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Comment on: Dynamical Feedbacks between Population Growth and Sociopolitical Instability in Agrarian States by Peter Turchin

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The discovery of demographic cycles as a basic feature of complex agrarian systems' dynamics, to my mind, represents one of the most important recent findings in the study of the long-term dynamic social processes. The presence of political-demographic cycles in the pre-modern history of Europe and China has been known for quite a long time (e.g., Postan 1950, 1973; Abel 1974, 1980; Le Roy Ladurie 1974; Hodder 1978; Braudel 1973; Chao 1986; Cameron 1989; Goldstone 1991; Kul'pin 1990; Mugruzin 1994 etc.), and already in the 1980s mathematical models of demographic cycles, at various levels of formalization, started to be produced, the first being that for Chinese "dynastic cycles" (Usher 1989). At the moment we have a very considerable number of such models (Chu and Lee 1994; Malkov and Sergeev 2001, 2002, 2004; Malkov *et al.* 2002; Malkov 2002; Turchin 2003; Nefedov 2002; 2004).[1]

Turchin's article achieves a significant progress in this field, suggesting an extremely simple model accounting for an unusually high percentage of the political-demographic variation. What is more, it accounts for some features for which the earlier models failed to account. The most developed model of pre-industrial demographic cycle at the moment, for example, was suggested by Nefedov (2004). In Nefedov's model, however, the recovery phase of the demographic cycle starts immediately after the demographic collapse, whereas this is never observed in reality. Recovery phases always turn out to be separated from those of collapse by significant periods of internal warfare that blocks recovery growth (see, e.g., Korotayev, Malkov, and Khaltourina 2005: 178–228). The latter, called intercycles, which are systematically observed in the agrarian political-demographic dynamics, represent a problem that Turchin has managed to solve in a very elegant and compelling way.

Bibliography

Abel, W. 1974. *Massenarmut und Hungerkrisen im vorindustriellen Europa. Versuch einer Synopsis*. Hamburg: Parey.
—. 1980. *Agricultural Fluctuations in Europe from the Thirteenth to the Twentieth Centuries*. New York, NY: St. Martin's.

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[1] There are also a significant number of pre-industrial population dynamic models designed to account for "the escape from Malthusian Trap," rather than for the structure of pre-industrial population cycles (Artzrouni and Komlos 1985; Steinmann and Komlos 1988; Komlos and Artzrouni 1990; Steinmann, Prskawetz, and Feichtinger 1998; Wood 1998; Kögel and Prskawetz 2001; Komlos and Nefedov 2002).

Artzrouni, M., and J. Komlos. 1985. Population Growth through History and the Escape from Malthusian Trap: A Homeostatic Simulation Model. *Genus* 41: 21–39.

Braudel, F. 1973. *Capitalism and Material Life, 1400–1800.* New York, NY: Harper and Row.

Cameron R. 1989. *A Concise Economic History of World*. New York, NY: Oxford University Press.

Chao, K. 1986. *Man and Land in Chinese History. An Economic Analysis*. Stanford: Stanford University Press.

Chu, C. Y. C., and R. D. Lee. 1994. Famine, Revolt, and the Dynastic Cycle: Population Dynamics in Historic China. *Journal of Population Economics* 7:351–78.

Goldstone, J. A. 1991. *Revolution and Rebellion in the Early Modern World*. Berkeley, CA: University of California Press.

Hodder, I. 1978. Simulation in Population Studies. In *Simulation Studies in Archeology*, edited by I. Hodder, pp. 59–62. Cambridge, UK: Cambridge University Press.

Kögel, T., and A. Prskawetz. 2001. Agricultural Productivity Growth and Escape from the Malthusian Trap. *Journal of Economic Growth* 6:337–57.

Komlos, J. and M. Artzrouni. 1990. Mathematical Investigations of the Escape from the Malthusian Trap. *Mathematical Population Studies* 2:269–87.

Komlos, J., and S. Nefedov. 2002. A Compact Macromodel of Pre-Industrial Population Growth. *Historical Methods* 35:92–4.

Korotayev, A. V., A. S. Malkov, and D. A. Khaltourina. 2005. *Laws of History: Mathematical Modeling of Historical Macrodynamics (Demography, Economy, Wars).* Moscow: URSS.

Kul'pin, E. S. 1990. *People and Nature in China*. Moscow: Nauka (in Russian).

Le Roy Ladurie, E. 1974. *The Peasants of Languedoc*. Urbana, IL: University of Illinois Press.

Malkov, S. Ju. 2002. Mathematic Modeling of Historical Processes. In *Novoe v sinergetike: Vzgljad v tret'e tysjacheletie*, edited by G. G. Malinetskij and S. P. Kurdjumov, pp. 291–323. Moscow: Nauka (in Russian).

Malkov, S. Ju., and A. V. Sergeev. 2001. Model of Economic-Demographic Processes in Agrarian Society. *Matematika. Komp'juter. Obrazovanie* 9: 267 (in Russian).

—. 2002. Mathematical Modeling of Socio-Economic Stability of a Developing Society. *Strategicheskaja stabil'nost'* 4: 54–61.

—. 2004. Mathematic Modeling of Economic-Demographic Processes in Agrarian Society. *Matematicheskoe modelirovanie* 16 (in Russian, forthcoming).

Malkov, S. Ju., Ju. V. Kosse, V. N. Bakulin, and A. V. Sergeev. 2002. Socio-Economic and Demographic Dynamics in Agrarian Societies. *Matematicheskoe modelirovanie* 14(9):103–8 (in Russian).

Mugruzin, A. S. 1994. *Agrarian and Peasant Problems of China.* Moscow: Nauka (in Russian).

Nefedov, S. A. 2002. Mathematical Modeling of Demographic Cycle. *Istorija i komp'juter* 29: 131–42 (in Russian).

—. 2004. A Model of Demographic Cycles in Traditional Societies: The Case of Ancient China. *Social Evolution & History* 3(1): 69–80.

Postan, M. M. 1950. Same Economic Evidence of Declining Population in the Later Middle Ages. *Economic History Review.* 2nd ser. 2:130–67.

—. 1973. *Essays on Medieval Agriculture and General Problems of the Medieval Economy*. Cambridge: Cambridge University Press.

Steinmann, G., and J. Komlos. 1998. Population Growth and Economic Development in the Very Long Run: A Simulation Model of Three Revolutions. *Mathematical Social Sciences* 16:49–63.

Steinmann, G., A. Prskawetz, and G. Feichtinger 1998. A Model on the Escape from the Malthusian Trap. *Journal of Population Economics* 11: 535–50.

Turchin, P. 2003. *Historical Dynamics: Why States Rise and Fall*. Princeton: Princeton University Press.

Usher, D. 1989. The Dynastic Cycle and the Stationary State. *The American Economic Review* 79:1031–44.

Wood, J. W. 1998. A Theory of Preindustrial Population Dynamics: Demography, Economy, and Well-Being in Malthusian Systems. *Current Anthropology* 39: 99–135.