California Contractors, 2000.

## If manufacturer changes due date, do you renegotiate cost?

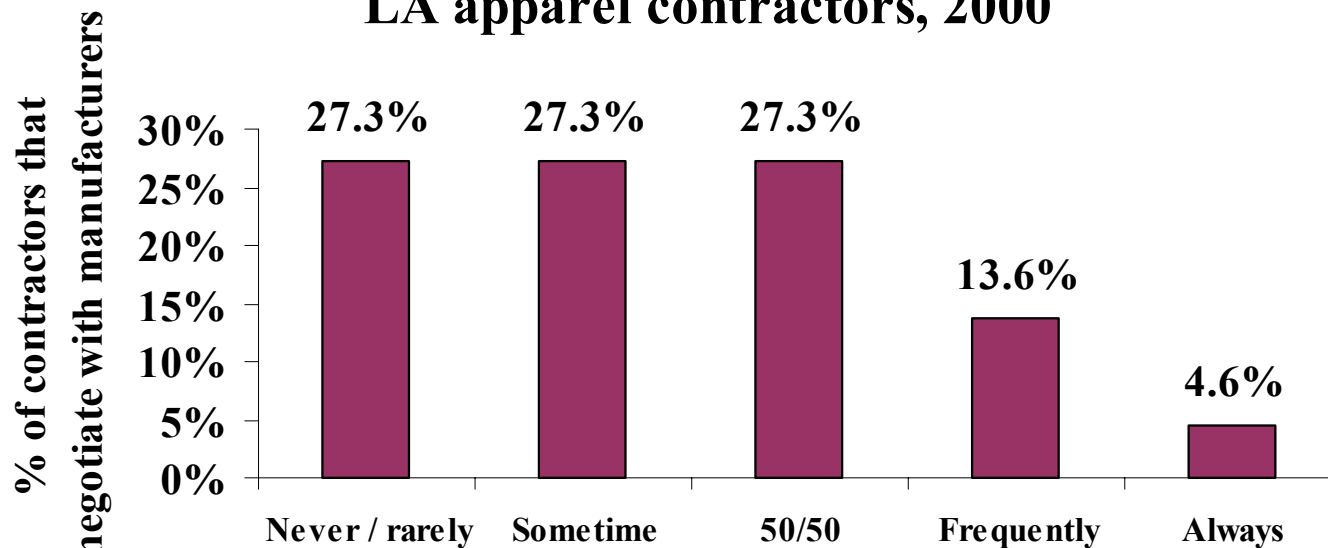
### LA apparel contractors, 2000



Source: WHD Survey of Southern California Contractors, 2000.

## How often does manufacturer change product price, given renegotiation?\*

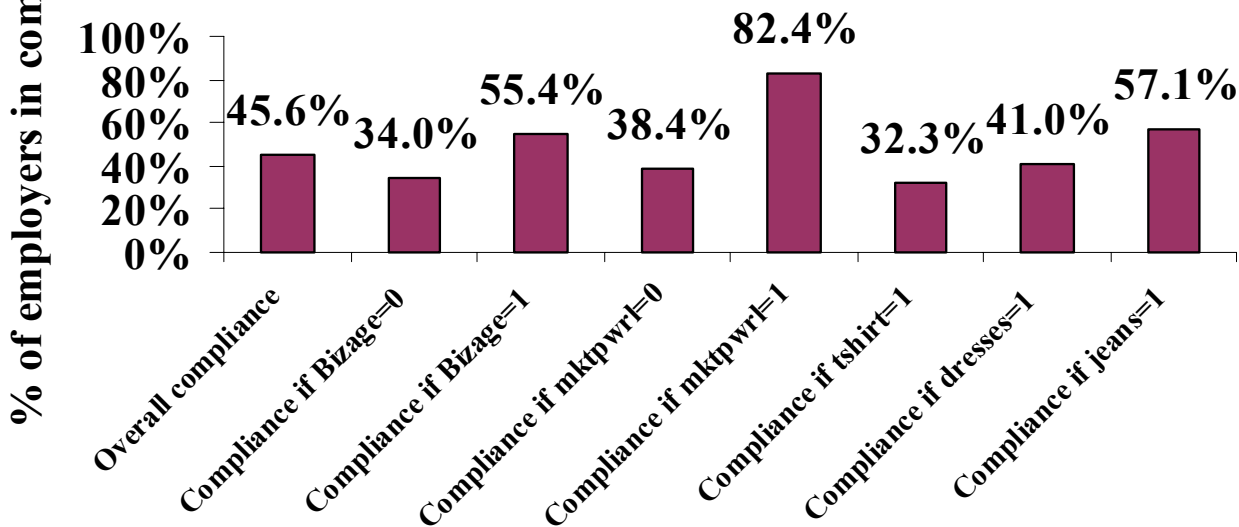
### LA apparel contractors, 2000



\*For those contractors who indicated that they renegotiate cost in the first place (n=22)

