

## Review of

### ***Damien Challet, Sorin Solomon, Gur Yaari. The Universal Shape of Economic Recession and Recovery after a Shock***

Vladimir Popov, New Economic School, Moscow

The paper deals with an issue that (to the best of my knowledge) was not analyzed in the literature previously – the specific pattern of the trajectory that characterizes the dynamics of output during the recession (caused by a shock) and subsequent recovery. Here is how the authors describe the main idea.

“... We take the position that after a dramatic change in the economy, the very same process responsible for the recovery is already at work in the recession...”

...The main idea is that following dramatic events, large sectors previously dominating the economy start fading away while previously undeveloped sectors take over; grouping all the growing sectors on the one hand and all the fading ones on the other hand, the recession-recovery process is then completely determined by the value of the returns for the two aggregate sectors and the transfer rate of economic activity between them” (p.2).

The equation that fits the data best is claimed to be the one which is intuitively quite natural: it presents total output as the sum of two sectors – one (constituting the share  $f$  of total output) that is growing at a constant rate  $\lambda_+$  and the other  $(1-f)$  that is contracting at a constant rate  $\lambda_-$ :

$$W(t) = W(t_0)[f e^{\lambda_+(t-t_0)} + (1-f)e^{\lambda_-(t-t_0)}]; \quad (1)$$

where

$W(t_0)$  is the initial GDP at the time  $t_0$  of the reform,

$f$  is the fraction of the economy that grows at rate  $\lambda_+$ ;

the rest of the economy  $(1-f)$  contracts at rate  $\lambda_-$ .

Finding appropriate parameters  $f$ ,  $\lambda_+$  and  $\lambda_-$ , it is possible to approximate a variety of J-, U- or L-shaped curves – and the authors get very good results approximating output change in many

countries using annual data. They claim this to be the general pattern of every recession and recovery, following the initial shock, no matter what was the type of the shock. I would argue that this analysis is applicable only to particular type of recessions/recoveries and this is where my comments could perhaps be useful.

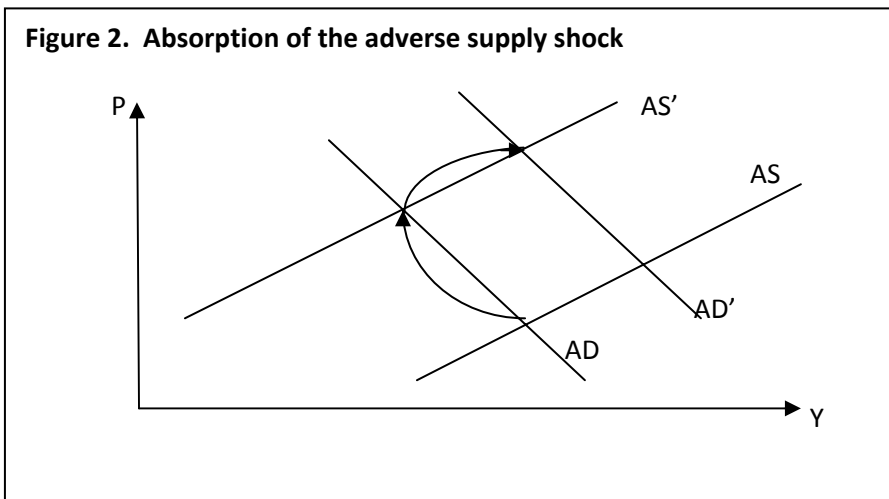
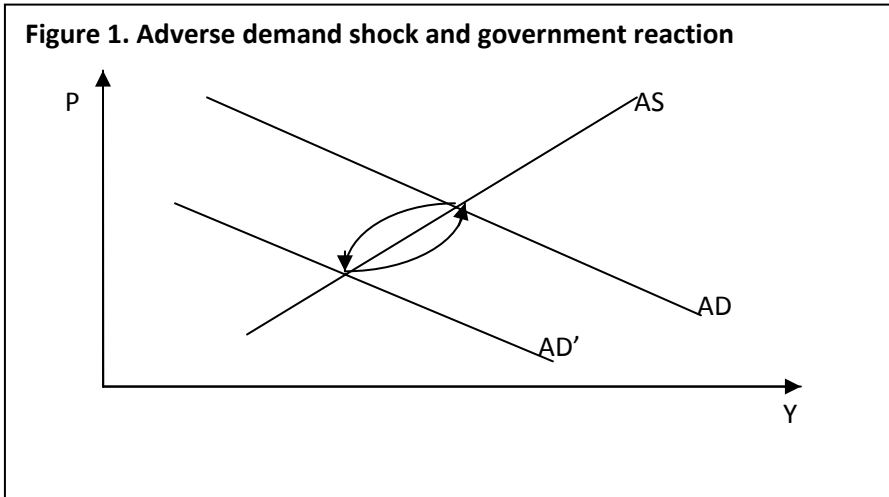
### **Typology of recessions**

