Labor Market Distortion and Price Deviation:

Static Analysis on China's Economy within a General Equilibrium Framework

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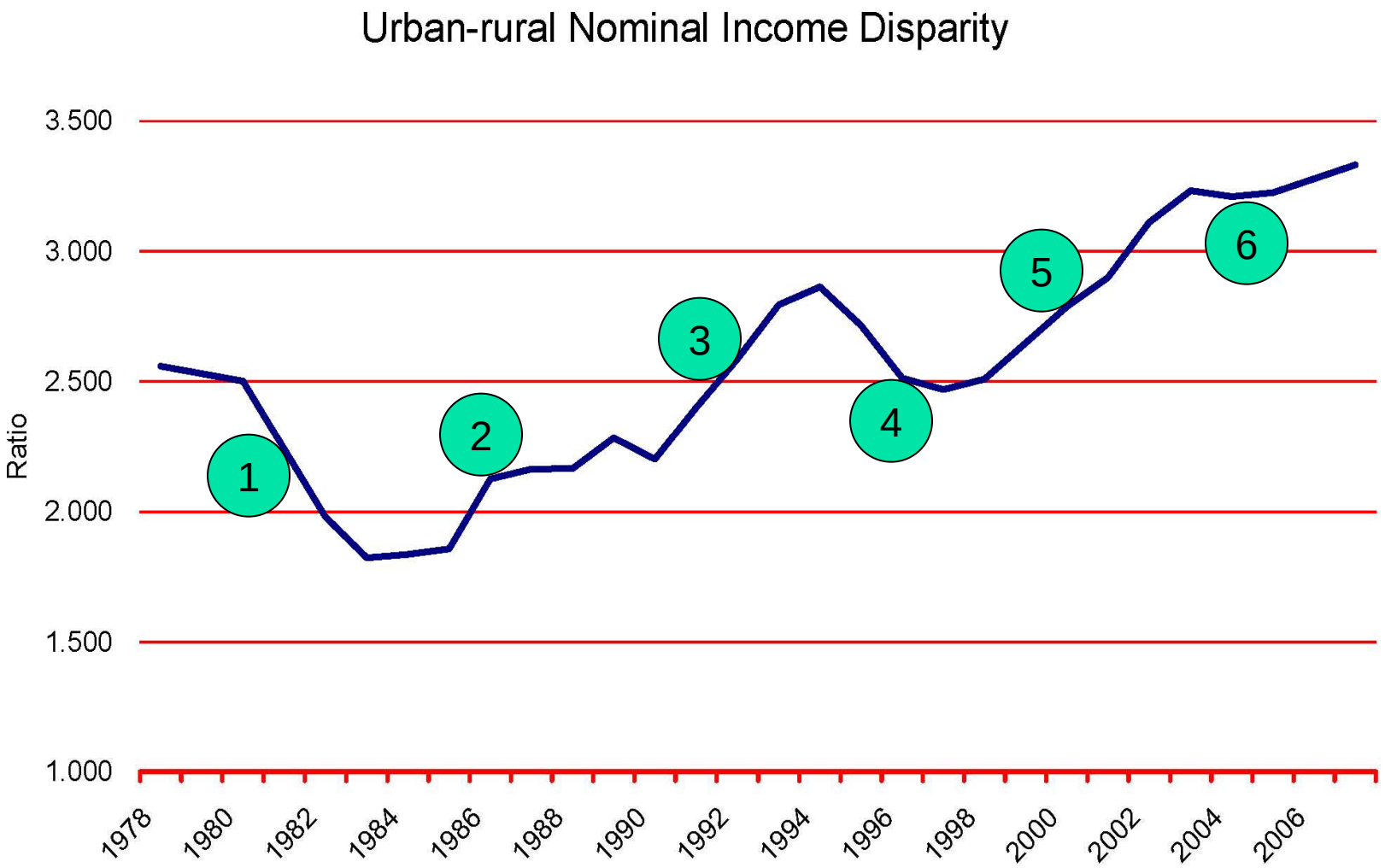
Key Words

- Urban-Rural Disparity
- Labor Market Distortion
- Price Deviation
- General Equilibrium


Urban-rural Nominal Income Disparity
Ratio
3.500
3.000
2.500
2.000
1.500
1.000
1
2
3
4
5
6
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006

Six Main Periods

- 1. Reform in Agricultural Sectors
- 2. Market Reform
- 3. Reform in Urban Areas (Violent Inflation)
- 4. Inflation was Under Control
- 5. After the Asian Financial Crisis
- 6. Industry Conversely Nurturing Agriculture

- 1979~1983, **Converging**
- 1984~2003, Long-term Significant **Exacerbation**
- 2004~Now, **Mitigation** to Some Extent

Dual Economy

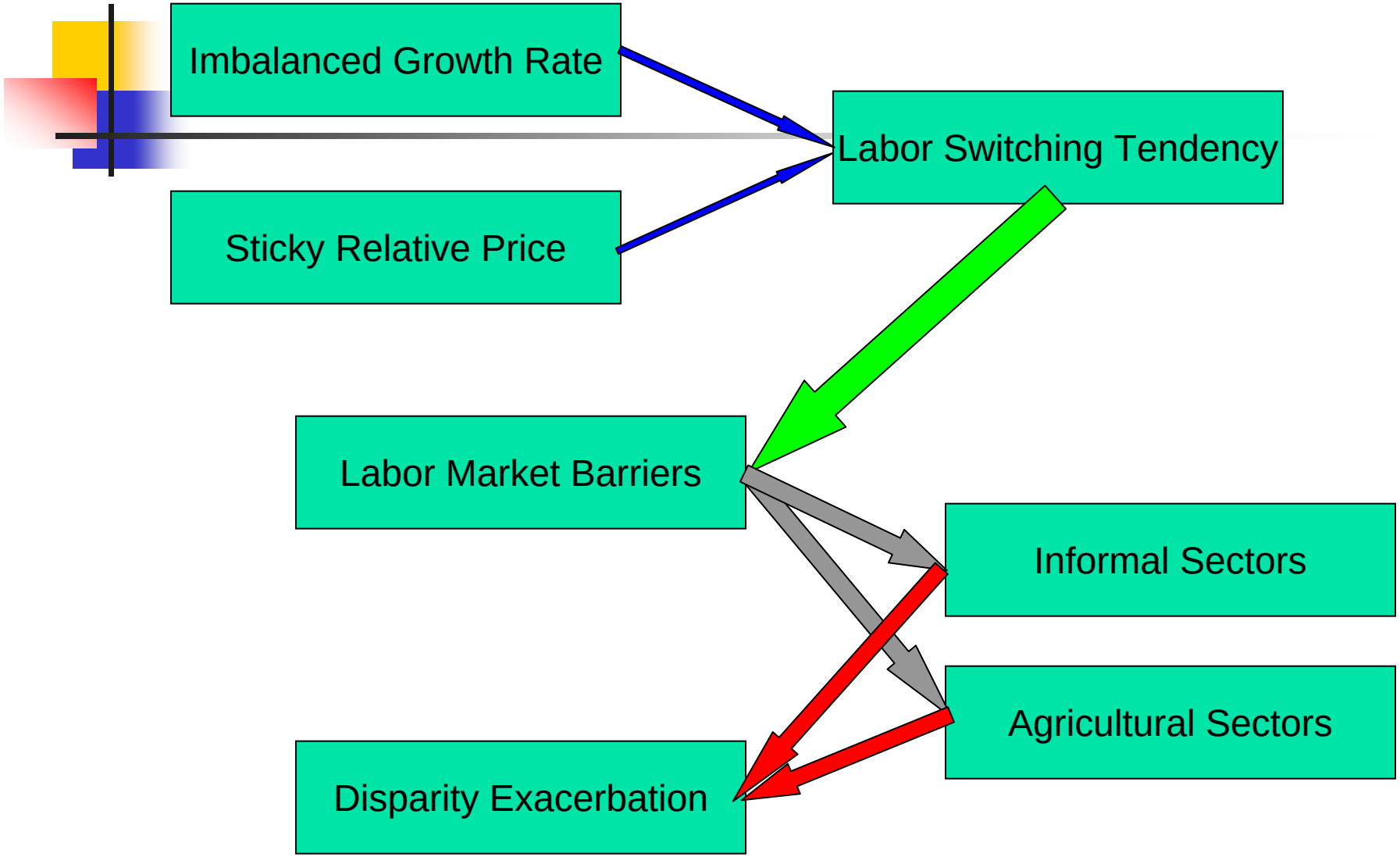
- According to the Lewis-Ranis-Fei model, dual economy is endogenous.
- Urban-rural inequality in developing countries is a familiar step in the process of industrialization, which is determined by the market power automatically.
- The China case is not so simple.