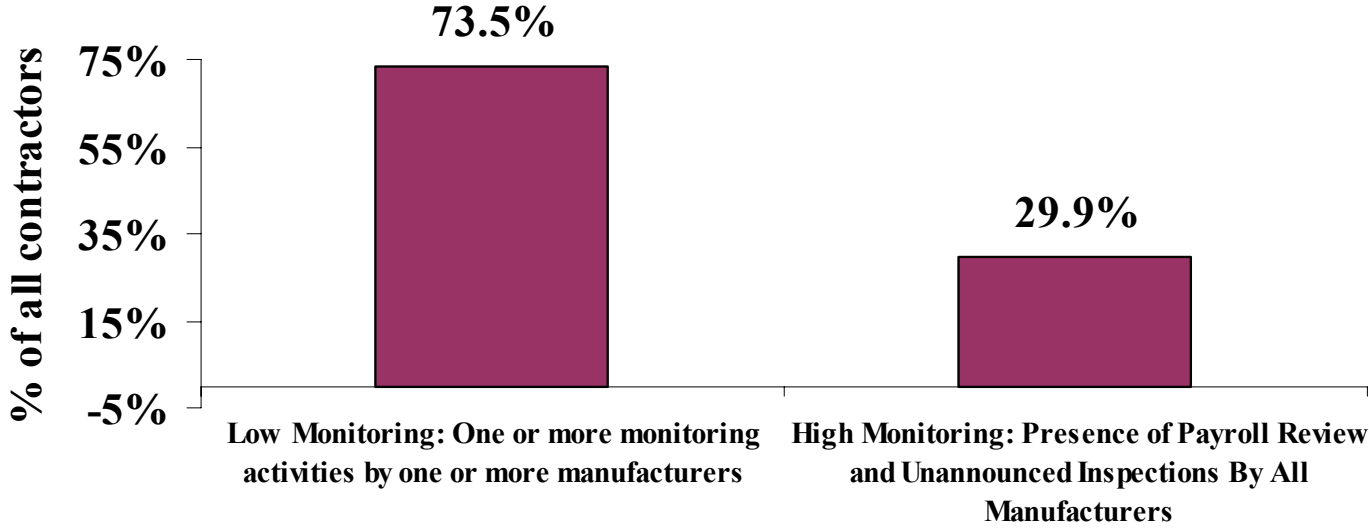
Source: WHD Survey of Southern California Contractors, 2000.

## **% employers in compliance by other characteristics LA apparel contractors, 2000**



Source: WHD Survey of Southern California Contractors, 2000.

# Types of monitoring arrangements LA apparel contractors, 2000



Source: WHD Survey of Southern California Contractors, 2000.

# Logit regressions of determinants of employer noncompliance with minimum wage standards, Los Angeles 2000 (Table 5)

	<i>Mean</i>	<i>Estimated logit Coefficients</i>	<i>Estimated dY/dX</i>
<i>Dependent (percent non-compliance among contractors)</i>	0.456	0.456	--
<b>Low monitoring</b>	<b>0.735</b>	<b>-1.50<sup>*</sup></b> <b>(0.84)</b>	<b>-.323</b>
<b>High monitoring</b>	<b>0.299</b>	<b>-1.28<sup>**</sup></b> <b>(0.60)</b>	<b>-.309</b>
Pricing power	.165	-1.80 <sup>**</sup> (0.83)	-.416
Ln(Size)	3.24	-0.29 (0.41)	-0.07
T-shirt	.30	1.16 <sup>*</sup> (0.66)	.261
Bizage	.521	-.63 (0.57)	-.151
Violator	.35	0.40 (0.62)	.096
Constant	--	2.91 <sup>**</sup> (1.18)	--
Prob > F	--	0.002	
F ratio (7, 89)	--	3.49	
N	97	97	

