

AN ANALYSIS of INTERSECTORAL LABOR MARKET TRANSITIONS in TURKEY

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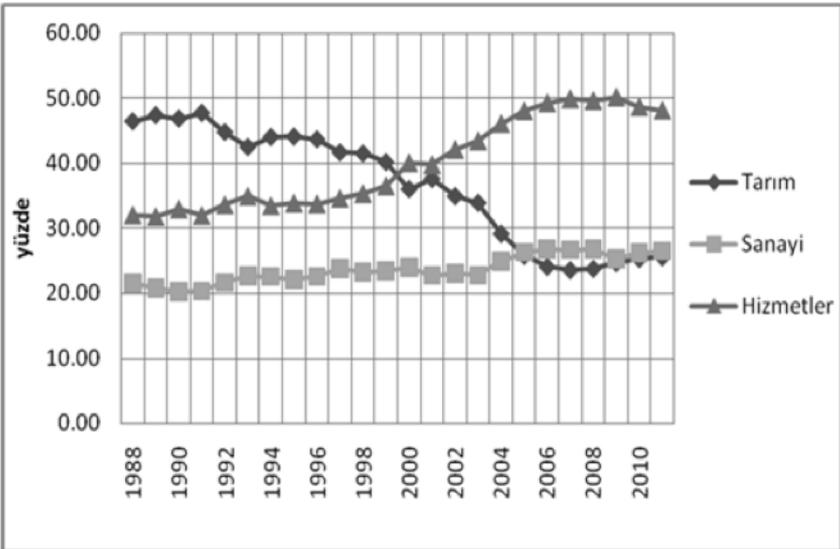
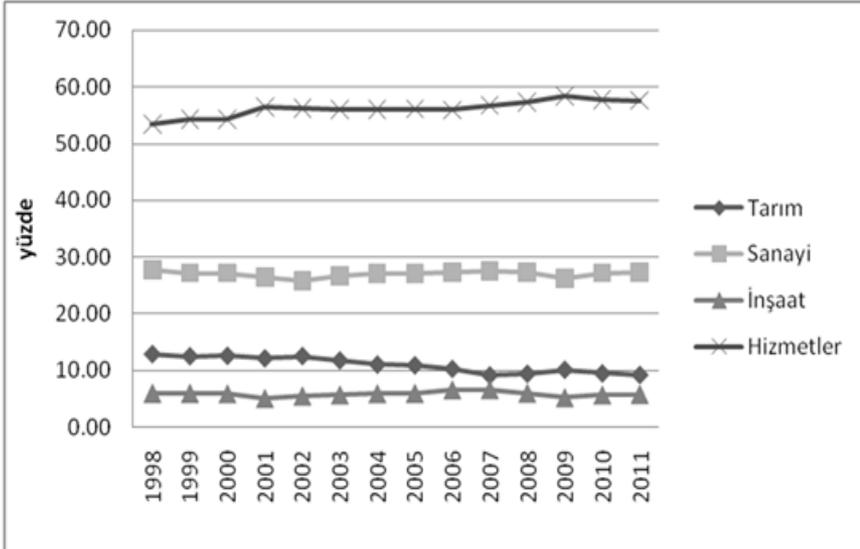