Institutional Factors

- Forging Ahead Strategy
- Heavy Industry Priority
- Capital Accumulation
- Surplus Extracted from Agriculture
- Price Scissors
- Hukou System
- Urban-rural Disparity

Post Centre Planning Times

- The endowment in 1978
- Involution in agriculture
- Density of farmers
- Population Growth Rate
- Transferring and Exacerbation


Imbalanced Growth Rate
Sticky Relative Price
Labor Switching Tendency
Labor Market Barriers
Informal Sectors
Agricultural Sectors
Disparity Exacerbation

What to do ?

- How many rural people are prevented from transferring to urban areas ?
- When the incomes of all the sectors converge, what will happen to the relative price ?
- What is the tendency of labor market distortion and price deviation ?

What this paper does ?

- CGE Model
- Model Simplification
- Tendency Observation

Model Simplification

- Homogeneous Households
- Capital Market Not Considered
- International Trade Excluded
- Small Government Assumption
- Full Employment Assumption
- Competitive Market
- No Transfer cost
- Fixed Short Term Structure

The Model as a whole

$$Q_1 = A_1 K_1^{\alpha_1} L_1^{1-\alpha_1}$$

$$Q_2 = A_2 K_2^{\alpha_2} L_2^{1-\alpha_2}$$

$$\alpha_1 P_1 A_1 \left(\frac{K_1}{L_1}\right)^{\alpha_1} = w_1$$

$$\alpha_2 P_2 A_2 \left(\frac{K_2}{L_2}\right)^{\alpha_2} = w_2$$

$$C_1 + G_1 = \lambda_1 Q_1$$

$$C_2 + G_2 = \lambda_2 Q_2$$

$$D\left(P_1, P_2, C_1, C_2\right) = 0$$

$$E = s\left(P_1 Q_1 + P_2 Q_2\right)$$

$$P_1 C_1 + P_2 C_2 = E$$

$$P_1 Q_1 + P_2 Q_2 = P\left(Q_1 + Q_2\right)$$

$$L_1 + L_2 = L$$

$$w_1 = w_2$$

Exogenous Variables

$$G_1, G_2, \lambda_1, \lambda_2, P, L$$

- Government Consumption of S1
- Government Consumption of S2
- Real Consuming Rate of S1
- Real Consuming Rate of S2
- GDP Deflator
- Total Employment

Parameters to be Estimated

$$A_1, A_2, K_1, K_2, \alpha_1, \alpha_2, D$$

- Total Factor Productivity of S1
- Total Factor Productivity of S2
- Capital Formation of S1
- Capital Formation of S2
- Capital Input-Output Elasticity of S1
- Capital Input-Output Elasticity of S2
- Parameters of the demand curve

Endogenous Variables

$$Q_1, Q_2, C_1, C_2, L_1, L_2, P_1, P_2, E, w_1, w_2, s$$

- Real Products of S1&S2
- Real Consumption of S1&S2
- Real Labor Employed of S1&S2
- Price Index of S1&S2
- Real Household Consumption Expenditure
- Real Marginal Productivity of Labor of S1&S2
- Real Consumption Rate

Demand Function

$$D\left(P_1, P_2, C_1, C_2\right) = 0$$

- Engel's Law
- With increase in real income, people prefer to spend relatively less of the additional income on agricultural products.
- This phenomenon is much more significant in rapidly developing countries.

Utility Function

- Based on the diminishing marginal utility
- Based on constrained optimization
- Consistent with Theorem of Petty & Clarke
- Consistent with Engel's Law
- Not complex to do econometric analysis
- Easy to solve
- Stable solution

Utility Function

- CES function is rejected
- Constant substitute elasticity
- Linear extension line

$$\max_{C_1,C_2} U = \left[\delta C_1^{\rho} + (1-\delta) C_2^{\rho}\right]^{1/\rho}$$

$$s.t. \quad P_1 C_1 + P_2 C_2 = E$$

$$\Rightarrow \frac{\delta}{1-\delta}\left(\frac{C_1}{C_2}\right)^{\rho} = \frac{P_1}{P_2}$$

- The relative consumption expenditure is constant with constant relative price.

Utility Function

- How to revise it ?

$$U = \delta C_1^{\rho_1} + (1-\delta) C_2^{\rho_2}$$

$$\sigma = \frac{d \ln (C_1/C_2)}{d \ln (U_{C_2}/U_{C_1})} = \frac{d \ln (C_1/C_2)}{d \ln \left\{ \left[\rho_2 (1-\delta) C_2^{\rho_2 - 1} \right] / \left[\rho_1 \delta C_1^{\rho_1 - 1} \right] \right\}}$$

$$= \frac{1}{(1-\rho_1)} \frac{d \ln C_1 / d \ln C_2 - 1}{d \ln C_1 / d \ln C_2 - (1-\rho_2)/(1-\rho_1)} \neq const.$$

When $\rho_1 = \rho_2 = \rho$

the function is regressed to CES.

Utility Function

Let $0 < \rho_1 < \rho_2 < 1$

- When the real consumption of the agricultural products and non-agricultural products increase at the equal rate, the elasticity of agricultural products is decreasing faster than that of non-agricultural products in ratio.
- Theorem of Petty & Clarke

Utility Function

$$\max_{C_1, C_2} U = \delta C_1^{\rho_1} + (1-\delta) C_2^{\rho_2}$$

$$s.t. \quad P_1 C_1 + P_2 C_2 = E$$

$$\Rightarrow \frac{\delta}{1-\delta} \cdot \frac{\rho_1 C_1^{\rho_1 - 1}}{\rho_2 C_2^{\rho_2 - 1}} = \frac{P_1}{P_2}$$

$$\eta = P_1 C_1 / E$$

$$C_1 = \eta E / P_1$$

$$C_2 = (1-\eta) E / P_2$$

$$\Rightarrow \frac{\delta}{1-\delta} \cdot \frac{\rho_1}{\rho_2} \cdot \frac{P_2^{\rho_2}}{P_1^{\rho_1}} \cdot \frac{\eta^{\rho_1 - 1}}{(1-\eta)^{\rho_2 - 1}} \cdot E^{\rho_1 - \rho_2} = 1$$

Utility Function

- When the relative price is constant,

$$\frac{d \ln C_2}{d \ln C_1} = \frac{1-\rho_1}{1-\rho_2} > 1 \qquad \text{where} \quad 0 < \rho_1 < \rho_2 < 1$$

i.e. The changing rate of C2 is lager than that of C1, thus consistent with Engel's Law.