## Tobit estimates of determinants of compliance performance with minimum wage standards, Los Angeles 2000 (Table 6)

	<b>Marginal Effect: Conditional on being greater than zero</b>	
	<i>Minimum wage violations per 100 employees</i>	<i>Minimum wage back pay owed per worker per week</i>
Dependent mean and s.e. (weighted)		
<b>Low monitoring</b>	<b>-3.27</b> <b>(5.74)</b>	<b>-.559</b> <b>(1.92)</b>
<b>High monitoring</b>	<b>-16.87**</b> <b>(5.17)</b>	<b>-4.85**</b> <b>(1.52)</b>
Pricing power	-15.36** (4.86)	-3.81** (1.35)
Ln(Size)	-5.27 (3.36)	-1.06 (1.04)
T-shirt	8.96 (5.53)	1.94 (1.69)
Bizage	-5.64 (5.03)	-1.48 (1.70)
Violator	2.82 (5.25)	-1.12 (1.18)
Constant		
Prob > F	.000	.006
F ratio (7, 89)	5.74	3.09
N	97	97

## Tobit estimates of determinants of compliance performance, non-violators versus prior violators, Los Angeles 2000 (Table 7)

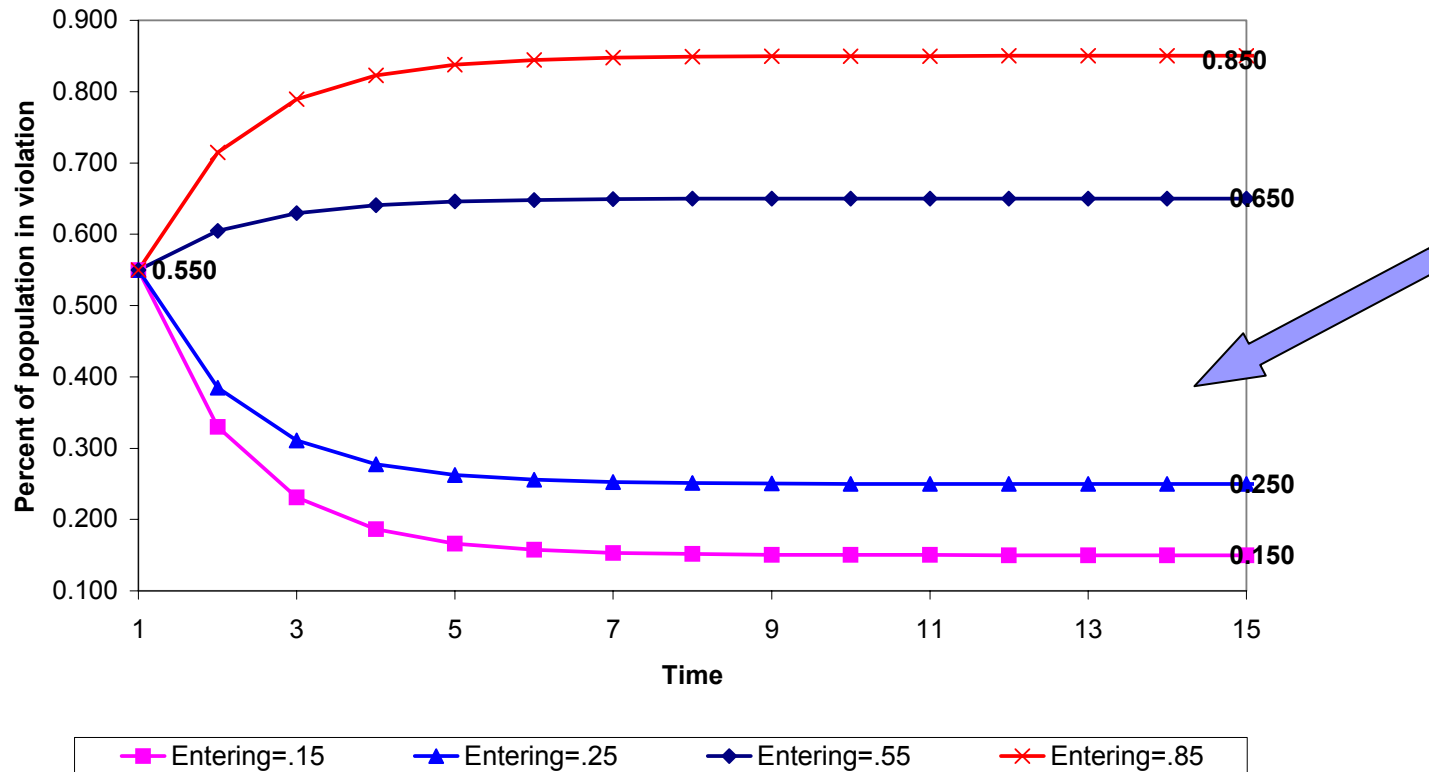
<i>Dependent</i>	<b>Marginal Effect: Conditional on being greater than zero</b>			
	Minimum wage Violations per 100 employees		Minimum wage back pay per worker per week	
	<i>Non violators</i>	<i>Violators</i>	<i>Non violator</i>	<i>Violator</i>
<b>Low monet</b>	<b>-8.86</b> <b>(6.71)</b>	<b>5.64</b> <b>(7.95)</b>	<b>-1.75</b> <b>(2.15)</b>	<b>1.52</b> <b>(1.19)</b>
<b>High monet</b>	<b>-15.63**</b> <b>(7.21)</b>	<b>-26.71**</b> <b>(9.87)</b>	<b>-5.19**</b> <b>(2.35)</b>	<b>-3.44**</b> <b>(1.45)</b>
Pricing power	-14.08 (13.45)	-19.81** (9.64)	-3.71 (4.33)	-2.53* (1.40)
Ln(Size)	-3.87 (3.61)	-5.32 (3.91)	-0.82 (1.16)	-0.33 (0.58)
Dresses	-8.90 (6.04)	-1.45 (6.69)	-1.81 (1.95)	-1.23 (1.00)
Bizage	-7.26 (6.28)	5.69 (7.13)	-1.84 (2.03)	-0.89 (1.02)
Constant	36.05** (11.40)	28.12* (15.26)	7.23** (3.65)	2.37 (2.29)
Prob > Chi <sup>2</sup>	0.0004	0.0031	0.0050	0.0213
Pseudo R <sup>2</sup>	0.0585	0.0819	0.0541	0.0897
Log likelihood	-194.483	-110.514	-162.064	-75.472
N	62	35	62	35

