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AN EMPIRICAL STUDY OF THE TRANSMISSION CHANNELS FROM FINANCIAL DEVELOPMENT TO ECONOMIC GROWTH IN RUSSIA

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OUTLINE

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1. Finance and the Channels to Economic Growth
2. Data, Methodology, and Model Specification
3. Results and Discussion

FINANCE AND THE CHANNELS TO ECONOMIC GROWTH

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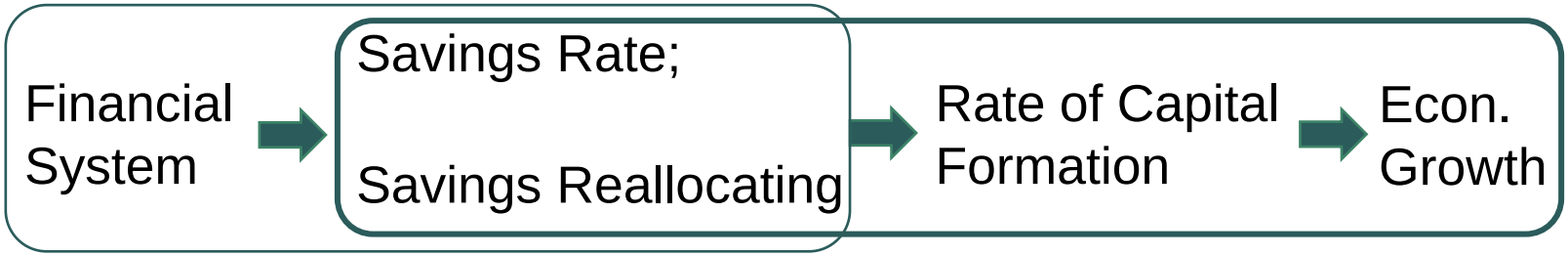
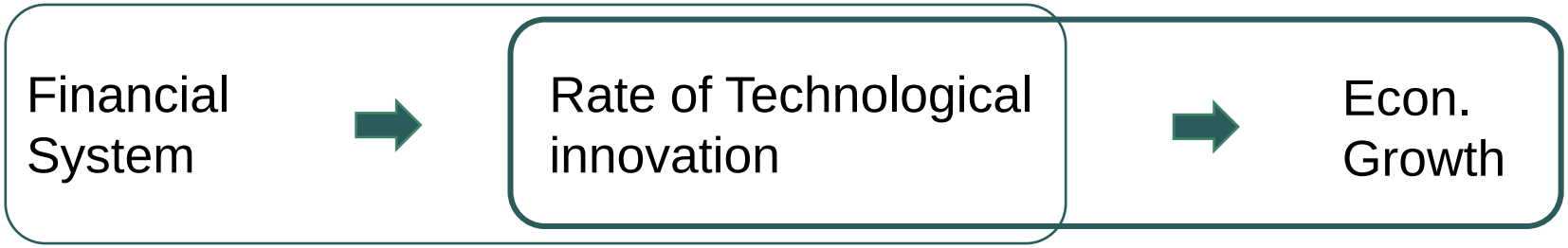
Romer (1986); Lucas (1988); Rebelo (1991); Levine (1997):

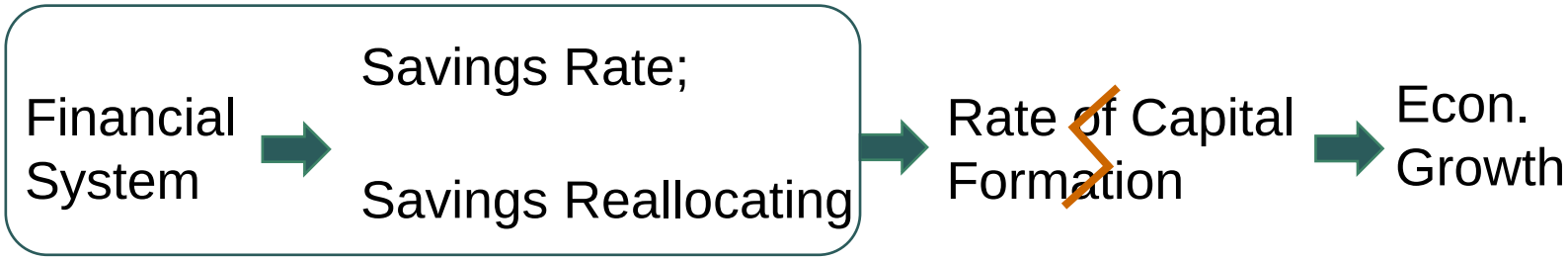


Romer (1990); Grossman & Helpman (1991); Aghion & Howitt (1992); Levine (1997):