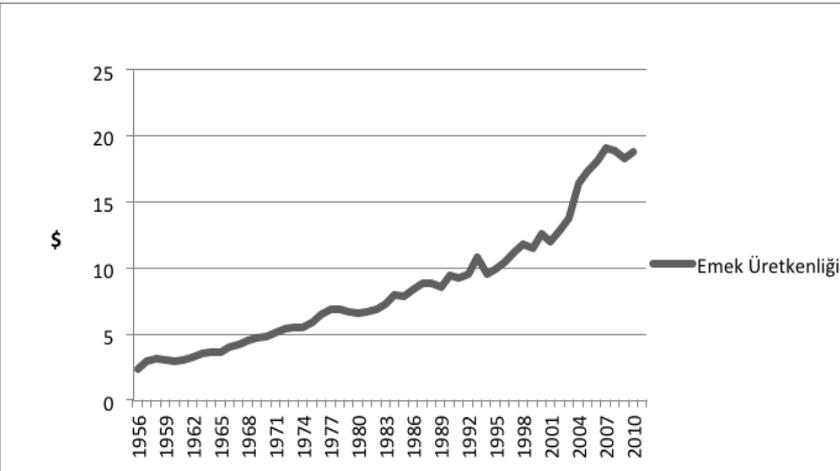
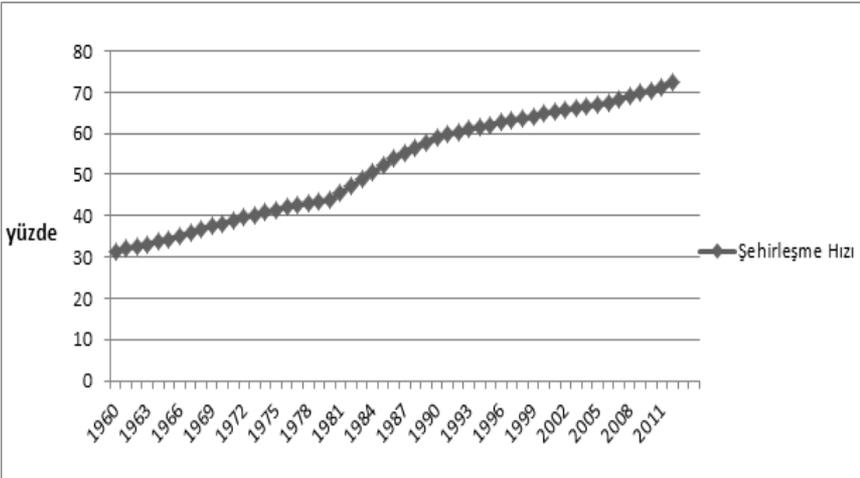
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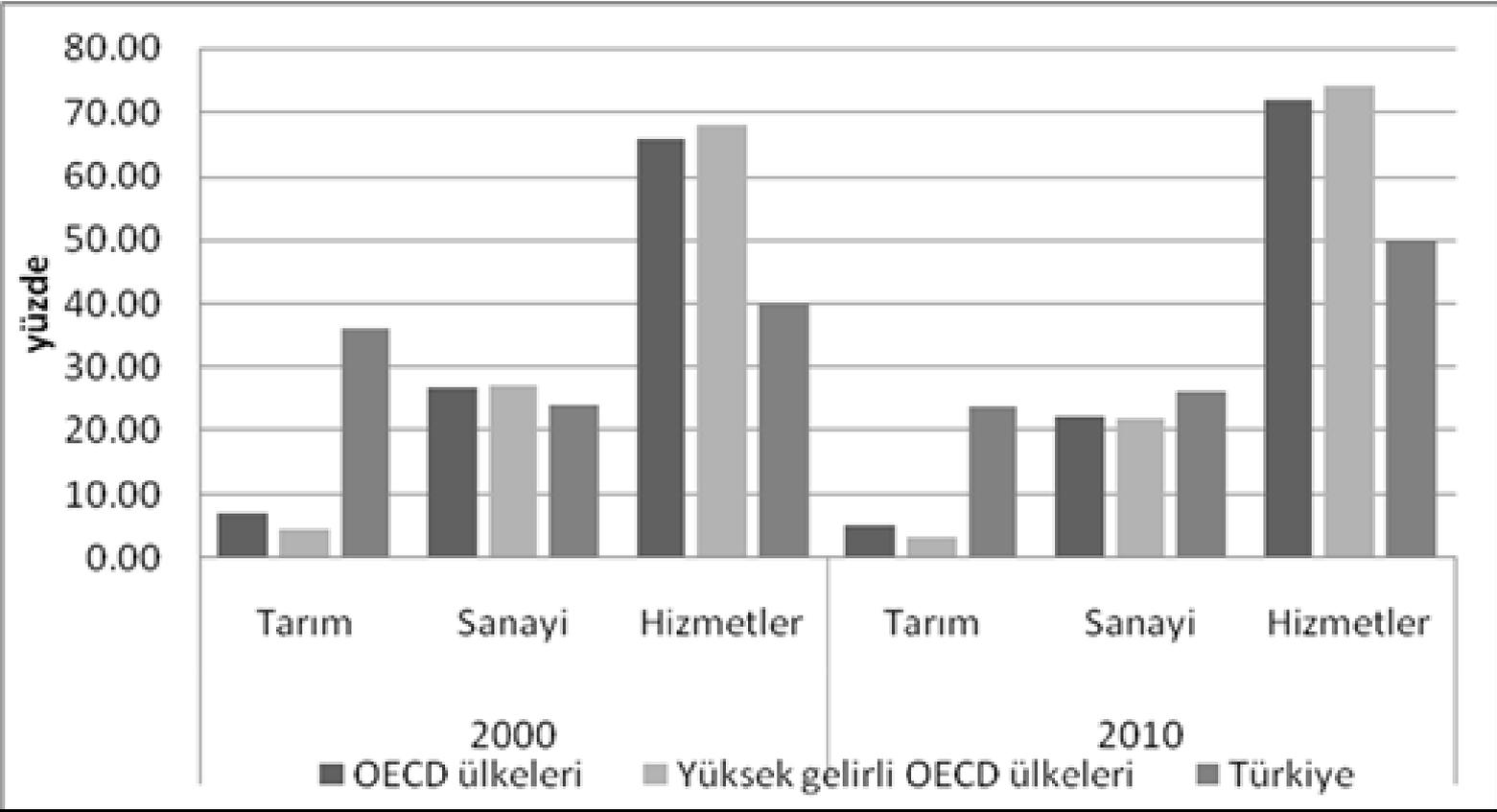
Introduction