Necessary Indicators

Output

1. Nominal GDP
2. Nominal Agricultural GDP
3. Real GDP Index
4. Real Agricultural GDP Index

Input

5. Labor Employed
6. Labor in Agricultural Sectors
7. Social Capital Formation
8. Agricultural Re-input Rate

Consumption

9. Average Consumption Per Capita
10. Engel Coefficients
11. Consumption of Government
12. Expenditure of Administration

Raw Data

Year	Output				Input					Consumption			
	Nominal GDP (￥100m)		Real GDP Index (1978=100)		Population (10k)	Employment (10k)		CF (￥100m)	ARI	Households (￥100m)		Government (￥100m)	
	Total	A	Total	A		Total	A			CE	EC	TC	MC
1991	21781	5342	307.6	195.2	115823	65491	39098	7868	16.0%	932	55.8%	3361	343.6
1992	26923	5867	351.4	204.4	117171	66152	38699	10086	13.9%	1116	55.2%	4203	424.6
1993	35334	6964	400.4	214.0	118517	66808	37680	15718	14.9%	1393	53.7%	5488	535.8
1994	48198	9573	452.8	222.6	119850	67455	36628	20341	16.2%	1833	53.8%	7398	729.4
1995	60794	12136	502.3	233.7	121121	68065	35530	25470	17.2%	2355	53.6%	8378	872.7
1996	71177	14015	552.6	245.6	122389	68950	34820	28785	16.6%	2789	52.3%	9964	1040.8
1997	78973	14442	603.9	254.2	123626	69820	34840	29968	16.1%	3002	50.4%	11219	1137.2
1998	84402	14818	651.2	263.1	124761	70637	35177	31314	15.8%	3159	48.3%	12359	1326.8
1999	89677	14770	700.9	270.5	125786	71394	35768	32952	15.5%	3346	46.1%	13717	1525.7
2000	99215	14945	759.9	277.0	126743	72085	36043	34843	15.3%	3632	43.0%	15661	1787.6
2001	109655	15781	823.0	284.8	127627	73025	36513	39769	15.8%	3869	41.6%	17665	2197.5
2002	120333	16537	897.8	293.0	128453	73740	36870	45565	16.2%	4106	40.6%	19120	2979.4
2003	135823	17382	987.8	300.3	129227	74432	36546	55963	16.4%	4411	39.9%	20615	3437.7
2004	159878	21413	1087.4	319.3	129988	75200	35269	69168	16.5%	4925	40.6%	23199	4059.9
2005	183217	22420	1200.8	336.0	130756	75825	33970	80646	16.6%	5463	39.3%	26605	4835.4
2006	211923	24040	1340.7	352.8	131448	76400	32561	94402	16.4%	6138	37.9%	30118	5639.1
2007	249530	28095	1500.7	365.8	132129	76990	31444	110251	16.2%	7016	38.2%	35874	6434.7

Data Transformation

- Total & Agriculture → Non-Agriculture
- Output & Real Index → GDP Deflator
- National & Population → Per Capita
- Output & Re-input → Consumption Rate
- Food Consumption & Engel & Agricultural Consumption → Share of Expenditure to Purchase Agricultural Products
- Administration Expenditure & Share for Regalement → Agricultural Products Consumed by the Government

Exogenous Variables

Year	Q1	Q2	L1	L2	P1	P2	C1	C2	w1	w2	E	Engel*	GDP
1991	5342	16439	39098	26393	1.000	1.000	4404	6391	622	1115	10795	40.8%	21781
1992	5594	19226	38699	27453	1.046	1.092	4724	7416	691	1373	13076	37.9%	26846
1993	5856	22376	37680	29128	1.184	1.262	4885	8439	842	1743	16509	35.2%	35173
1994	6092	25809	36628	30827	1.563	1.489	5002	9427	1191	2243	21969	35.8%	47951
1995	6396	28997	35530	32535	1.888	1.670	5197	11122	1556	2677	28524	34.6%	60500
1996	6721	32221	34820	34130	2.075	1.766	5499	12778	1834	2998	34134	33.6%	70849
1997	6957	35579	34840	34979	2.065	1.804	5721	13914	1889	3302	37113	32.0%	78550
1998	7200	38563	35177	35460	2.042	1.790	5925	15084	1919	3513	39412	30.9%	83730
1999	7403	41822	35768	35626	1.979	1.777	6096	16708	1881	3764	42088	28.9%	88967
2000	7581	45780	36043	36042	1.955	1.826	6233	18332	1889	4185	46033	26.7%	98415
2001	7794	49931	36513	36512	2.006	1.863	6337	19440	1969	4602	49379	26.0%	108657
2002	8018	54928	36870	36870	2.042	1.871	6422	20903	2044	5039	52743	25.1%	119145
2003	8218	61161	36546	37886	2.098	1.921	6541	22291	2167	5596	57002	24.3%	134732
2004	8738	67734	35269	39931	2.433	2.030	6935	23003	2766	6207	64019	26.5%	158759
2005	9195	75412	33970	41855	2.426	2.122	7252	25207	3007	6877	71432	24.8%	182331
2006	9655	84994	32561	43839	2.482	2.204	7604	27934	3364	7672	80683	23.5%	211291
2007	10011	96067	31444	45546	2.801	2.301	7910	30587	4071	8703	92702	23.9%	249091

*The definition of “Engel Coefficient” is modified.

Parameter Estimation

$$\alpha_1 = 0.4556, \quad (t = 12.912, \quad p = 0.000)$$

$$\alpha_2 = 0.1790, \quad (t = 2.110, \quad p = 0.028)$$

Actually, a bit change in the elasticity does not have significant effects on the equilibrium according to the test of robustness by introduce random disturbance.

Parameter Estimation

$$\ln E = \beta_1 \ln \eta + \beta_2 \ln(1-\eta) + \beta_3 + \varepsilon$$

$$\beta_1 = \frac{\rho_1 - 1}{\rho_2 - \rho_1}, \beta_2 = -\frac{\rho_2 - 1}{\rho_2 - \rho_1}, \beta_3 = \frac{1}{\rho_2 - \rho_1} \ln\left(\frac{\delta}{1-\delta} \mathrm{g} \frac{\rho_1}{\rho_2} \mathrm{g} \frac{P_2^{\rho_2}}{P_1^{\rho_1}} \right)$$

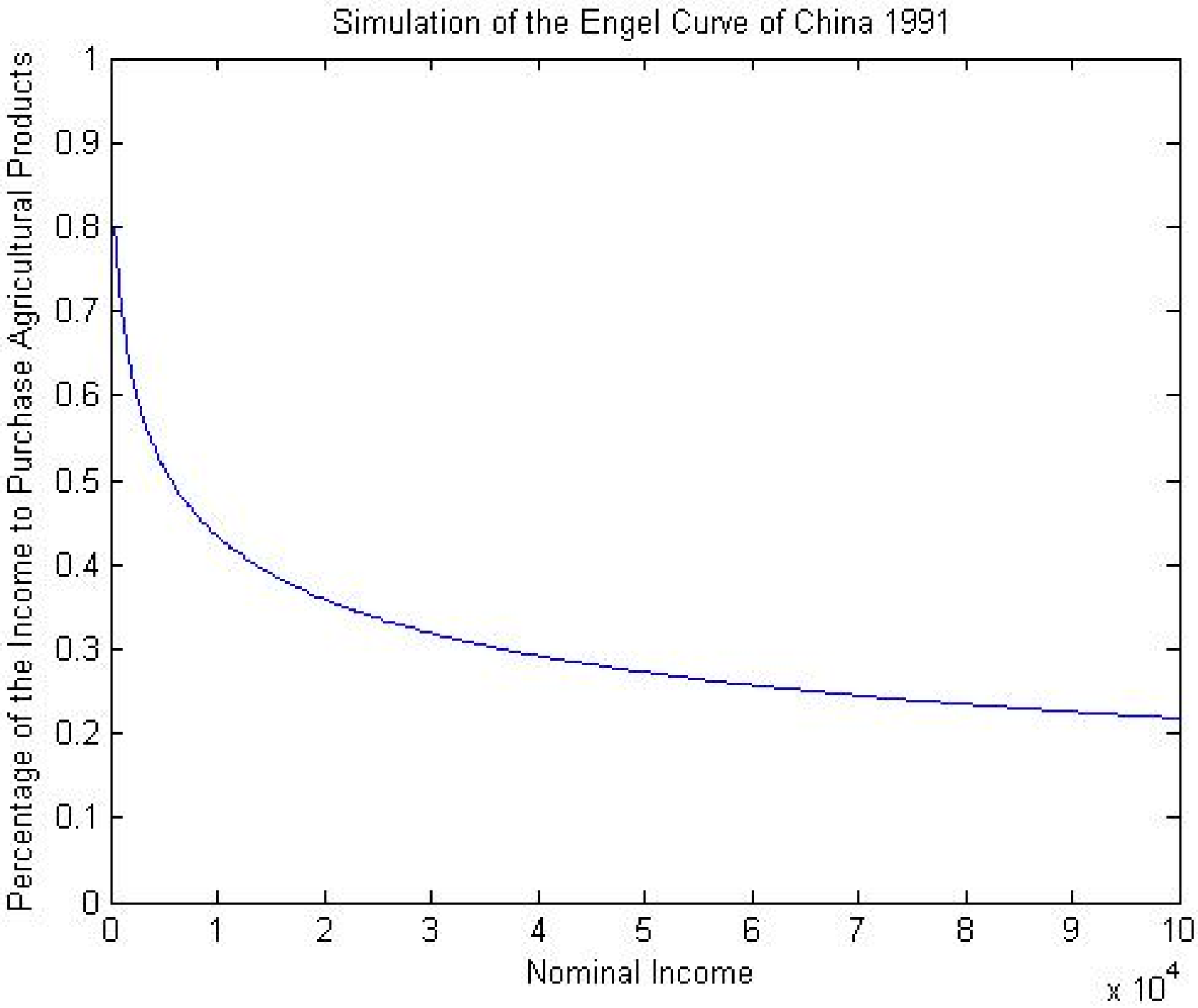
$$\delta = \left\{ \left[e^{\beta_3(\rho_2 - \rho_1)} \mathrm{g} \frac{P_1^{\rho_1}}{P_2^{\rho_2}} \mathrm{g} \frac{\rho_2}{\rho_1} \right]^{-1} + 1 \right\}^{-1}$$