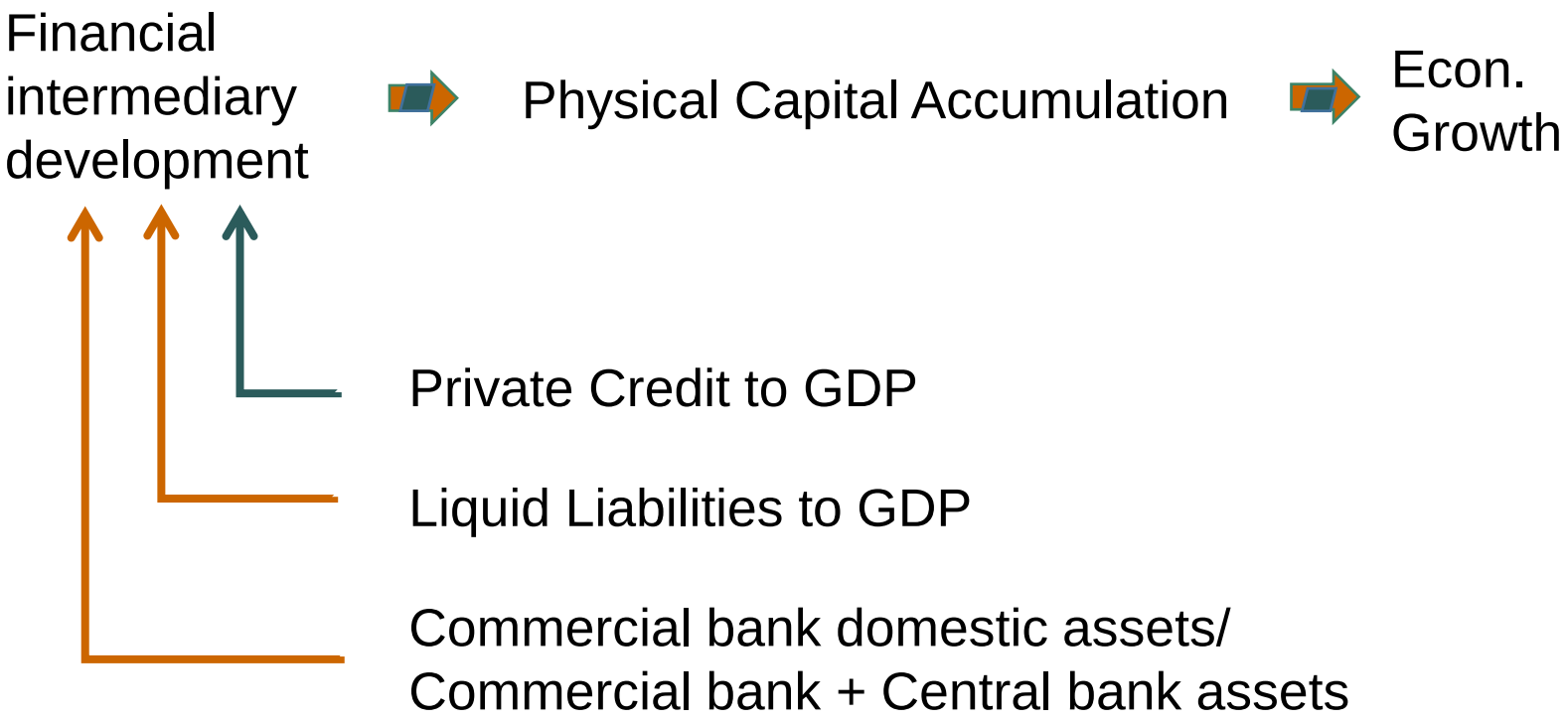
FINANCE AND THE CHANNELS TO ECONOMIC GROWTH