## Tobit estimates of determinants of compliance performance, new versus old contractors, Los Angeles 2000 (Table 8)

<i>Dependent</i>	<b>Marginal Effect: Conditional on being greater than zero</b>			
	Minimum wage Violations per 100 employees		Minimum wage back pay per worker per week	
	<i>New contractors</i>	<i>Old contractors</i>	<i>New contractors</i>	<i>Old contractors</i>
<b>Low monet</b>	<b>-3.17</b> <b>(9.54)</b>	<b>-26.10**</b> <b>(10.91)</b>	<b>0.99</b> <b>(3.14)</b>	<b>-12.08**</b> <b>(2.59)</b>
<b>High monet</b>	<b>-22.30*</b> <b>(11.69)</b>	<b>-1.20</b> <b>(9.50)</b>	<b>-5.80</b> <b>(3.84)</b>	<b>-0.28</b> <b>(2.22)</b>
Pricing power	dropped (all zeros)	-17.05 (13.29)	a	-5.36* (3.33)
Ln(Size)	-6.66 (5.66)	-0.15 (5.54)	-2.37 (1.87)	1.44 (1.35)
Dresses	-18.37* (10.19)	2.61 (7.97)	-4.95 (3.35)	1.46 (1.82)
Constant	51.83** (19.38)	15.70 (12.20)	12.24** (6.36)	1.50 (2.88)
Prob > Chi <sup>2</sup>	0.0172	0.0402	0.0879	0.0037
Pseudo R <sup>2</sup>	0.0447	0.0802	0.0367	0.1490
Log likelihood	-128.355	-66.668	-106.417	-49.862
N	33	29	33	29