- Turkish economy witnessed a substantial structural change in the last 30 years.
- Employment shifted from low to high productivity activities, the share of agricultural employment more than halved, and that of industry and services have recorded significant rises.
- This study aims to explore the intersectoral dynamics of the Turkish labor market using the Income and Living Conditions Survey.
 - analyze the labor mobility patterns across five different labor market states (agriculture, industry, services, unemployment and inactivity) for male and female workers.
 - apply a Markov Transition Model to identify the direction and magnitude of labor mobility across different labor market states.
 - estimate Multinomial Logit models using individual, household and employment characteristics as explanatory variables.

Background of the structural change



Background of the structural change in Turkey



Data

- Income and Living Conditions Survey (ILIC) of the Turkish Statistical Institute (TurkStat)
- Novel, rich and nationally representative data covering detailed information
- We consider five labor market states as:
 - **Agriculture (A)**: Agriculture, forestry or fishery
 - **Industry (I)**: Mining, manufacturing, utilities, construction
 - **Services (S)**: All others
 - **Unemployed (U)**: Not working, but actively searching for a job
 - **Inactive (N)**: Neither working nor searching for a job

Data

	2006		2007		2008		2009		2010	
	N	%	N	%	N	%	N	%	N	%
Agriculture (A)	1,481	17.25	1,431	16.16	1,382	15.07	1,530	17.19	1,469	16.5
Industry (I)	1,717	20	1,914	21.62	2,035	22.19	1,796	20.18	1,921	21.58
Services (S)	2,878	33.53	3,105	35.07	3,351	36.54	2,841	31.91	2,815	31.62
Unemployed(U)	553	6.44	459	5.18	514	5.6	693	7.78	571	6.41
Inactive (N)	1,955	22.77	1,944	21.96	1,889	20.6	2,042	22.94	2,126	23.88
Toplam	8,584	100	8,853	100	9,171	100	8,902	100	8,902	100

	2006		2007		2008		2009		2010	
	N	%	N	%	N	%	N	%	N	%
Agriculture (A)	1,760	18.09	1,780	17.93	1,617	15.94	1,736	17.5	1,666	16.79
Industry (I)	333	3.42	350	3.53	406	4	372	3.75	396	3.99
Services (S)	708	7.28	857	8.63	954	9.41	658	6.63	611	6.16
Unemployed(U)	182	1.87	146	1.47	231	2.28	299	3.01	253	2.55
Inactive (N)	6,746	69.34	6,794	68.44	6,934	68.37	6,857	69.11	6,996	70.51
Toplam	9,729	100	9,927	100	10,142	100	9,922	100	9,922	100

- Markov Transition Analysis

- A random process X_t defined over $K=\{1, \dots, K-1\}$ is a 1st-order Markov chain if

$$\Pr (X_t=k \mid X_{t-1}, \dots, X_1) = \Pr (X_t=k \mid X_{t-1})$$

- If X_t is a Markov-chain and $j, k \in \{K\}$, the conditional probability

$$p_{kj}(t, t+1) = \Pr (X_{t+1}=j \mid X_t=k) \text{ for } \forall t \text{ and } j, k \in K$$

