

# 新时代中国区域发展新格局形成机制

## ——基于“动力-效率-质量”三元体系的演化经济分析

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### 附录 1：中国区域发展“动力-效率-质量”三元体系面板单位根及协整检验

表1 面板单位根检验结果

| 变量                             | Levin-Lin-Chu           | Im-Pesaran-Shin         | PP-Fisher                | Harris-Tzavalis        | Breitung                |
|--------------------------------|-------------------------|-------------------------|--------------------------|------------------------|-------------------------|
| <i>Indynamic</i>               | 11.1344<br>(1.0000)     | 26.2326<br>(1.0000)     | 7.4757<br>(1.0000)       | 1.0446<br>(1.0000)     | 18.0229<br>(1.0000)     |
| $\Delta$ <i>Indynamic</i>      | -1.9611**<br>(0.0249)   | -10.1389***<br>(0.0000) | 372.8237***<br>(0.0000)  | 0.5459***<br>(0.0000)  | -12.5970***<br>(0.0000) |
| <i>lninefficiency</i>          | -4.6250***<br>(0.0000)  | -4.4221***<br>(0.0000)  | 152.8237**<br>(0.0000)   | 0.8515***<br>(0.0000)  | -1.9393**<br>(0.0262)   |
| $\Delta$ <i>lninefficiency</i> | -17.4124***<br>(0.0000) | -22.4187***<br>(0.0000) | 1463.9882***<br>(0.0000) | -0.0441***<br>(0.0000) | -12.9712***<br>(0.0000) |
| <i>lnquality</i>               | 6.2798<br>(1.0000)      | 7.5846<br>(1.0000)      | 84.2341<br>(0.1535)      | 0.9729<br>(0.9998)     | 10.7063<br>(1.0000)     |
| $\Delta$ <i>lnquality</i>      | -5.9712***<br>(0.0000)  | -19.3787***<br>(0.0000) | 1082.1234***<br>(0.0000) | 0.0857***<br>(0.0000)  | -7.8389***<br>(0.0000)  |

注：括号内为 p 值；\*、\*\*和\*\*\*分别代表通过 10%、5%和 1%的显著性水平检验。

表2 面板协整检验结果

| 检验方法       | <i>Indynamic</i>                     |                        | <i>lninefficiency</i>  |                       | <i>lnquality</i>      |          |
|------------|--------------------------------------|------------------------|------------------------|-----------------------|-----------------------|----------|
|            | 统计量                                  | p 值                    | 统计量                    | 统计量                   | 统计量                   | p 值      |
| Kao        | Modified Dickey-Fuller               | 6.5355***<br>(0.0000)  | -5.9011***<br>(0.0000) | 2.5347***<br>(0.0000) | 3.0325***<br>(0.0000) | (0.0056) |
|            | Dickey-Fuller                        | 7.5087***<br>(0.0000)  | -5.1344***<br>(0.0000) | 3.6841***<br>(0.0001) | 1.6979**<br>(0.0000)  | (0.0012) |
|            | Augmented Dickey-Fuller              | 4.4175***<br>(0.0000)  | -3.6841***<br>(0.0000) | 3.3316***<br>(0.0000) | 4.0418***<br>(0.0000) | (0.0448) |
|            | Unadjusted modified<br>Dickey-Fuller | 7.2060***<br>(0.0000)  | -6.1213***<br>(0.0000) | 4.5174***<br>(0.0000) | 7.6938***<br>(0.0000) | (0.0004) |
|            | Unadjusted Dickey-Fuller             | 10.8941***<br>(0.0000) | -5.2124***<br>(0.0000) | 4.5174***<br>(0.0000) | 7.6938***<br>(0.0000) | (0.0000) |
| Pedroni    | Modified Phillips-Perron             | 5.7406***<br>(0.0000)  | 0.4081<br>(0.3416)     | 4.5174***<br>(0.0000) | 7.6938***<br>(0.0000) | (0.0000) |
|            | Phillips-Perron                      | 8.6019***<br>(0.0000)  | -1.9039**<br>(0.0285)  | 4.5174***<br>(0.0000) | 7.6938***<br>(0.0000) | (0.0000) |
|            | Augmented Dickey-Fuller              | 13.9189***<br>(0.0000) | -1.0980<br>(0.1361)    | 4.5174***<br>(0.0000) | 7.6938***<br>(0.0000) | (0.0000) |
| Westerlund | Variance ratio                       | -2.0638**<br>(0.0195)  | -3.6534***<br>(0.0001) | 1.6614**<br>(0.0483)  |                       |          |

注：括号内为p值；\*、\*\*和\*\*\*分别代表通过10%、5%和1%的显著性水平检验。

## 附录 2：中国区域发展“动力-效率-质量”三元体系滞后阶数及完整结果

表3 面板误差修正模型滞后阶数选择

| 滞后阶数 | AIC      | BIC       | HQIC      |
|------|----------|-----------|-----------|
| 1    | -9.01192 | -8.56538  | -8.84481  |
| 2    | -5.24443 | -4.75307  | -5.06029  |
| 3    | -10.5648 | -10.0266  | -10.3628  |
| 4    | -11.0105 | -10.4232  | -10.7898  |
| 5    | -11.1653 | -10.5266  | -10.925   |
| 6    | -11.3391 | -10.6464  | -11.0781  |
| 7    | -11.1277 | -10.3782  | -10.8448  |
| 8    | -11.528* | -10.7187* | -11.2221* |
| 9    | -10.7213 | -9.849    | -10.391   |
| 10   | -11.1764 | -10.2374  | -10.8202  |