Levine & Zervos (1998); Beck, Levine, & Loayza (2000); Wachtel (2003), etc.:



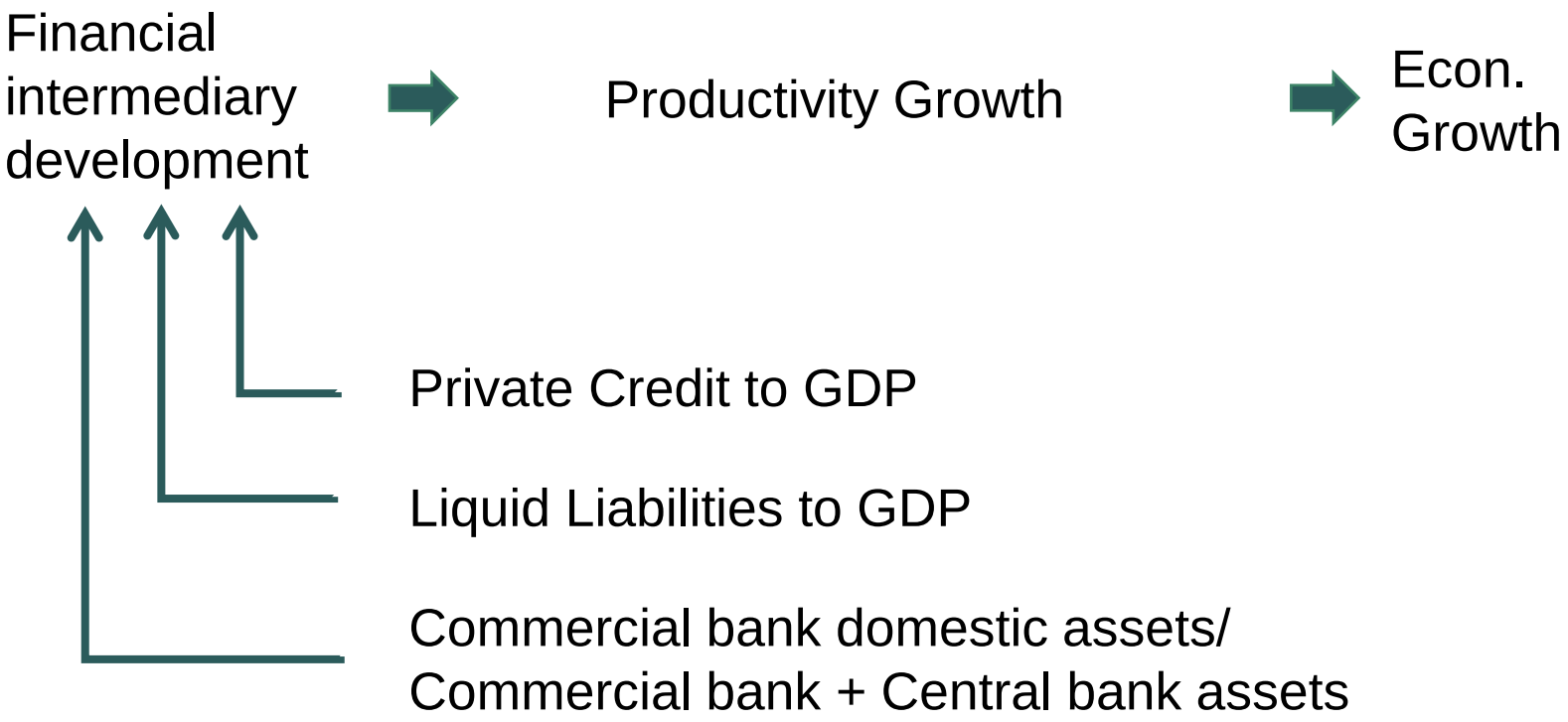
FINANCE AND THE CHANNELS TO ECONOMIC GROWTH

Beck, Levine, & Loayza (2000):



FINANCE AND THE CHANNELS TO ECONOMIC GROWTH

Beck, Levine, & Loayza (2000); Love (2003):



THE TFP GROWTH CHANNEL

Schumpeter (1912), Theil (2001):