# Predicted level of regulatory performance given different violation rates among entering contractors

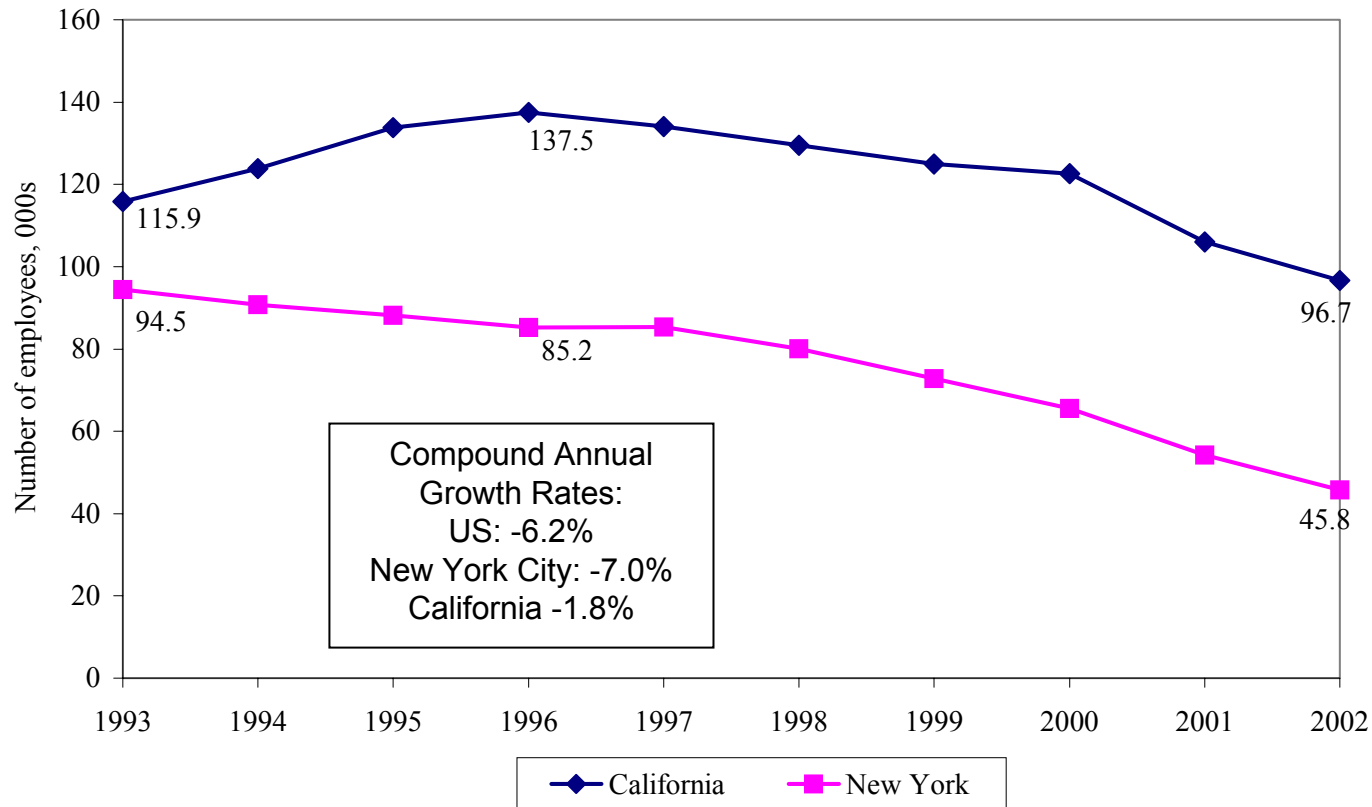
Predicted percent of contractors in violation over time:  
Differing violation levels of entrants



Based on a model where percent of violators are set at the following levels: Beginning level = 55%; exiting contractors = 55%. Violation rates of entering contractors set at different levels as shown in above table; 65% turnover of contractors per period.