$$\beta_1 = -2.5948 \left(t = -13.62, p = 0.000 \right)$$

$$\beta_2 = 1.5948 \left(t = 8.37, p = 0.000 \right)$$

$$\beta_3 = 7.9519 \left(t = 44.17, p = 0.000 \right)$$

$$\Rightarrow \rho_1 = 0.5576, \ \rho_2 = 0.7281, \ \overline{\delta} = 0.7404$$


Simulation of the Engel Curve of China 1991
Percentage of the Income to Purchase Agricultural Products
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
1
2
3
4
5
6
7
8
9
10
Nominal Income
x 10^4

Price Adjustment

When 1 unit of labor transfers

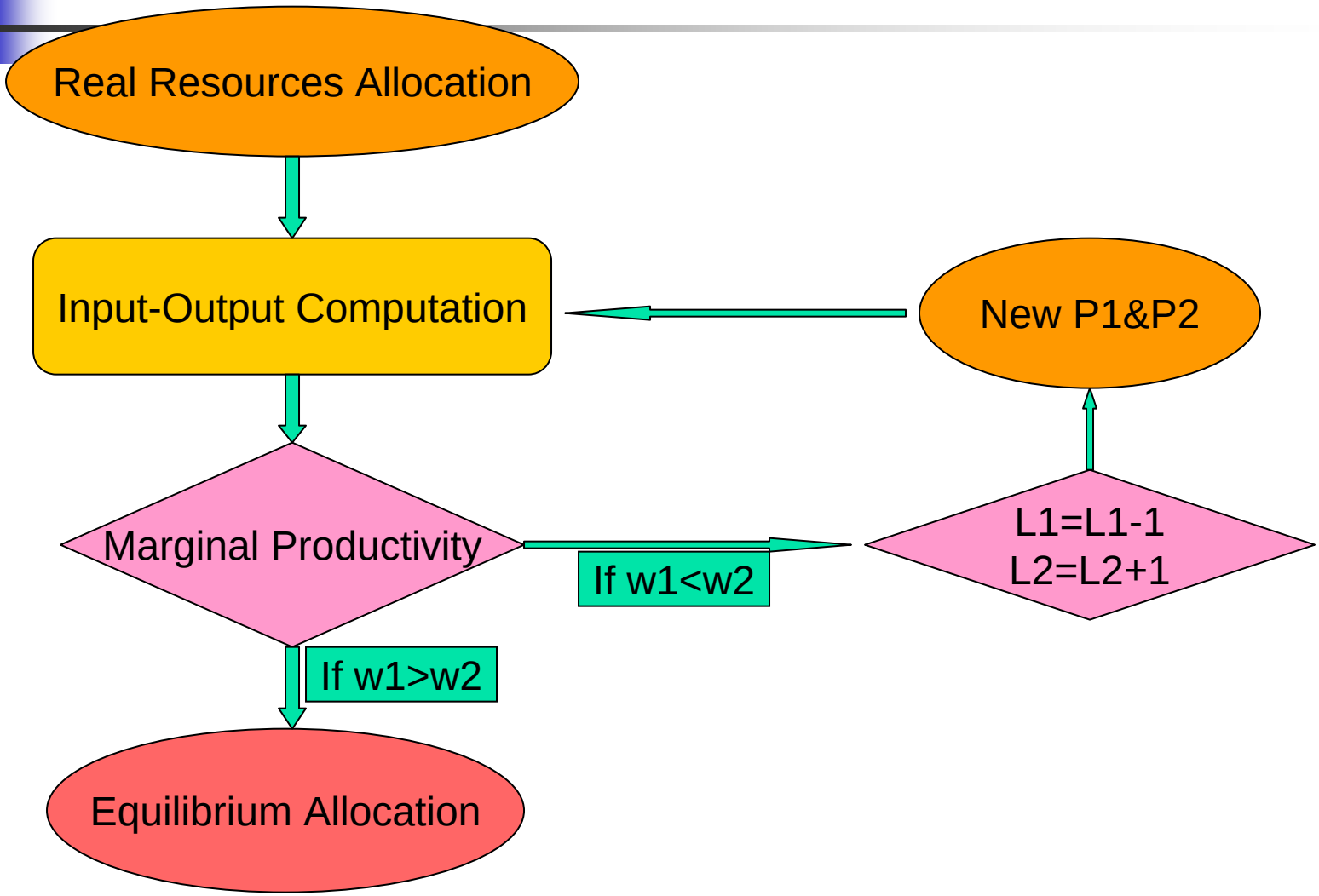
$$Q_1' = A_1 K_1^{\alpha_1} \left(L_1 - 1\right)^{1-\alpha_1} \qquad C_1' + G_1 = \lambda_1 Q_1'$$

$$Q_2' = A_2 K_2^{\alpha_2} \left(L_2 + 1\right)^{1-\alpha_2} \qquad C_2' + G_2 = \lambda_2 Q_2'$$

$$P_1' = \frac{\delta\rho_1 C_1'^{\rho_1 - 1} P\left(Q_1' + Q_2'\right)}{\delta\rho_1 C_1'^{\rho_1 - 1} Q_1' + \left(1-\delta\right)\rho_2 C_2'^{\rho_2 - 1} Q_2'}$$