Allocative decisions

Banks' informational advantage

Role of stock and financial derivatives markets

→ Productivity Growth → Econ. Growth

↑ Bank-based metrics & Market-based metrics

THE TFP GROWTH CHANNEL

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The TFP Growth Channel

Innovation

Ayyagari, Demirgüç-Kunt, and Maksimovic (2007), etc.: Access to external finance matters to innovation

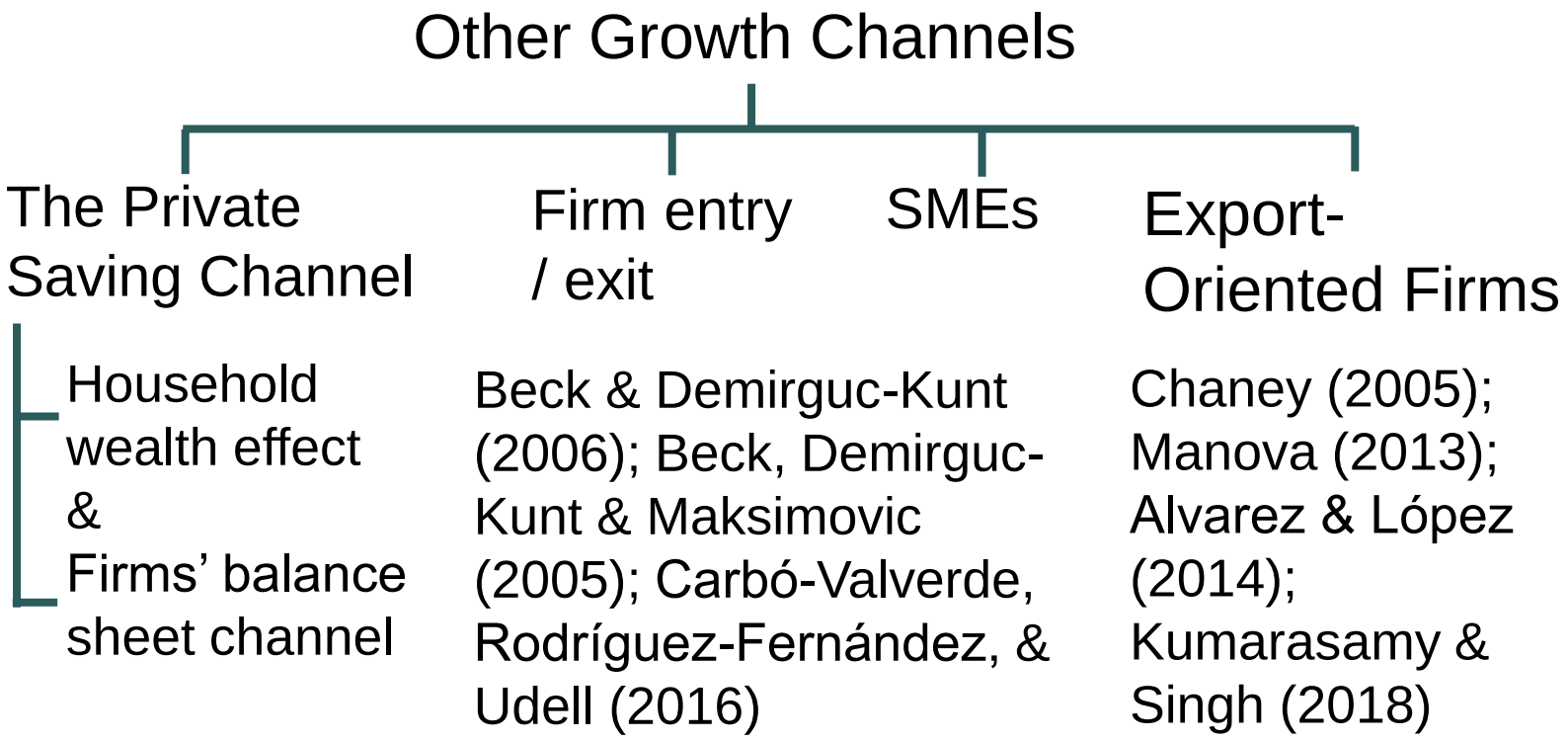
Equilibrium size

Beck, Demirgüç-Kunt, and Maksimovic (2005), Klapper, Laeven, and Rajan (2006), etc.: Eliminating external financial constraints allows firms to achieve a larger equilibrium size