- Markov chain is time-homogenous if

$$p_{kj}(t, t+n) = \Pr (X_{t+n}=j \mid X_t=k) \text{ for } \forall t, n \text{ and } j, k \in K$$

- Given a finite set of states, $K=\{1, \dots, K-1\}$

$$P = \begin{bmatrix} p_{00} & \cdots & p_{0K} \\ \vdots & \ddots & \vdots \\ p_{K0} & \cdots & p_{KK} \end{bmatrix}$$

- P matrix can be estimated by the maximum likelihood estimator

$$p_{kj} = N_{kj} / N_k.$$

- X_t : LM state of a given individual at time t and $K=\{A, I, S, U, N\}$

- Multinomial Logit Regression Analysis

- MNL enable predicting the probability of each possible transition as a function of individual characteristics

- A simple MNL model specifies:

$$\Pr (X_{i,t+n} = j | X_{i,t} = k) = \frac{\exp(Z_i' \beta_{j|k})}{\sum_{l=0}^K \exp(Z_i' \beta_{l|k})}$$

- Z_i are case-specific regressors for each individual i ; $X_{it} \in K = \{0, 1, \dots, K\}$ is the labor market state of i at time t

- Marginal effects are computed as

$$\frac{\partial \Pr (X_i = j)}{\partial z_m} = \Pr (X_i = j | Z) \cdot \left[\beta_m^j - \sum_{l=0}^K \beta_m^l \Pr (X_i = l | Z) \right]$$

- The marginal effects depict “how the given explanatory variables influence the probability of leaving the initial state for a certain destination state relative to the probability of no outflow” (Bukowski, 2005).

Transition Analysis Main Findings

LMS 2006	LMS 2007						LMS 2007	LMS 2008					
	A	I	S	U	N	Toplam		A	I	S	U	N	Toplam
A	2713	55	65	38	370	3241	A	2705	68	61	33	344	3211
	83.71	1.7	2.01	1.17	11.42	100		84.24	2.12	1.9	1.03	10.71	100
I	43	1645	97	95	170	2050	I	46	1778	171	123	146	2264
	2.1	80.24	4.73	4.63	8.29	100		2.03	78.53	7.55	5.43	6.45	100
S	50	99	3081	118	238	3586	S	46	165	3391	119	241	3962
	1.39	2.76	85.92	3.29	6.64	100		1.16	4.16	85.59	3	6.08	100
U	44	138	179	151	223	735	U	30	99	155	144	177	605
	5.99	18.78	24.35	20.54	30.34	100		4.96	16.36	25.62	23.8	29.26	100
N	469	199	354	196	7483	8701	N	290	189	302	242	7697	8738
	5.39	2.29	4.07	2.25	86	100		3.32	2.16	3.66	2.77	88.09	100
Toplam	3319	2136	3776	598	8484	18313	Toplam	3117	2299	4098	661	8605	18780
	18.12	11.66	22.62	3.27	46.33	100		16.6	12.24	21.82	3.52	45.82	100
LMS 2008	LMS 2009						LMS 2009	LMS 2010					
	A	I	S	U	N	Toplam		A	I	S	U	N	Toplam
A	2632	35	44	41	247	2999	A	2834	52	48	34	298	3266
	87.76	1.17	1.47	1.37	8.24	100		86.77	1.59	1.47	1.04	9.12	100
I	74	1803	148	232	184	2441	I	23	1784	80	131	150	2168
	3.03	73.86	6.06	9.5	7.54	100		1.06	82.29	3.69	6.04	6.92	100
S	57	90	3757	169	232	4305	S	36	119	2930	152	262	3499
	1.32	2.09	87.27	3.93	5.39	100		1.03	3.4	83.74	4.34	7.49	100
U	42	108	154	224	217	745	U	37	189	184	280	302	992
	5.64	14.5	20.67	30.07	29.13	100		3.73	19.05	18.55	28.23	30.44	100
N	272	154	296	303	7798	8823	N	205	173	184	227	8110	8899
	3.08	1.75	3.35	3.43	88.38	100		2.3	1.94	2.07	2.55	91.13	100
Toplam	3077	2190	4399	969	8678	19313	Toplam	3135	2317	3426	824	9122	18824
	15.93	11.34	22.78	5.02	44.93	100		16.65	12.31	18.2	4.38	48.46	100

Transition Analysis Main Findings

- Transitions from A to I and S are minimal, mostly into N. Relative rise in share after 2006 due to crisis and increasing global food prices.
- I is the mostly affected sector from the crisis. At the same time, most welcoming sector in the aftermath in response to the employment promotion measures taken by the govt.
- Transitions into S are higher than that out for all years. The most attractive sector out of unemployment. Due to the high demand and relatively low skill requirements.

