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ECONOMIC CRISIS AND GLOBAL SUPPLY CHAINS

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NON-TECHNICAL SUMMARY

The global crisis that originated in the U.S. subprime mortgage market in August 2007 has spread across the world and resulted in an abrupt fall in exports all over the world. During the last quarter of 2008, the value of exports decreased by 18 percent in Germany, 20 percent in the United States, 25 percent in France up to 32 percent in China. For the full year of 2009, world trade is expected to fall significantly. Forecasts vary from -9 percent (WTO forecast of March 2009) to -16.0 percent (OECD forecast of June 2009) whereas world output is expected to decline by "only" 1.3 (IMF, April 2009), or 2.2 percent (OECD, June 2009). Trade is hence expected to fall by more than GDP.

Four sets of explanations for this larger fall of trade compared to GDP have been proposed: i) credit restrictions and the rise in perceived risks (that are detrimental to "risky" activities such as international trade); ii) the rise of protectionism; iii) transmission channels in the real economy (a synchronised drop in activity in the OECD and a significant drop in the relative price of traded goods, especially oil); iv) new patterns of the international division of labour characterised by global supply chains.

According to the latter explanation, production in many sectors involves the same component being exchanged several times – and thus registered as 'trade' several times – before it is incorporated into the final product. A relatively low drop in world GDP could therefore be consistent with a much larger reduction in world trade. This argument based on a multiplier effect is challenged in this paper.

Through simple accounting, we firstly show that fragmented supply chains are consistent with world trade reacting proportionally to a fall in world GDP, under simplifying assumptions. In order to generalise this result, a fully consistent framework taking into account actual inter-industrial relations within and across countries is needed, and we mobilise a multi-country, multi-sectoral computable general equilibrium model (MIRAGE). There are considerable advantages to such approach. The trade-growth nexus very much depends on the respective openness and specialisation of the various regions in the world – two key features of such models. Interestingly, all simplifying assumptions of our simple accounting can then be relaxed.

In particular, the model fully takes into account inter-industry relations between 25 sectors and 18 regions of the world economy, using the specific inter-industrial relations observed in each modelled country. Interestingly, we not only take into account inter-industry imports (e.g. the car industry importing glass); we also account for own-imports of each industry (e.g. the car industry importing car components).

We introduce in MIRAGE the April 2009, IMF forecasts for the GDP and the oil price over 2009-2012. We also simulate a shift in demand away from capital goods, based on the shifts observed during the past business cycles. Lastly, we impose a halt to the long-run trend of declining trade costs, although we do not introduce a rise in tariff and non-tariff barriers.

Our simulation firstly stresses the role of relative prices in the apparent over-reaction of trade to GDP. When correcting nominal trade with GDP prices, we find that trade largely overshoots GDP during the crisis: in 2009, trade declines by 8.9 percent, for a 1.3 percent drop in world GDP. However, the fall in the oil price accounts for roughly 5 percentage points of this total. On the contrary, deflating each trade flow by its specific price leads to a much smaller falls in world trade (–2.4%). The remaining gap disappears if, like trade flows, GDPs are aggregated using current exchange rates rather than purchasing power parities: our 2.4% drop in world trade is now similar to the 2.6% drop in world GDP. All in all, and this is our main result, trade no longer overshoots GDP when the trade and growth nexus is properly modelled using a general equilibrium framework accounting for all input-output relations.

To obtain the double-digit figures recorded in the last quarter of 2008 and first quarter of 2009, one firstly has to factor in short-run effects such as inventory contraction, the reversal of expectations or the shortage of trade and consumption finance. Also, the shift in demand away from durable goods is certainly steeper than during the previous business cycles due to the credit crisis in general. Finally, the collapse of the car industry, already suffered from overcapacities before the crisis and its collapse has played a major role in global trade contraction.