Risk mitigation

Levine (1997), etc.: Financial markets and institutions make trading, hedging, and pooling of risk easier, so firms might undertake less liquid, high-return projects

OTHER GROWTH CHANNELS



THE TFP GROWTH CHANNEL

Acemoglu et al. (2002):

Financial development may affect productivity and capital accumulation in different ways in industrial versus developing countries

Rioja & Valev (2004):

Finance has a strong positive influence on productivity growth primarily in more developed economies.

In less developed economies, the effect of finance on output growth occurs primarily through capital accumulation

(74 countries; GMM dynamic panel techniques)

DATA, METHODOLOGY, AND MODEL SPECIFICATION

Data:

- 75 regions of Russia, 2008 – 2015
- Federal State Statistics Service

  http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/accounts
- Bank of Russia

  http://www.cbr.ru/eng/region/olap

Method:

- System GMM (Arellano & Bond (1991, 1998); Arellano & Bover (1995); Blundell & Bond (1998))

DATA, METHODOLOGY, AND MODEL SPECIFICATION

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Model specification:

$$\Delta R\_GDPpc\_gr_{it} = \alpha + \gamma_1 \Delta GDPpc\_gr_{it-1} + \gamma_2 \Delta GDPpc\_gr_{it-2} +$$
$$+\beta_1 \Delta Init\_GDPpc_{it} + \beta_2 \Delta Educ_{it} + \beta_3 \Delta Gov\_GDP_{it} + \beta_4 \Delta Ex\_GDP_{it} +$$
$$+\beta_5 \Delta CPI_{it} + \lambda \Delta Loans\_GDP_{it} + \nu_t + \Delta\varepsilon_{it} \qquad \Delta x_t = x_t - x_{t-1}$$

R_GDPpc_gr — Real regional GDP per capita (growth rate);

Init_GDPpc — Log of initial regional GDP per capita;

Educ — Log of workers with an associate degree or higher (percent of the workforce);

Gov_GDP — Log of Government expenditure (regional authorities) to regional GDP ratio;

Ex_GDP — Log of Export to regional GDP ratio;

CPI — the Log of Consumer price index;

Loans_GDP — Log of Loans granted to legal entities by credit institutions to regional GDP ratio

DATA, METHODOLOGY, AND MODEL SPECIFICATION

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Three stage strategy:

1. FG nexus model
2. Adding the conditioning information by an investment measure
3. Adding two multiplicative variables to control the working of transmission channels

DATA, METHODOLOGY, AND MODEL SPECIFICATION

Growth rate of productivity per capita (King, Levine, 1993; Beck et al., 2000; Rioja & Valev 2004):

$$Prod = Growth - 0.3*Cap\_growth,$$

Growth — the rate of real per capita GDP growth;

Cap_growth — the growth rate of the per capita physical capital stock

RESULTS AND DISCUSSION

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	Model 1	Model 2	Model 3
Bank loans to regional GDP ratio	0.027** (0.019)	0.026** (0.023)	0.003 (0.678)
Regional Investment per capita	–	0.017* (0.072)	–
Bank loans to regional GDP ratio x Gross fixed capital formation growth rate	–	–	0.103*** (0.006)
Bank loans to regional GDP ratio x TFP	–	–	0.748*** (0.000)
Initial GDP per capita	–0.017 (0.658)	–0.017 (0.651)	–0.010 (0.684)
Workers with an associate's degree or higher	0.319 (0.416)	0.288 (0.474)	0.090 (0.774)
Government expenditure to regional GDP ratio	–0.065* (0.057)	–0.066** (0.050)	–0.049* (0.066)
Export to regional GDP ratio	–0.011** (0.014)	–0.011** (0.024)	–0.009*** (0.007)
CPI	–0.279 (0.268)	–0.328 (0.223)	–0.075 (0.633)
AR (2)	1.063 (0.288)	1.222 (0.222)	0.438 (0.661)

Two-step estimator. Robust standard errors. P-value are in parentheses.