Multinomial Logit Analysis Main Findings

- *Transitions from Agriculture*

- 25-44 aged men are less likely to move into I, U and N states compared to remaining in A than 15-24 aged men. Similar results hold for women.
 - Young labor has a higher chance of transiting from A to I.
 - Young labor is more mobile in rural to urban flows.
 - Young labor has a higher demand in I given productivity and trainability advantages.
 - Middle aged and elderly are more settled and have dependents, limiting their mobility.
- 45-64 aged women are less likely to move into S compared to 15-24 aged women.
 - Younger women are the ones to exit A, and typically move into S where high skills is not required.
- Household characteristics are not statistically significant for men. For women, being married is negatively associated with all transitions out of A.
 - Married women in the traditional Turkish family structure work as unpaid workers in family farms, thus less likely to perform intersectoral transitions.
- Household size is statistically significantly negative for all transitions out of A for both men and women.
 - Crowded families are very common in unpaid family work in agriculture.
- The crisis reduced the probability of AI and AS transitions. Women are less likely to move into inactivity in the crisis period.

- *Transitions from Industry*

- Young men significantly more mobile compared to middle-aged and elderly.
- For both men and women, probability of leaving the workforce is lower for the middle aged workers.
- Middle aged women are less likely than young women to become unemployed.
- Elderly men are significantly less more to become inactive compared to young men, for women this relation is insignificant.
 - Early retirement schemes
 - Could be due to the widespread informality among women
- Education is negatively related to IA transitions for men, yet not statistically significant for IS transitions. Similar patterns are observed for women.
- Education significantly reduces the probability of moving into U and N for both men and women.
 - Confirm the theories of education's importance.
- Marriage significantly reduces the probability of IU and IN transitions for men, and all transitions out of I for women except that into inactivity. .
- For both men and women, firms size is statistically negatively associated with probability of transitions out of I to all other labor market states.

- *Transitions from Services*

- Middle aged and elderly are less likely to move out of services into other sectors compared to the young workers for both men and particularly women.
- The probability of moving into all other sectors is statistically significantly negatively associated with experience for men. For women, it is insignificant.
- As education increases, probability of intersectoral mobility significantly decreases.
- Household demographics display similar patterns to that of the Industry sector.
- The crisis does not have a significant effect on transitions into unemployment for the Services sector workers. Whereas, the probability of SN transitions decreases.

Concluding Remarks

- Transitions from A to I and S are minimal, mostly into N. Relative rise in share after 2006 due to crisis and increasing global food prices.
- I is the mostly affected sector from the crisis. At the same time, most welcoming sector in the aftermath in response to the employment promotion measures taken by the govt.
- Transitions into S are higher than that out for all years. The most attractive sector out of unemployment. Due to the high demand and relatively low skill requirements.

- *Age effect:*
 - 15-24 aged are the most mobile group in all transitions, particularly A.
 - Even is the share of A is relatively high, its potential for promoting growth through shifting labor into higher productivity sectors has narrowed.
- *Education effect:*
 - Education and intersectoral mobility display a statistically significant negative relationship, confirming its role in labor mobility in Turkey.
 - The higher the education levels is, the less attractive A becomes.
- *Household characteristics effect:*
 - For men, no significant effect of marriage, household head status on intersectoral mobility, but only for transitions into inactivity.
 - Household size has a negative effect on the probability of transitions.
- *Firm size effect:*
 - Negative effects on the probability of intersectoral mobility for both men and women.