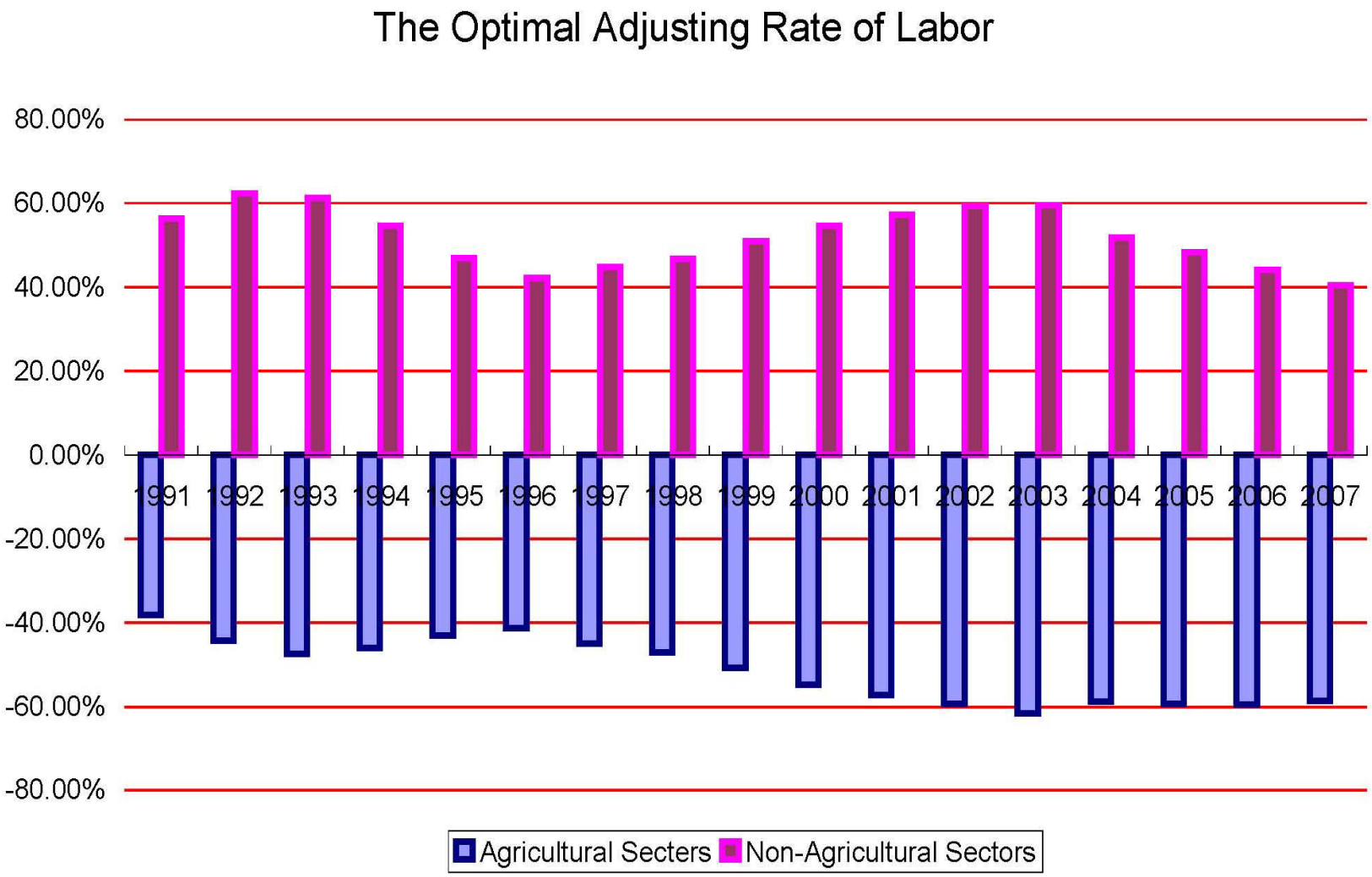
$$P_2' = \frac{\left(1-\delta\right)\rho_2 C_2'^{\rho_2 - 1} P\left(Q_1' + Q_2'\right)}{\delta\rho_1 C_1'^{\rho_1 - 1} Q_1' + \left(1-\delta\right)\rho_2 C_2'^{\rho_2 - 1} Q_2'}$$