# Apparel industry employment in California, New York, 1993-2002

Employment in apparel:  
New York vs. California, 1993-2002



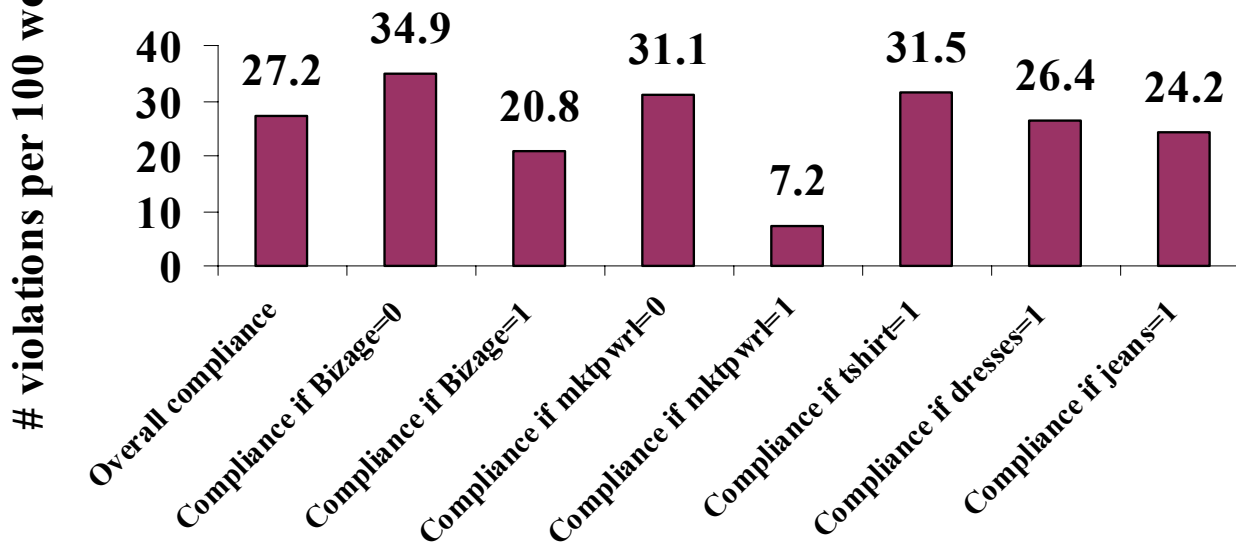
# Conclusions / Implications

- Recent DOL-WHD initiatives show evidence of considerable impact by using supply chain pressures;
- Larger scale changes in industry supply chains occurring go far beyond apparel;
- Supply chain structure has parallels with other hard to regulate, low wage industries;
- International analogs have both promise and inherent limitations.

