Reply to Brendan Beare

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A REPLY TO: BRENDAN K. BEARE, "THE SOVIET ECONOMIC DECLINE REVISITED," *ECON JOURNAL WATCH* 5(2), MAY 2008: 135-144. Link

ABSTRACT

WE ARE GRATEFUL TO BEARE (2008) FOR THE VALUABLE SERVICE OF RE-checking our old results (Easterly and Fischer 1995). Beare's main point is correct: we made a careless error in constraining the intercept of the time trend to be constant while allowing trend coefficients to vary across decades. The consequence of this constant intercept assumption was not that our estimated equation produced crazy jumps at the end of each decade, as Beare's Figure 1 might be taken to imply. It was instead that we biased the trend coefficients to be equal across decades (as Beare recognizes soon after Figure 1). So we gave biased support to our story that the slowdown in Soviet growth was *not* because of slowing TFP growth but rather was because of the extensive growth strategy of reliance on capital accumulation with a sharply falling rate of return to capital caused by a very low elasticity of substitution between capital and labor.

Of course, while we failed to do a fair test of the assumption of constant TFP growth, the assumption could still be correct. Our parsimonious model of a nearly constant TFP growth rate and low elasticity of substitution DID fit the data very well with sensible parameter values (except perhaps for our very high capital share, although even that could reflect a situation of initial surplus labor in a non-market economy).

Unfortunately, the corrected model provided by Beare does not provide a very clear verdict on whether our story was correct or not. It would be desirable to relax

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our rigid assumptions so as to be able to test the alternative hypothesis of fluctuating and/or declining TFP growth and a higher elasticity of substitution in a completely unconstrained model. However, as Beare implicitly notes, it may be overly ambitious to estimate a fully flexible spline regression over time combined with a nonlinear function of capital with only 38 observations, which may not provide enough information content to allow sharp nested tests in a completely unconstrained model.

Indeed, in Beare's piecewise continuous time trend using the CIA data, he finds that he can reject that TFP growth rate is equal across decades, but he cannot reject that the capital share is zero, and he cannot pin down the elasticity of substitution anywhere between zero and one. Beare's 95% confidence interval for the capital share is {-0.724, 1.824} and that for the elasticity of substitution is {-0.7788, 2.2788}. In his results, we do not know whether capital has a positive (or negative) effect on output in any time period, whether capital and labor have zero substitutability or such high substitutability that labor is not even necessary in the long run (the latter would have made extensive growth very feasible). Hence, Beare is not able to go from his finding of decelerating TFP growth to also refute our story that stressed the low elasticity of substitution and sharply declining marginal product of capital as the downfall of the extensive growth strategy.

We tried a more parsimonious specification of the TFP trend which turned out to allow us to still precisely estimate the capital share and the elasticity of substitution. This was simply specifying a quadratic function of time for the TFP element. The results were as follows:

Model with Trend and Squared Trend:
ln(Y)=C1+C2*T+C3*T^2+gamma/(gamma-1)*ln(alpha*K^(gamma-1)/gamma+(1-alpha))

Parameter	Estimate	T-Stat
C1	-0.3844	-4.11
C2	0.0243	3.08
C3	-0.0003	-2.85
alpha (capital share)	0.83	11.45
gamma (elasticity of substitution)	0.49	7.56

The coefficient on the squared trend is significant and negative, indicating that we were wrong on constant TFP growth—TFP growth did decelerate.[3] Since this exercise was inspired by Beare's criticism, we are grateful to Beare for correcting the part of the story that implied constant TFP growth. However, the elasticity of substitution is still very low, indicating that there were also sharply di-

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3 The turning point of the quadratic function of time is slightly beyond the sample period, indicating that TFP growth fell to close to zero but never became negative.

minishing returns to capital accumulation under "extensive growth". This affirms our main point—the Soviet growth collapse was due in part to a rigid economy that did not allow much substitution of labor with capital. As labor scarcities developed, the extensive growth strategy was doomed.

In addition, Beare's comment leads to the further conclusion that the rate of technical progress declined over the course of the history of the former Soviet Union—a result that we regard as very plausible, and which we thank Beare for pointing out as also being implied by the data.

REFERENCES

Beare, Brendan K. 2008. The Soviet Economic Decline Revisited. *Econ Journal Watch* 5(2): 134-144. Link.

Easterly, William and Stanley Fischer. 1995. The Soviet Economic Decline. *World Bank Economic Review* 9(3): 341-371.

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