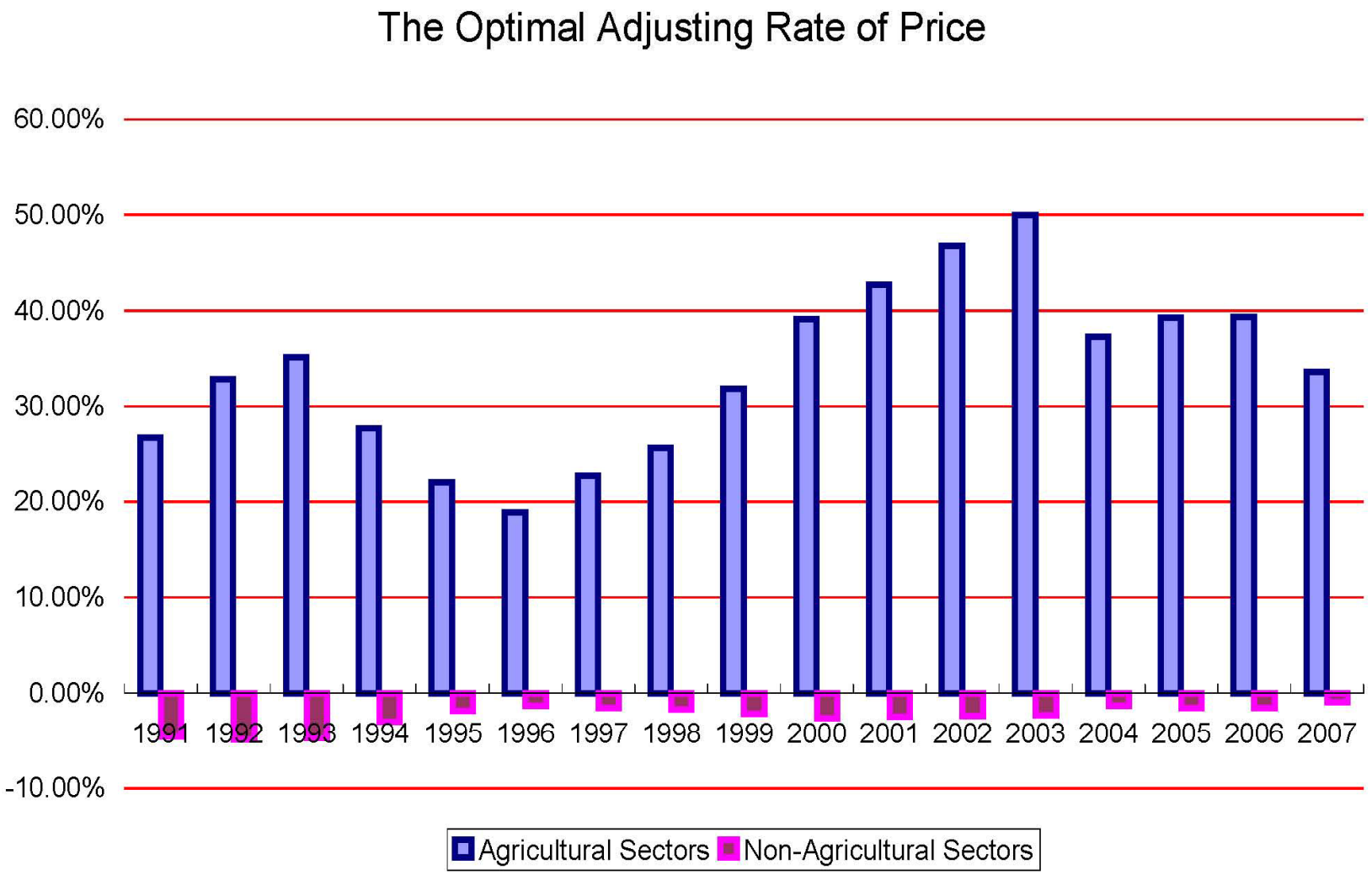
Algorithm of the Model



Simulation of Labor and Price

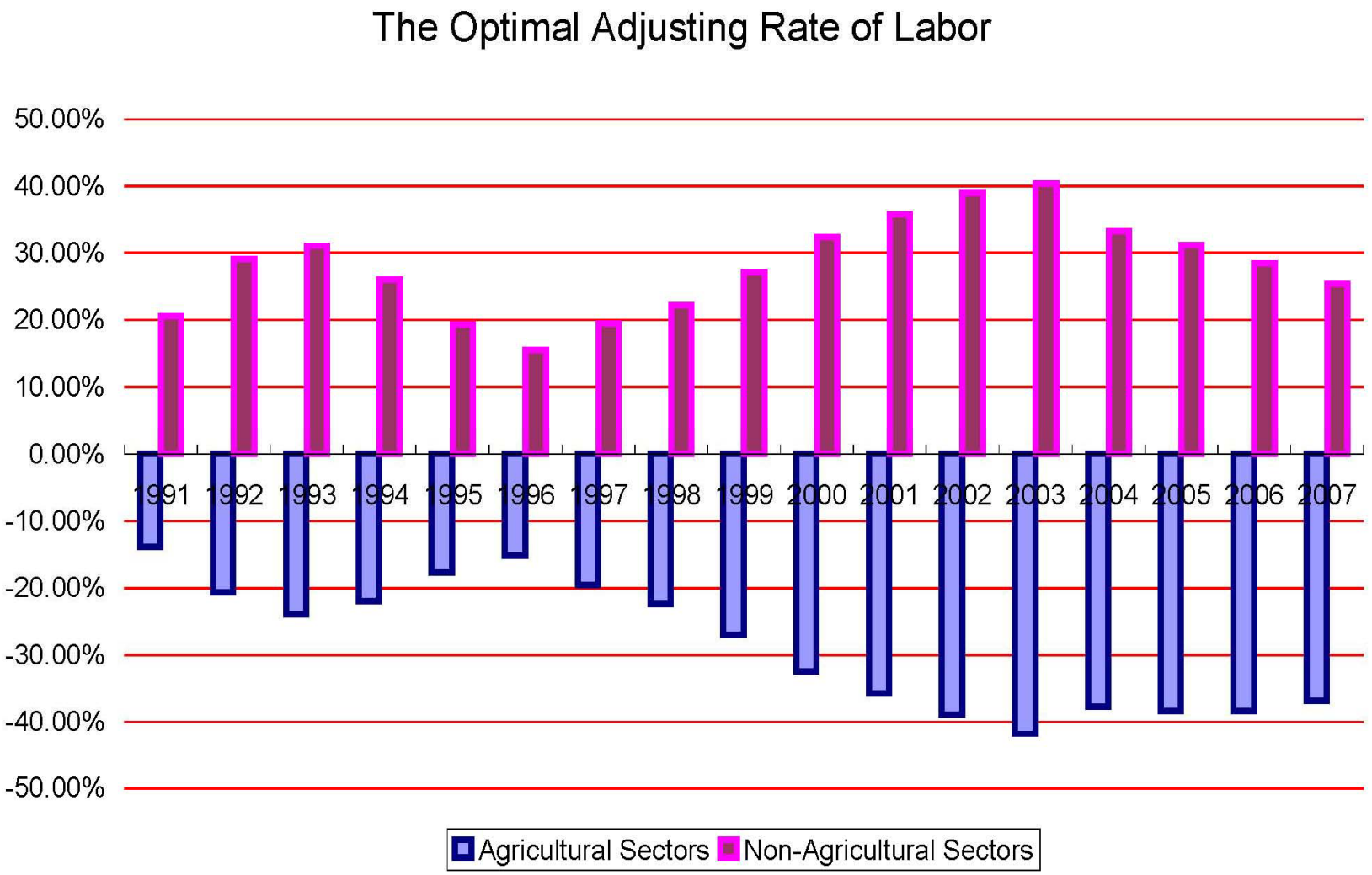
Year	w1=w2				w1=90%w2				w1=80%w2				w1=70%w2			
	L1	L2	P1	P2	L1	L2	P1	P2	L1	L2	P1	P2	L1	L2	P1	P2
1991	24204	41287	1.267	0.954	26880	38611	1.216	0.958	30009	35482	1.162	0.964	33659	31832	1.102	0.974
1992	21583	44569	1.389	1.038	24114	42038	1.333	1.042	27122	39030	1.274	1.048	30707	35445	1.209	1.056
1993	19853	46955	1.600	1.202	22265	44543	1.537	1.206	25161	41647	1.468	1.211	28659	38149	1.394	1.219
1994	19791	47664	1.996	1.445	22201	45254	1.916	1.449	25096	42359	1.830	1.455	28597	38858	1.736	1.463
1995	20241	47824	2.302	1.639	22702	45363	2.210	1.643	25659	42406	2.110	1.649	29230	38835	2.002	1.659
1996	20430	48520	2.467	1.743	22917	46033	2.368	1.748	25904	43046	2.261	1.754	29513	39437	2.144	1.764
1997	19189	50630	2.534	1.775	21583	48236	2.433	1.779	24481	45338	2.323	1.785	28017	41802	2.204	1.793
1998	18607	52030	2.565	1.759	20956	49681	2.462	1.763	23810	46827	2.351	1.767	27310	43327	2.229	1.775
1999	17651	53743	2.608	1.738	19918	51476	2.503	1.741	22687	48707	2.390	1.745	26108	45286	2.267	1.751
2000	16323	55762	2.720	1.778	18462	53623	2.611	1.780	21095	50990	2.493	1.784	24376	47709	2.364	1.789
2001	15622	57403	2.862	1.816	17690	55335	2.747	1.817	20244	52781	2.622	1.820	23444	49581	2.487	1.824
2002	14972	58768	2.998	1.826	16964	56776	2.876	1.827	19435	54305	2.745	1.829	22545	51195	2.602	1.833
2003	14022	60410	3.147	1.876	15911	58521	3.019	1.878	18263	56169	2.881	1.879	21243	53189	2.731	1.882
2004	14535	60665	3.340	2.005	16481	58719	3.204	2.006	18899	56301	3.058	2.008	21955	53245	2.898	2.011
2005	13786	62039	3.376	2.089	15646	60179	3.239	2.091	17965	57860	3.091	2.093	20909	54916	2.931	2.097
2006	13181	63219	3.456	2.169	14971	61429	3.316	2.171	17209	59191	3.166	2.173	20061	56339	3.002	2.177
2007	13051	63939	3.741	2.280	14827	62163	3.589	2.281	17050	59940	3.426	2.284	19882	57108	3.248	2.287


The Optimal Adjusting Rate of Labor
80.00%
60.00%
40.00%
20.00%
0.00%
-20.00%
-40.00%
-60.00%
-80.00%
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Agricultural Secters
Non-Agricultural Sectors


The Optimal Adjusting Rate of Price
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
-10.00%
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Agricultural Sectors
Non-Agricultural Sectors

$w1 \neq w2$

- The Labor productivity of non-agricultural sectors increases much fast than that of agricultural sectors.
- The relative price of agricultural is sticky.
- Subsidies for agriculture
- Intangible cost living in the crowed city
- w1=70%w2 is acceptable.


