Appendix A

In this section, we obtain equation (3).

Taking the logarithm of Equation (2), we have:

$$\ln A_i(t) = \rho \sum_{j \neq i}^{N} w_{ij} \ln A_j(t) + \phi \sum_{j \neq i}^{N} w_{ij} \ln k_{jt} + \varphi \sum_{j \neq i}^{N} w_{ij} \ln m_{jt} + \ln \Omega_i(t) \qquad (A1)$$

We can rewrite equation (A1) as the following:

$$\left(1 - \rho \sum_{j=1}^{N} w_{ij}\right) \ln A_i(t) = \phi \sum_{j \neq i}^{N} w_{ij} \ln k_{jt} + \varphi \sum_{j \neq i}^{N} w_{ij} \ln m_{jt} + \ln \Omega_i(t) \qquad (A2)$$

We can solve (A2) for $A_i(t)$, if $\rho \neq 0$ and if $1/\rho$ is not an eigenvalue of W:

$$\ln A_i(t) = \left(1 - \rho \sum_{j=1}^{N} w_{ij}\right)^{-1} \left(\phi \sum_{j \neq i}^{N} w_{ij} \ln k_{jt} + \varphi \sum_{j \neq i}^{N} w_{ij} \ln m_{jt} + \ln \Omega_i(t)\right) \qquad (A3)$$

Replacing (A3) in the production function (1) written per worker, and then taking the logarithms, we have:

$$\ln y_{it} = \left(1 - \rho \sum_{j=1}^{N} w_{ij}\right)^{-1} \left(\phi \sum_{j \neq i}^{N} w_{ij} \ln k_{jt} + \varphi \sum_{j \neq i}^{N} w_{ij} \ln m_{jt} + \ln \Omega_i(t)\right) + \alpha \ln k_{it} + \beta \ln m_{it} \qquad (A4)$$

Putting $\Omega_i(t)$ into (A4), rewrite function (A4) in matrix form as the following:

$$\ln y = \rho (W \otimes I_T) \ln y + \alpha \ln k + \beta \ln m + \Gamma_0 + \Gamma_1 t + \Gamma_2 t^2 + v + (\phi - \alpha \rho)(W \otimes I_T) \ln k + (\varphi - \beta \rho)(W \otimes I_T) \ln m$$

where y, k, m and v are $NT \times 1$ vectors, W is a $N \times N$ matrix, $\Gamma_0 = \ln \Omega_i(0) \otimes \iota_T$, $\Gamma_1 = \delta_{1i} \otimes \iota_T$, $\Gamma_2 = \delta_{2i} \otimes \iota_T$, ι_T is the T dimensional vector of ones.

Table A.1 Industry Classifications and Codes

No.	Industry	ISIC Rev. 4
1	Agriculture	A
2	Mining, Quarrying	B
3	Food, Beverages, Tobacco	10-12
4	Textiles	13-15
5	Wood, Paper, Recorded Media Reproduction	16-18
6	Coke, Refined Petroleum	19
7	Chemicals, Pharmaceuticals	20-21
8	Rubber, Plastics, Other Non-Metallic Mineral	22-23
9	Basic Metals, Fabricated Metal	24-25
10	Electrical Equipment	26-27
11	Machinery, Equipment	28
12	Transport Equipment	29-30
13	Other Manufacturing	31-33
14	Electricity, Gas, Water Supply	D-E
15	Construction	F
16	Trade & Repair of Motor Vehicles	45

17	Wholesale Trade	46
18	Retail Trade	47
19	Transport and Storage	49-52
20	Postal and Courier	53
21	Accommodation, Food	I
22	Publishing, Media Services	58-60
23	Telecommunications	61
24	IT and Other Information Services	62-63
25	Financial and Insurance Activities	K
27	Professional, Scientific, Technical, Admin. & Support Service	M-N
31	Arts, Entertainment	R-S

Chart A.1. Network Effects of TFP Growth among Different Countries