表4 面板误差修正模型完整估计结果

| 估计方法                 |                       | PMG                     |                         |                       | DFE                   |                         |                        |                       |
|----------------------|-----------------------|-------------------------|-------------------------|-----------------------|-----------------------|-------------------------|------------------------|-----------------------|
|                      |                       | (1)                     | (2)                     | (3)                   | (4)                   | (5)                     | (6)                    |                       |
|                      |                       | $\Delta \ln dynamic$    | $\Delta \ln efficiency$ | $\Delta \ln quality$  | $\Delta \ln dynamic$  | $\Delta \ln efficiency$ | $\Delta \ln quality$   |                       |
| <b>ECM:</b>          | L.lndynamic           |                         | -0.2023***<br>(-4.76)   | 1.5335***<br>(9.28)   |                       | -0.0805<br>(-0.47)      | -0.7302<br>(-0.90)     |                       |
|                      | L.lnefficiency        | -0.3032***<br>(-5.17)   |                         | 2.0768***<br>(5.30)   | -0.0113<br>(-0.15)    |                         | 1.5145***<br>(3.53)    |                       |
|                      | L.lnquality           | -0.2809***<br>(-3.03)   | 0.1900***<br>(8.41)     |                       | -0.3282***<br>(-3.17) | 0.1285*<br>(1.76)       |                        |                       |
|                      | <b>SR:</b>            | ECM                     | 0.0708***<br>(12.44)    | -0.3655***<br>(-5.89) | -0.0175*<br>(-1.66)   | 0.0432***<br>(7.06)     | -0.1604***<br>(-11.74) | -0.0344***<br>(-3.85) |
|                      |                       |                         | $\Delta \ln dynamic$    | 0.3475**<br>(2.52)    | 0.2892***<br>(6.76)   |                         | 0.3546***<br>(2.97)    | 0.5281***<br>(6.71)   |
|                      |                       | $\Delta \ln efficiency$ | 0.0221***<br>(2.75)     |                       | -0.0029<br>(-0.12)    | 0.0181***<br>(2.97)     |                        | 0.0157<br>(0.77)      |
| $\Delta \ln quality$ |                       | 0.1087***<br>(5.02)     | -0.1213<br>(-1.60)      |                       | 0.0593***<br>(5.29)   | 0.0304<br>(0.61)        |                        |                       |
| L.Dlnynamic          |                       | -0.0814***<br>(-3.30)   | -0.1239<br>(-0.78)      | 0.1070***<br>(2.90)   | 0.0780***<br>(2.60)   | -0.3805***<br>(-2.87)   | 0.1727**<br>(2.08)     |                       |
| L.Dlnefficiency      | -0.0367***<br>(-6.03) | 0.3957***<br>(10.92)    | -0.0396***<br>(-2.80)   | -0.0169***<br>(-2.86) | 0.0713***<br>(2.73)   | -0.0462**<br>(-2.35)    |                        |                       |

|                  |                        |                       |                     |                      |                      |                       |
|------------------|------------------------|-----------------------|---------------------|----------------------|----------------------|-----------------------|
| L.Dlnquality     | 0.0619***<br>(3.87)    | -0.1623***<br>(-3.14) | 0.1896***<br>(5.66) | 0.0226**<br>(2.19)   | -0.0945**<br>(-2.07) | 0.1440***<br>(4.86)   |
| L2.Dlnynamic     | -0.1976***<br>(-10.43) | -0.0954<br>(-0.60)    |                     |                      |                      | 0.2307***<br>(2.94)   |
| L2.Dlnefficiency | -0.0236***<br>(-3.24)  | 0.0581<br>(1.23)      |                     |                      |                      | -0.0222<br>(-1.14)    |
| L2.Dlnquality    | -0.0773***<br>(-2.96)  | 0.1445*<br>(1.68)     |                     |                      |                      | 0.0845***<br>(2.79)   |
| L3.Dlnynamic     |                        | 0.3284*<br>(1.72)     |                     |                      |                      | 0.6935***<br>(6.85)   |
| L3.Dlnefficiency |                        | 0.1651***<br>(3.20)   |                     |                      |                      | -0.0642***<br>(-3.58) |
| L3.Dlnquality    |                        | -0.4628***<br>(-4.68) |                     |                      |                      | 0.0462<br>(1.50)      |
| L4.Dlnynamic     |                        | -0.3972***<br>(-2.89) |                     |                      |                      | -0.1419<br>(-1.44)    |
| L4.Dlnefficiency |                        | -0.0880**<br>(-2.28)  |                     |                      |                      | -0.0196<br>(-1.16)    |
| L4.Dlnquality    |                        | -0.1017<br>(-1.19)    |                     |                      |                      | -0.0409<br>(-1.36)    |
| L5.Dlnynamic     |                        | -0.8432***<br>(-5.19) |                     |                      |                      | -0.2146**<br>(-2.15)  |
| L5.Dlnefficiency |                        | 0.1203***<br>(3.49)   |                     |                      |                      | -0.0353**<br>(-2.26)  |
| L5.Dlnquality    |                        | 0.0494<br>(0.58)      |                     |                      |                      | 0.0662**<br>(2.18)    |
| L6.Dlnynamic     |                        |                       |                     |                      |                      | 0.0448<br>(0.44)      |
| L6.Dlnefficiency |                        |                       |                     |                      |                      | -0.0306**<br>(-2.01)  |
| L6.Dlnquality    |                        |                       |                     |                      |                      | 0.0400<br>(1.52)      |
| Cons             | 0.1061***<br>(13.80)   | 0.0457<br>(1.64)      | -0.0012<br>(-0.10)  | 0.0664***<br>(15.17) | -0.0234<br>(-1.12)   | -0.0679***<br>(-3.74) |

注：计算 $ECM_{t-1}$ 时已自动将各自变量系数归一化为1；括号内为z统计量；\*、\*\*和\*\*\*分别代表通过10%、5%和1%的显著性水平检验。