The Optimal Adjusting Rate of Labor
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
-10.00%
-20.00%
-30.00%
-40.00%
-50.00%
1991
1992
1993
1994
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1997
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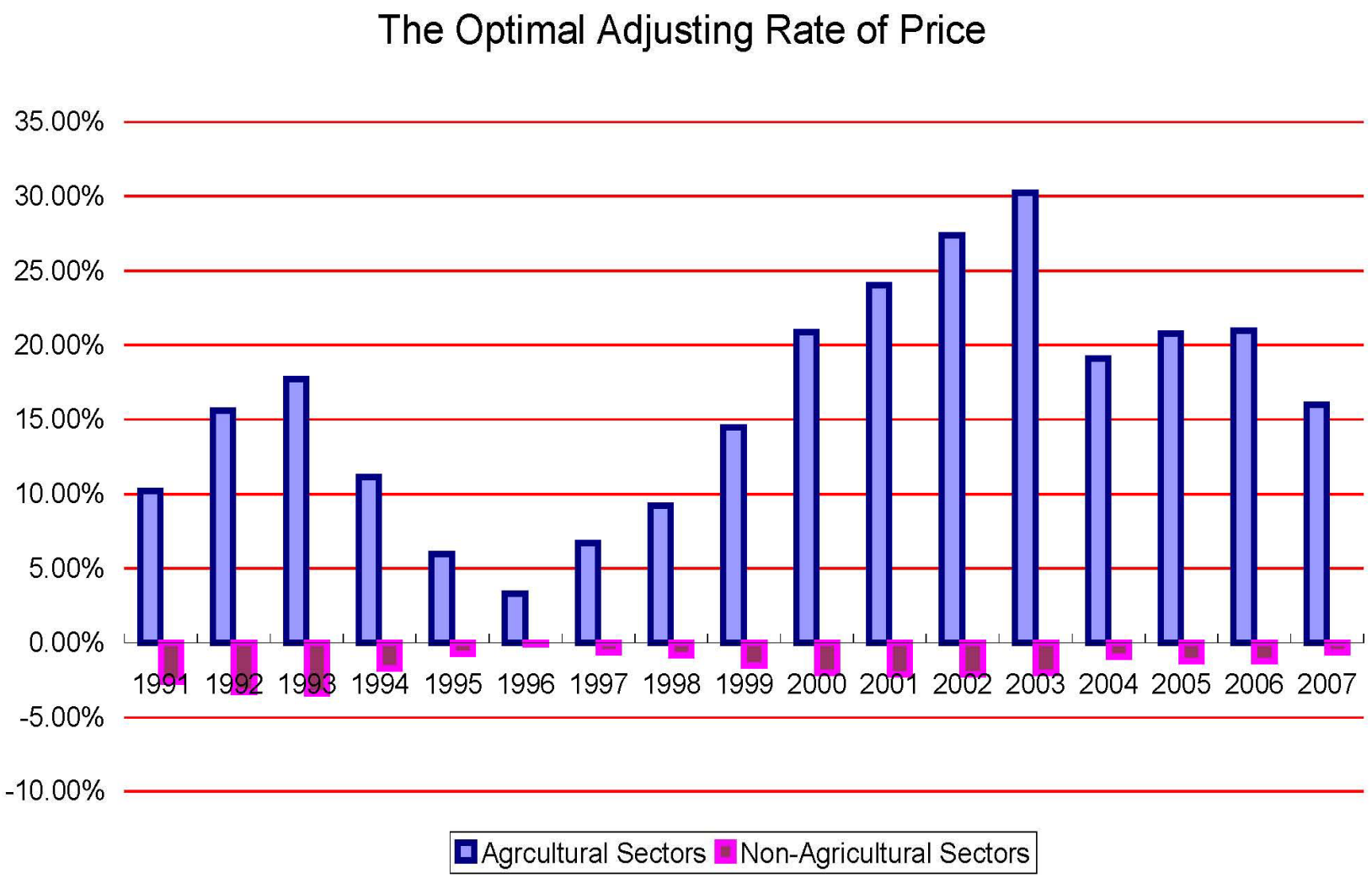
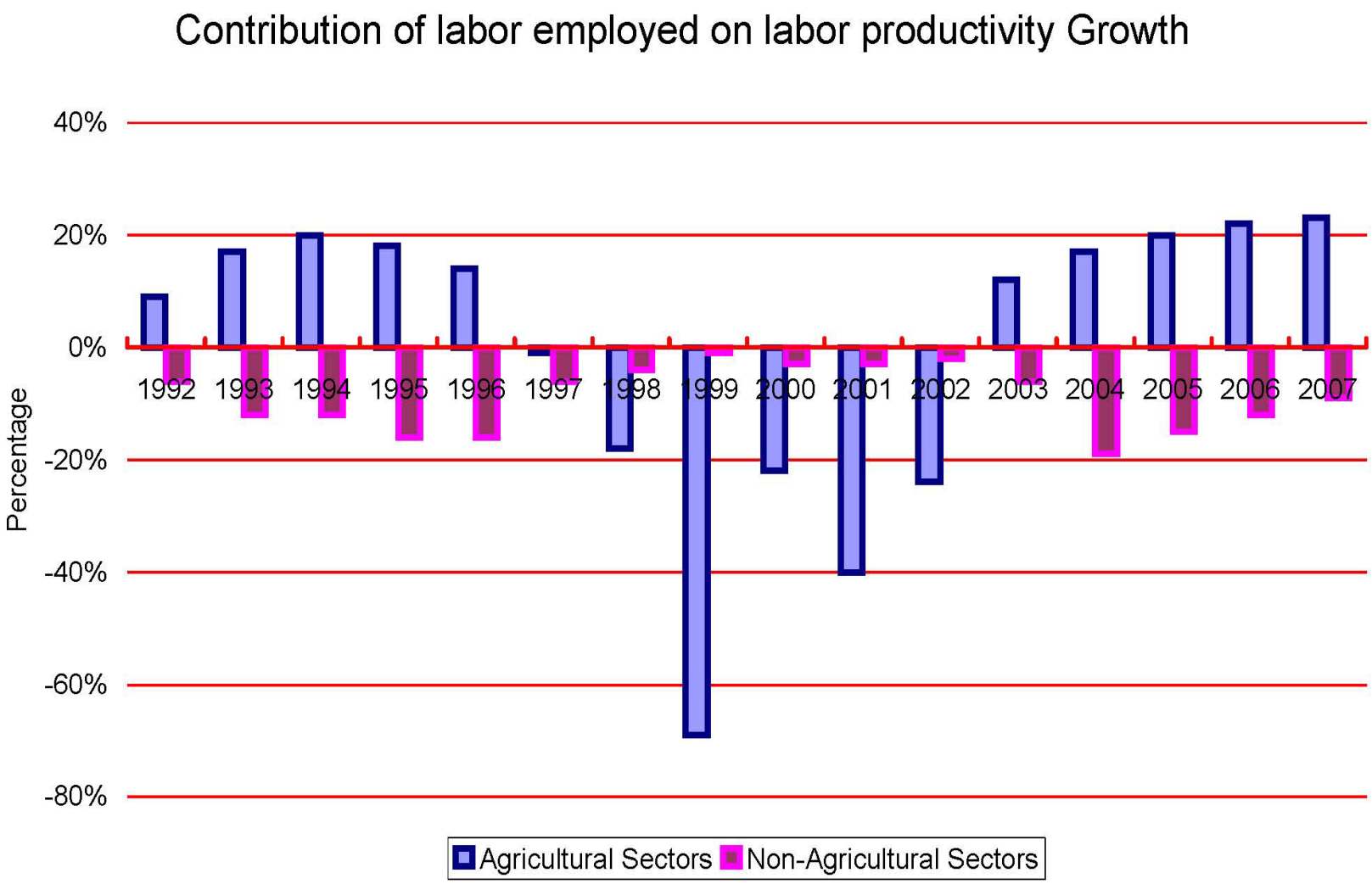
2003
2004
2005
2006
2007
Agricultural Sectors
Non-Agricultural Sectors


The Optimal Adjusting Rate of Price
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
-5.00%
-10.00%
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Agrcultural Sectors
Non-Agricultural Sectors