Economists distinguish between supply-side and demand-side recessions, the former being caused by the supply shocks, the latter – by demand shocks. The framework is the AS-AD model (Mankiw, 2006), the AS curve characterizes positive relationship between output and prices (the higher the prices, the larger the supply of goods), whereas AD curve characterizes the negative relationship between the demand for goods and prices. The demand is the *aggregate* demand; it could be increased (AD moves to the right) by the expansionary fiscal and monetary policy. The supply is the aggregate supply; in the long run the AS curve is vertical (given full utilization of production capacities and labor and the level of productivity), but in the short run AS curve is positively sloped (firms respond to growing prices by expanding output and employment, but eventually this causes wages to increase, so costs catch up with growing prices and output returns to the equilibrium level).

The negative demand shock occurs, when there is a decline in the demand for the country's export, or when investors decide to cut spending on new projects, or when consumers decide to save more and buy less – the AD curve moves to the left, as shown on figure 1 below. Luckily, the government and the central bank can respond to the shock by expansionary fiscal and monetary policy, and can return the AD curve back at its initial position. There is an agreement among economists that the Great Depression of the 1930s was caused by the demand factors (the debate is whether it was poor monetary or fiscal policy that failed to put back the AD curve).

The supply shock occurs when costs increase – either the workers ask for higher wages or fuel producers abroad increase prices for fuel that is imported into the country, or the bridge collapses due to an earthquake. The AS curve then moves to the left (adverse supply shock), and the government does not have the powers to affect its position in the short run. The only thing

the authorities could do to restore output is to absorb the supply shock by increasing aggregate demand (moving the AD curve to the right, restoring output at a cost of higher prices – fig. 2).



Structural recession – the one that is caused by the decline of one (non-competitive) sector and the rise of another (competitive) sector – would not be a recession at all, if the transfer of resources (capital and labor) from the first sector to the second sector would be instant and effortless. But in reality such a transfer of resources is associated with higher costs (retraining of employees, replacement of fixed capital stock), so the structural recession (whatever the reasons are – supply side or demand side) becomes a typical supply-side recession.

This is not to say, however, that all supply side recessions are structural. Imagine that workers ask for higher wages in all regions and industries, so that profits contract by the same amount in all companies, so they fire employees and cut output. When unemployment grows, real wages fall, profits increase and output is gradually restored to the previous level. We have a supply-side recession and a recovery without the reallocation of capital and labor from one sector (industry, region) to another.

This is true with respect to demand side recessions as well. There may be a fall in demand for the products of particular industry and then there is a need to reallocate resources from this industry to the other sectors. But one could imagine a demand-driven recession, caused by absolutely even contraction of demand for all products (say, due to the excess tightening of monetary policy) – in this case we have a temporary decline in output (and prices) that comes to an end as wages fall and the previous profit rate is restored at the new (lower) level of prices and wages.

So, there may be recessions, supply-driven and demand-driven, not associated with the need to reallocate resources between sectors. The important difference between these “structural” and “general” recessions is that in the latter case there is no need to reallocate resources, so there is no need for new investment. First, universal across industries contraction of output occurs, so that there is unemployment and unloaded production capacities; later, during recovery, employment and capacity utilization rates increase universally across industries.

It may be expected that such a “general” recession (unlike the “structural” one) is best described by the equation that does not involve two sectors, like equation (1), so that perhaps a simple parabola (that implies that rates of decline are equal to the rates of recovery) approximates the data better. I leave it to the authors to figure out the exact form of the equation for the “general” recession. If they manage to do it, and to register different shapes of recession-recovery process for “structural” and “general” recessions, it should be possible to see what particular recessions in what particular countries were of “structural” and “general” nature. (Of course every recession is a mixture of the two, but it should be possible to isolate the “structural” and

“general” components in the *de facto* trajectories of decline and recovery of output. This in turn opens for door for the recession diagnostics, which could potentially become a pretty big area of research.

For instance, it is known that recessions in post-communist countries were mostly structural supply side – due to changes in relative prices after deregulation (Popov, 2007). But the appropriate (inappropriate) government policies could have eased (aggravated) this structural recession. Thus, it has been argued, for instance, that the impact of demand-side factors (excessively tight demand management) on output decline in Poland has been much more pronounced than the impact of supply-side factors (Rosati, 1994).

For non- (former) communist countries, the same question – whether the recession is supply-side or demand-side – is of course of major importance as well. If the former, an increase in inflation rate may be warranted (to absorb the adverse supply shock); if the latter, the good policy would be to stick to the pre-recession inflation rates.