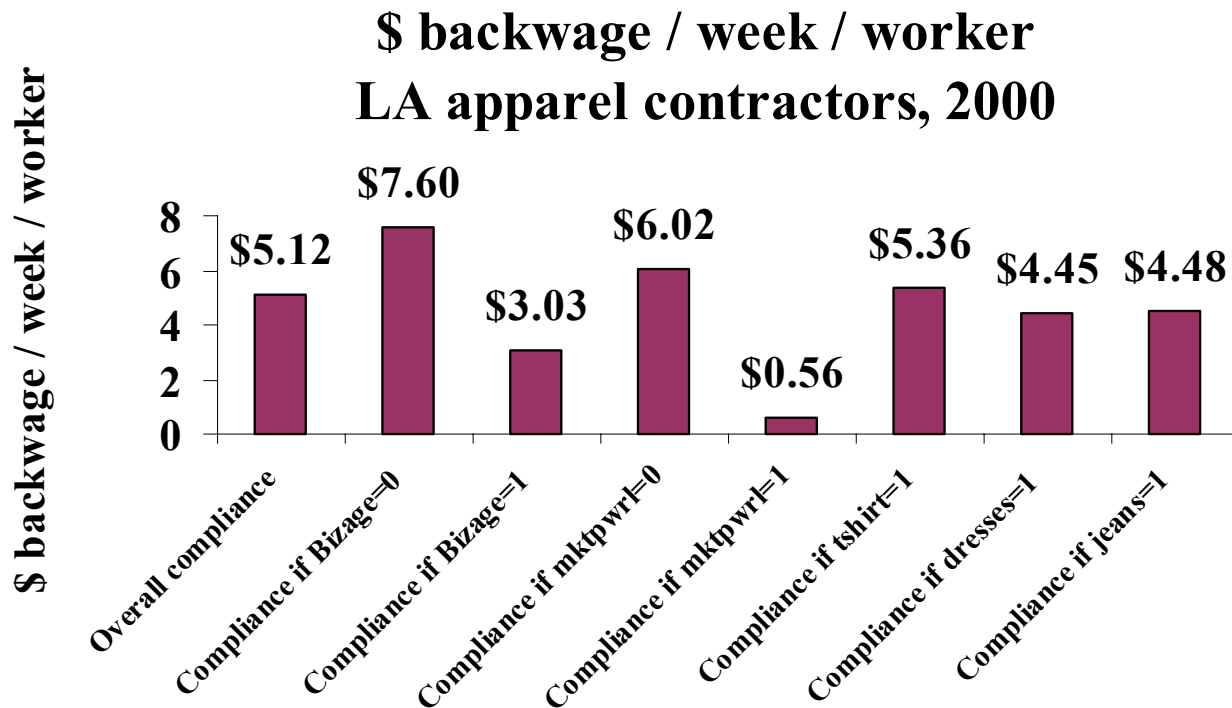




## # violations per 100 employees by other characteristics LA apparel contractors, 2000



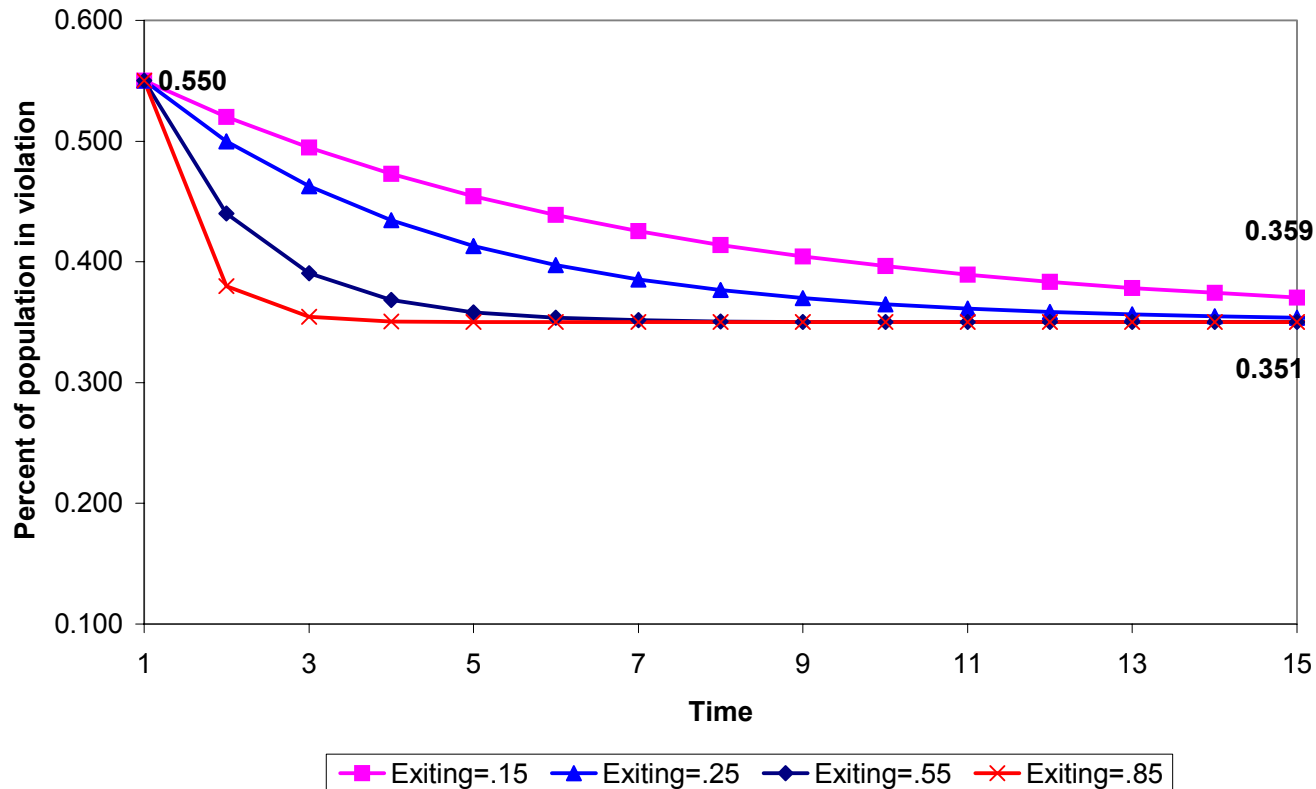
Source: WHD Survey of Southern California Contractors, 2000.



Source: WHD Survey of Southern California Contractors, 2000.

# Predicted level of regulatory performance given different violation rates among exiting contractors

Predicted percent of contractors in violation over time:  
Differing violation levels of exiting contractors



Based on a model where percent of violators are set at the following levels: Beginning level = 55%; entering contractors = 35%. Violation rates of exiting contractors set at different levels as shown in above table; 65% turnover of contractors per period.