Thank you

	Male				Female				
	AI	AS	AU	AN		AI	AS	AU	AN
A25-44	-0.420* (-2.23)	-0.393 (-1.95)	-0.00877 (-0.04)	-0.912*** (-3.99)	A25-44	-0.713* (-2.10)	-0.28 (-1.07)	-0.648 (-1.82)	-0.193** (-2.92)
A45-64	-0.0289 (-0.10)	-0.436 (-1.37)	-0.320 (-0.73)	0.561 (1.91)	A45-64	-0.235 (-0.36)	-1.461* (-2.08)	-0.75 (-0.62)	0.146 (1.03)
Exp	-0.110*** (-5.92)	-0.0802*** (-4.38)	-0.185*** (-7.17)	-0.153*** (-8.22)	Exp	-0.201*** (-4.12)	-0.186*** (-6.82)	-0.199*** (-4.59)	-0.123*** (-12.59)
Exp2	0.000654 (1.46)	0.000658 (1.89)	0.00246*** (4.66)	0.00232*** (6.96)	Exp2	0.00250* (2.08)	0.00326*** (4.44)	0.00324*** (3.4)	0.00209*** (9.99)
Noed	-0.198 (-1.03)	-0.664** (-3.18)	0.213 (0.90)	0.572*** (3.84)	Noed	-1.522*** (-3.41)	-2.004*** (-4.47)	-1.359* (-2.16)	0.122 (1.68)
Secon	-0.370* (-2.36)	-0.624*** (-3.56)	-1.200*** (-4.36)	-0.770*** (-3.99)	Secon	-1.362*** (-3.44)	-1.582*** (-4.37)	-1.571* (-2.54)	-0.948*** (-6.91)
High	-0.557** (-2.99)	-0.430* (-2.51)	-1.031*** (-3.44)	-1.105*** (-3.88)	High	-0.681 (-1.13)	0.234 (0.64)	-0.485 (-0.62)	-0.235 (-1.25)
Univ	-0.330 (-0.59)	0.710* (2.36)	-0.299 (-0.41)	0.485 (1.07)	Univ	-27.84*** (-49.32)	1.262 (1.42)	2.325 (1.88)	-0.705 (-0.68)
Marr	0.0645 (0.37)	-0.285 (-1.62)	-0.452 (-1.88)	-0.305 (-1.55)	Marr	-1.576*** (-4.50)	-0.659** (-2.94)	-1.836*** (-4.00)	-0.577*** (-6.46)
Child	-0.0561 (-0.38)	-0.574*** (-4.54)	-0.216 (-1.07)	-0.254 (-1.92)	Child	0.0289 (0.1)	-0.324 (-1.28)	-0.613 (-1.34)	-0.0165 (-0.19)
Hhead	-0.256 (-1.42)	0.180 (1.04)	0.0391 (0.15)	-0.314 (-1.31)	Hhead	-0.468 (-0.60)	0.794 (1.95)	0.406 (0.62)	-0.113 (-0.69)
Hsize	-0.178*** (-7.54)	-0.121*** (-5.61)	-0.171*** (-5.59)	-0.118*** (-4.84)	Hsize	-0.340*** (-5.14)	-0.292*** (-6.77)	-0.357*** (-4.26)	-0.0839*** (-7.65)
Medi	2.346*** (13.08)	1.497*** (7.00)	1.501*** (4.85)	1.080*** (3.87)	Medi	1.119* (1.99)	1.650*** (4.64)	1.135 (1.62)	0.782*** (5.03)
Large	3.636*** (14.98)	3.039*** (11.22)	0.514 (0.51)	-27.81*** (-123.23)	Large	6.585*** (8.25)	4.011*** (4.61)	4.643*** (3.52)	-27.98*** (-46.26)
2007-08	-0.0909 (-0.70)	-0.454*** (-3.33)	-0.589* (-2.57)	-0.520*** (-3.47)	2007-08	-0.0596 (-0.17)	-0.296 (-1.27)	-0.834 (-1.57)	-0.204* (-2.44)
2008-09	-1.030*** (-6.12)	-0.812*** (-5.39)	-0.496* (-2.23)	-0.792*** (-4.85)	2008-09	-0.107 (-0.30)	-0.985** (-2.97)	0.231 (0.58)	-0.514*** (-5.60)
2009-10	-0.634*** (-4.32)	-0.798*** (-5.64)	-0.610** (-2.73)	-0.578*** (-3.81)	2009-10	-1.321* (-2.23)	-0.694* (-2.23)	-1.056 (-1.79)	-0.385*** (-4.36)