*** p <0.01, ** p <0.05, * p <0.1

ROBUSTNESS CHECK

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	Model 4	Model 5	Model 6
Bank loans to regional GDP ratio	0.028** (0.020)	0.026** (0.027)	0.004 (0.655)
Regional Investment per capita	–	0.018 (0.284)	–
Bank loans to regional GDP ratio x Gross fixed capital formation growth rate	–	–	0.103*** (0.006)
Bank loans to regional GDP ratio x TFP	–	–	0.728*** (0.000)
Initial GDP per capita	–0.014 (0.679)	–0.014 (0.676)	0.015 (0.596)
Workers with a bachelor's degree or higher	–0.043 (0.289)	–0.041 (0.327)	–0.039 (0.156)
Government expenditure to regional GDP ratio	–0.068** (0.041)	–0.066** (0.039)	–0.057* (0.054)
Export to regional GDP ratio	–0.011*** (0.007)	–0.010** (0.019)	–0.009** (0.011)
CPI	–0.279 (0.228)	–0.305 (0.209)	–0.102 (0.460)
AR (2)	1.023 (0.307)	1.053 (0.293)	0.433 (0.665)

Two-step estimator. Robust standard errors. P-value are in parentheses.

*** p <0.01, ** p <0.05, * p <0.1

ROBUSTNESS CHECK

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	Model 7	Model 8	Model 9
Bank loans to regional GDP ratio	0.028** (0.047)	0.027** (0.027)	0.004 (0.618)
Regional Investment per capita	–	0.019 (0.233)	–
Bank loans to regional GDP ratio x Gross fixed capital formation growth rate	–	–	0.117*** (0.003)
Bank loans to regional GDP ratio x TFP	–	–	0.747*** (0.000)
Initial GDP per capita	–0.039 (0.602)	–0.033 (0.398)	0.002 (0.936)
Workers with an associate's degree or higher	0.344 (0.622)	–0.345 (0.404)	0.084 (0.796)
Government expenditure to regional GDP ratio	–0.067* (0.094)	–0.065* (0.068)	–0.050* (0.099)
External trade to regional GDP ratio	–0.279 (0.228)	–0.305 (0.209)	–0.102 (0.460)
CPI	–0.297 (0.540)	–0.340 (0.221)	–0.089 (0.611)
AR (2)	0.771 (0.441)	0.799 (0.424)	0.350 (0.726)

Two-step estimator. Robust standard errors. P-value are in parentheses.

*** p <0.01, ** p <0.05, * p <0.1

ROBUSTNESS CHECK

	Model 10	Model 11	Model 12
Bank loans to regional GDP ratio	0.026** (0.021)	0.024** (0.039)	0.001 (0.886)
Regional Investment per capita	–	0.030** (0.046)	–
Bank loans to regional GDP ratio x Gross fixed capital formation growth rate	–	–	0.096*** (0.007)
Bank loans to regional GDP ratio x TFP	–	–	0.802*** (0.000)
Initial GDP per capita	–0.017 (0.670)	–0.018 (0.610)	0.017 (0.532)
Workers with an associate's degree or higher	0.317 (0.425)	0.275 (0.491)	0.073 (0.817)
Government expenditure to regional GDP ratio	–0.067** (0.044)	–0.078** (0.016)	–0.038 (0.116)
Export to regional GDP ratio	–0.011** (0.013)	–0.009** (0.043)	–0.009*** (0.008)
CPI	–0.273 (0.276)	–0.283 (0.266)	–0.114 (0.478)
Population growth rate	0.007 (0.770)	0.037 (0.205)	–0.059 (0.254)
AR (2)	1.070 (0.285)	1.145 (0.252)	0.651 (0.515)

Two-step estimator. Robust standard errors. P-value are in parentheses.

*** p <0.01, ** p <0.05, * p <0.1

CONCLUSION

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1. The TFP channel brings more to the regional economic output in Russia than the capital accumulation channel.
2. This result supports the findings presented by Beck et al. (2000) and Rioja and Valevs' (2004).
3. They can be reasonably explained by referring to some features of the current Russian pattern, including structural characteristics of the Russian economy.