### **Optimal speed of transfer of resources from non-competitive to competitive sector**

The authors claim that “assuming fixed transfer rate, a head of state of a country about to convert from communism to capitalism may be able to choose between a small but long recession with anemic final growth, or a large but short-lasting recession with large final growth (Fig. 5). A cynical politician would ensure that the wealth of the majority of voters has increased by the end of his tenure or at least that the recovery has begun” (p.11).

As I argued in the paper that the authors cite (Popov, 2007), there are objective constraints for the transfer of resources from one sector to the other, in particular the size of savings and investment that could be used to reallocate capital.

Consider a country where deregulation of prices (or elimination of trade tariffs/subsidies) leads to a change in relative price ratios and thus produces an adverse supply shock for at least some

industries. Capital should be reallocated from industries facing declining relative prices and profitability to industries with rising relative prices. Assume that 50% of the total output is concentrated in non-competitive industries: this whole sector should disappear either gradually or at once depending on how fast relative prices will change; capital is not homogeneous and cannot be moved to the competitive sector, whereas labor (for the sake of the argument) can be reallocated to the competitive sector without costs.

If prices are liberalized instantly, then the whole non-competitive sector becomes unprofitable overnight and output falls immediately by 50%; later savings for investment are generated only by the competitive sector, so it takes a number of years to reach the pre-recession level of output. If reforms are carried out slowly (gradual price deregulation or elimination of tariffs/subsidies), so that every year output in the non-competitive sector falls by, say, 10%, this fall could be largely compensated by the increase in output in the competitive sector. *The best trajectory, of course, is the one with such a speed of deregulation that leads to the reduction of output in the non-competitive sector at a natural rate, i.e. as its fixed capital stock retires in the absence of new investment.*

The example illustrates that there is a limit to the speed of reallocating capital from non-competitive to competitive industries, which is determined basically by the net investment/GDP ratio (gross investment minus retirement of capital stock in the competitive industries, since in non-competitive industries the retiring capital stock should not be replaced anyway). It is not reasonable to wipe away output in non-competitive industries faster than capital is being transferred to more efficient industries.

Market type reforms in many post-communist economies created exactly this kind of a bottleneck. Countries that followed shock therapy path found themselves in a supply-side recession that is likely to become a textbook example: an excessive speed of change in relative prices required the magnitude of restructuring that was simply non-achievable with the limited pool of investment. Up to half of their economies was made non-competitive overnight due to the change in relative prices after deregulation. Output in these non-competitive industries was

falling for several years and fell in some cases to virtually zero, whereas the growth of output in competitive industries was constrained, among other factors, by the limited investment potential and was not strong enough to compensate for the output loss in the inefficient sectors.

Hence, at least one general conclusion from the study of the experience of transition economies appears to be relevant for the reform process in all countries: *provided that reforms create a need for restructuring (reallocation of resources), the speed of reforms should be such that the magnitude of required restructuring does not exceed the investment potential of the economy.* In short, the speed of adjustment and restructuring in every economy is limited, if only due to the limited investment potential needed to reallocate capital stock. This is the main rationale for gradual, rather than instant, phasing out of tariff and non-tariff barriers, of subsidies and other forms of government support of particular sectors (it took nearly 10 years for the European Economic Community and for NAFTA to abolish tariffs).

The authors seem to recognize this constraint:

“...one of the most important results of this paper is the existence of an optimal policy and the considerable speed at which the economic transfer rate should decrease; in practice however, there is a maximal speed of transition, due for instance to human workforce transfer between sectors (Balcerowicz 1994; Popov 2006), which may prevent from applying the optimal policy” (p. 15).

But they still insist that the optimal rate can be determined without taking this constraint into consideration. I would say, the realistic optimal path is the one that forces the non-competitive enterprises to cut output exactly in line with the pace at which resources from these enterprises (capital and labor) are transferred to the competitive sector. That is to say the optimal path of transfer of resources is determined by the rates of natural retirement of fixed capital stock in non-competitive industries.

\*

\*

\*

To conclude, the paper can perhaps open the new area of research – recession-recovery diagnostics. There were attempts to use the spectral analysis for studying business cycles – to distinguish between the periodic fluctuations with different frequency (length of waves). However, the assumption behind this analysis (that waves tend to reproduce themselves) may be not that realistic.

The analysis of differences in trajectories of output dynamics after initial shock could potentially reveal some important irregularities (symptoms) that can be attributed to the specific reasons/shocks (causes).

## **References**

Mankiw, N. Gregory (2006). *Macroeconomics*, Sixth edition.

Popov, Vladimir (2007), "Shock Therapy versus Gradualism Reconsidered: Lessons from Transition Economies after 15 Years of Reforms". - *Comparative Economic Studies*, Vol. 49, Issue 1, March 2007, pp. 1-31.

Rosati, Dariusz K. (1994), "Output Decline during Transition from Plan to Market: A Reconsideration". *Economics of Transition*, 2 (4): 419-41, 1994.