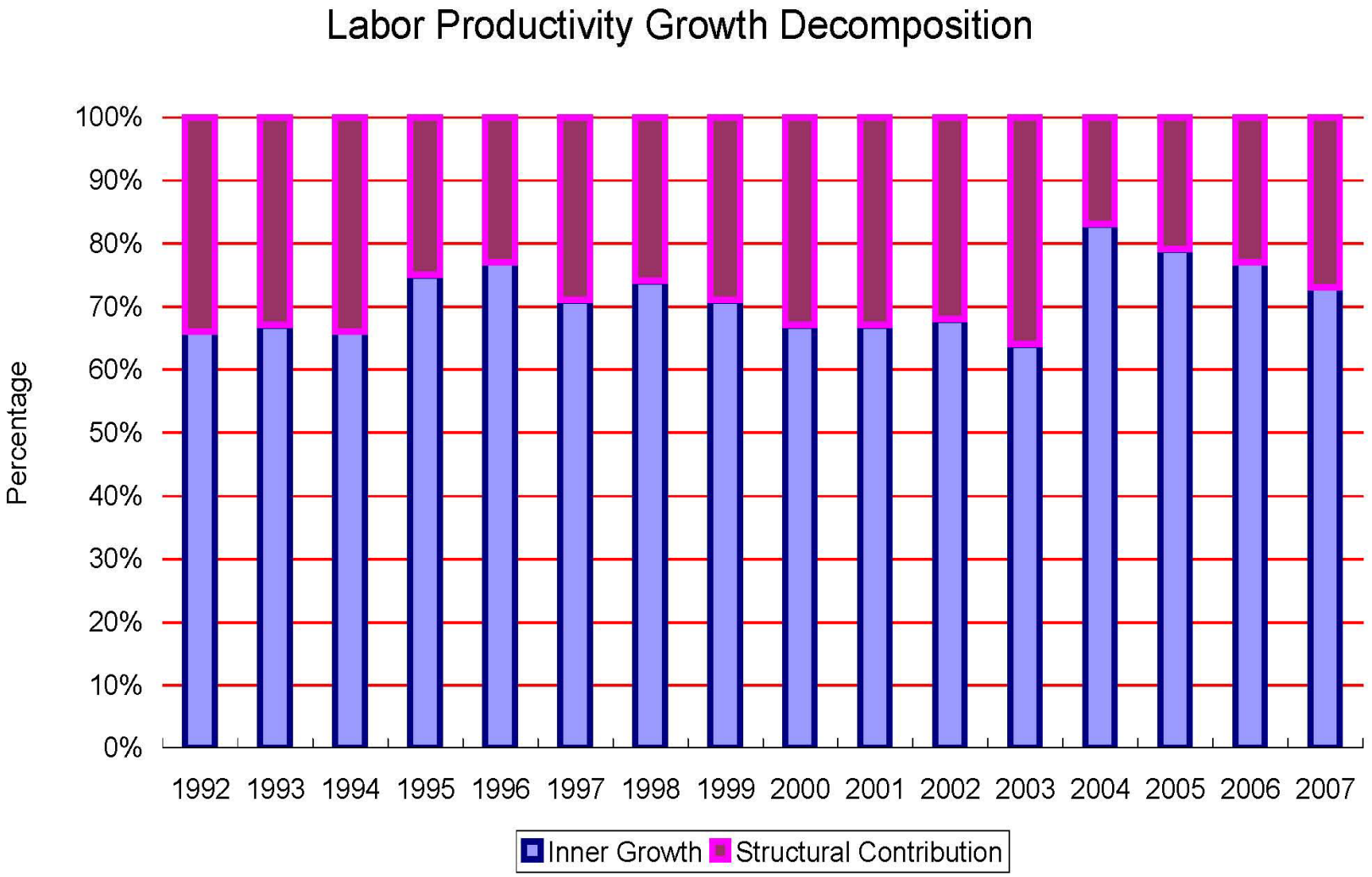
Labor Transferring

- Labor productivity decreases as the labor employed increases.
- Growth of labor productivity consists of no-labor growth and labor transferring.
- Without the Labor transferring, the disparity would be even larger.


Contribution of labor employed on labor productivity Growth
40%
20%
0%
-20%
-40%
-60%
-80%
Percentage
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Agricultural Sectors
Non-Agricultural Sectors

Structure Growth

- Structure upgrading contributes to the aggregate growth as well as inner growth in each sector.
- In some years, the aggregate growth rate is even higher than that in each sector.


Labor Productivity Growth Decomposition
Percentage
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Inner Growth
Structural Contribution

Conclusion

- Significant Distortion
- Labor Transferring
- Structure Upgrading
- Three Stages

Labor Market Distortion

- Involution in Agriculture
- 37% Labor Surplus
- Current Price of Agricultural Products Increasing by 16%
- Labor Surplus under Control
- Not much Better

Labor Transferring

- Moving off Agriculture
- Once Reversed
- Contribution to the Growth
- No significant Mending

Structural Upgrading

- Inner growth in each sector is the main cause of growth.
- Structure upgrading explains about one quarter of the growth rate.
- This contribution ratio fluctuates in the short run but stays on a relative stable level in the long run.

Three Stages

- Residual Influence of Institutional Reform in Agriculture.
- Puny Agriculture
- Conversely Nurturing
- Problems Still Remaining

What has been done ?

- A simplified CGE model is Constructed.
- Parameters are estimated instead of arbitrarily set.
- Long run tendency was illustrated.
- The last 17 years has been divided into three stages.

Considering Lucas Critique

- It is naive to try to predict the effects of a change in economic policy entirely on the basis of relationships observed in historical data, especially highly aggregated historical data.
- Technology Progressing
- Preference Gradual Change

What is to be done ?

- Big Government Assumption
- Heterogeneous Preference
- Open Economy
- Dynamic Analysis
- *Stochastic Shock
- Instruction for Fiscal Policy

Postscript (My Experience)

- Despite the fact that most economic theories can not explain some phenomena in China, many theories are still valid here after adapted to the reality.
- When a model is more precise than the best statistical data for the moment, it becomes encumbrance for empirical work.
- Linear reduction of information makes the cost of research increase exponentially.

English Literature

- Lewis, W.A. (1954), Economic Development with Unlimited Supplies of Labor, Manchester School, 28 (2)
- Ranis, G. and J.C. Fei (1961), A Theory of Economic Development, The American Economic Review, 51(4)
- Lucas, Robert (1976). "Econometric Policy Evaluation: A Critique." Carnegie-Rochester Conference Series on Public Policy 1: 19–46.
- Thomas Hertel and Fan Zhai, Labor Market Distortion, Rural-Urban Inequality and the Opening of China's Economy, World Bank Policy Research Working Paper 3455, November 2004
- B. Essama-Nssah, Building and Running General Equilibrium Models in EViews, World Bank Policy Research Working Paper 3197, January 2004
- B. Essama-Nssah, Building an Applied General Equilibrium Model, World Bank PPT, May 2006
- B. Essama-Nssah, The Logic of General Equilibrium Modeling, World Bank PPT, October 13, 2005
- B. Essama-Nssah, A Two Sector Model of an Open Economy, World Bank PPT, October 16, 2005
- Ian Sue Wing, Computable General Equilibrium Models and Their Use in Ecomomy-Wide Policy Analysis
- Shantayanan Devarajan, Delfin S. Go, Jeffrey D. Lewis, Sherman Robinson, and Pekka Sinko, Simple General Equilibrium Modeling
- Justin Lin (Yifu Lin) and (Miaojie Yu), The Economics of Price Scissors: An Empirical Investigation for China, China Center for Economic Research, Peking University, NO. 2008001, April 2008
- Zhang Qi, Tao Ran, Liu Mingxing, Yiu Por Chen, Vincent, Financial Development and Urban-Rural Income Disparity in China, For the Chinese Economist Society Conference 2003 at University of Michigan

Chinese Literature

- Fan Zhai, Shantong Li and Shan Feng, A CGE Model on China's Economy, The Journal of Quantitative & Technical Economic, 1997 (3)
- Gong Yi, Some Problems on the CGE Model，The Journal of Quantitative & Technical Economic, 1997 (8)
- Jun Pang, and Yuanchang Shi, Theory, Properties and applications of CGE Model, Theory Monthly, 2005 (3)
- Jianjun Zhou, Tao Wang, Some Frontier Issues about CGE Model, Modern Economic Science, Sept 2001 (5)
- Juan Sheng, The CGE Model of Chinese Economy and Policy Analysis, Master Paper of Renmin University of China, May 2005
- Yingqi Ma, Construct and Application of Beijing CGE, Master Paper of Jilin University of China, April 2007
- Zhuohua Zhou and Zongyi Zhang, A Computable General Equilibrium Model of Chinese Economy, Journal of Chongqing University (Natural Science Edition), July 2000 (4)
- Ying Gao and Shantong Li, The Infrastructure Construction and Poverty Reduction in Rural China: A Simulation Analysis within a CGE Model Framework, Journal of Quantitative & Technical Economic, 2006 (6)
- Hongbin Zhao, A Study on the Technological Change of Chinese Primary Industry since Reform in 1978, Journal of Finance and Economics, Dec 2004 (12)