REFERECES

1. Acemoglu, D., Aghion, P., & Zilibotti, F. (2002). Distance to frontier, selection, and economic growth, NBER Working Paper No 9066, Cambridge MA.
2. Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies, 58, 277 – 297.
3. Arellano, M., & Bond, S. (1998). Dynamic panel data estimation using DPD98 for GAUSS: a guide for users. London, U.K.: Institute for Fiscal Studies, Mimeo.
4. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of Econometrics, 68, 29-51.
5. Awounang, D. (2017). The Transmission Channels from Financial Development to Economic Growth: An Empirical Analysis in the CEMAC Zone. Journal of Economics and Sustainable Development, 8 (16), 104 – 114.
6. Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic V. (2007). Firm Innovation in Emerging Markets: Role of Governance and Finance. Policy Research Working Paper 4157, World Bank, Washington, DC.

REFERECES

7. Beck, T., & Demirguc-Kunt, A. (2006). Small and medium-size enterprises: Access to finance as a growth constraint. Journal of Banking & Finance, 30(11), 2931 – 2943.
8. Beck, T., Demirguc-Kunt, A., & Maksimovic, V. (2005). Financial and Legal Constraints to Firm Growth: Does Firm Size Matter? Journal of Finance. 60(1), 137 – 177.
9. Beck T., Levine R., & Loayza, N. (2000). Finance and the sources of growth. Journal of Financial Economics, 58 (1), 261 – 300.
10. Blundell, R. & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87(1), 115 – 143.
11. Carbó-Valverde, S., Rodríguez-Fernández, F. & Udell. G.F. (2016). Trade Credit, the Financial Crisis, and SME Access to Finance. Journal of Money, Credit and Banking, 18 (1), 114 – 143.
12. Chaney, T. (2005). Liquidity constrained exporters. Working paper, University of Chicago.

REFERECES

13. Ciccone, A., & Papaioannou E. (2010). Estimating Cross-Industry Cross-Country Models Using Benchmark Industry Characteristics, CEPR Discussion Paper No. 8056.
14. Fisman, R., & Love V. (2007). Financial Dependence and Growth Revisited. Journal of the European Economic Association, 5(2–3), 470 – 479.
15. Krinichansky, K.V. (2018). Non-Monotonic Impact of Financial Development on Economic Dynamics in the Russian Regions. Region: Ekonomika i Sociologiya, 1, 52 – 68.
16. Krinichansky, K., & Fat'kin, A. (2018). Studying the «vanishing effect» of the impact of financial development on economic growth: From the cross-country to the subnational scale. Applied Econometrics, 51, 33 – 57.
17. Krinichansky, K., & Sergi B.S. (2019). Financial Development and Economic Growth in Russia. In "Modeling Economic Growth in Contemporary Russia" by Bruno S. Sergi (ed.). Emerald Publishing.

REFERECES

18. Kumarasamy, D., & Singh, P. (2018). Access to Finance, Financial Development and Firm Ability to Export: Experience from Asia–Pacific Countries. Asian Economic Journal, 32(1), 15 – 38.
19. Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature, 35, 688 – 726. a
20. Love, I. (2003). Financial Development and Financing Constraints: International Evidence from the Structural Investment Model. Review of Financial Studies, 16(3), 765 – 791.
21. Marconi, D., & Upper, C. (2017). Capital misallocation and financial development: A sector-level analysis. BIS Working Papers. No 671.
22. Ono, S. (2017). Financial development and economic growth nexus in Russia. Russian Journal of Economics, 3, 321 – 332.
23. Rioja, F., & Valev, N. (2004). Finance and the Sources of Growth at the Various Stages of Economic Development. Economic Inquiry, 42 (1), 127 – 140.

REFERECES

24. Schumpeter, J. A., 1934 (2008). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle, translated from the German by Redvers Opie. New Brunswick, U.S.A and London, U.K.: Transaction Publishers.
25. Thiel, M. (2001). Finance and economic growth – a review of theory and the available evidence. European Economy - Economic Papers 2008 - 2015, 158, Directorate General Economic and Financial Affairs (DG ECFIN), European Commission.
26. Wurgler, J. (2000). Financial Markets and the Allocation of Capital. Journal of Financial Economics, 58(1-2), 187 – 214.

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