FIW-Research Reports 2010/11 N° 06
April 2011

Policy Note

Austrian Linkages to the European Economy and the Transmission Mechanisms of Economic Crisis

Joseph Francois, Mario Holzner, Olga Pindyuk

Abstract

Like most of the global economy, Austria suffered from recession in 2008-2009. In this paper we deconstruct the pattern of recession, and the transmission of the global recession to Austria's economy. We provide a new a new breakdown of the value added in Austrian exports, tracing both upstream and downstream linkages and their role in the recession. We also employ a multi-region computable general equilibrium (CGE) model, focused on Austria and its major trading partners. We estimate the combined impacts of the crisis, as implemented through stylized shocks to investment and household demand across major trading partners. These are based on the actual global demand shocks that occurred in 2008-2009. As we are focused on recession, we work with a short-run version of the model, where labor markers are modeled with unemployment and sticky wages, and where industry structure (number of varieties and allocation of capital stock across industries) is fixed. We introduce demand shocks (changes) to global investment demand calibrated from actual investment demand changes during the recession. We also calibrate output shocks based on actual changes in GDP in this period. The focus on backward and forward linkages provides new insight into the transmission channels for focused demand shocks at the border into more diffuse shocks within the broader Austrian economy. While the drop in global demand during the recent recession was focused on sectors producing heavy investment goods, the actual pressure this placed on the Austrian economy also hinged on the linkages of these sectors to other elements of the Austrian economy.

Keywords: economic crisis, transmission mechanisms, Austria, Europe, CGE

JEL-codes: F14, F44, F47, C68

The FIW-Research Reports 2010/11 present the results of six thematic work packages "The financial and economic crisis of 2007-2010 and the European economy", "Modelling the Effects of Trade Policy and the Transmission Mechanisms of the Economic Crisis on the Austrian Economy", "The Gravity Equation", "Macroeconomic Aspects of European Integration", "Effects of International Integration on Income Distribution" and "New Energy Policy and Security of Gas Supply", that were announced by the Austrian Federal Ministry of Economics, Family and Youth (BMWFJ) within the framework of the "Research Centre International Economics" (FIW) in January 2010.

Policy Brief

Trade and the Transmission of Crisis

Austrian Linkages to the European Economy and the Transmission Mechanisms of Economic Crisis

Authors[*]**:** Joseph Francois, Johannes Kepler University, Linz; wiiw
Mario Holzner, wiiw
Olga Pindyuk, wiiw

Financing of the study: The study was commissioned by the Austrian Federal Ministry of Economy, Family and Youth (BMWFJ) within the scope of the Research Centre International Economics (FIW) and funded out of the Austrian Federal Government´s "Internationalisation Drive".

February 2011

This brief summarizes a recent study that quantifies trade-related transmission mechanisms that helped translate the global drop in investment demand and output into local recession in Austria. The study provides a new breakdown of the value added in Austrian exports, tracing both upstream and downstream linkages. It also employs a multi-region computable general equilibrium (CGE) model, focused on Austria and its major trading partners, that enables estimation of the overall impacts of the crisis in terms of global shocks to investment and household demand across major trading partners. To examine recession, the study works with a short-run version of the model, with demand shocks (changes) to global investment demand based on actual investment demand changes from 2007-2009. The study also includes global output shocks based on actual changes in GDP from 2007-2009.

The focus on backward and forward linkages provides new insight into the transmission channels for focused demand shocks at the border into more diffuse shocks within the broader Austrian economy. While the drop in global demand during the recent recession was focused on sectors producing heavy investment goods, the actual pressure this placed on the Austrian economy also hinged on the linkages of these

[*] J. Francois, M. Holzner, and O. Pindyuk (2010), "Austrian Linkages to the European Economy and the Transmission Mechanisms of Economic Crisis," a study commissioned by the Austrian Federal Ministry of Economy, Family and Youth (BMWFJ) within the scope of the Research Centre International Economics (FIW) and funded out of the Austrian Federal Government´s "Internationalisation Drive", wiiw: Vienna.

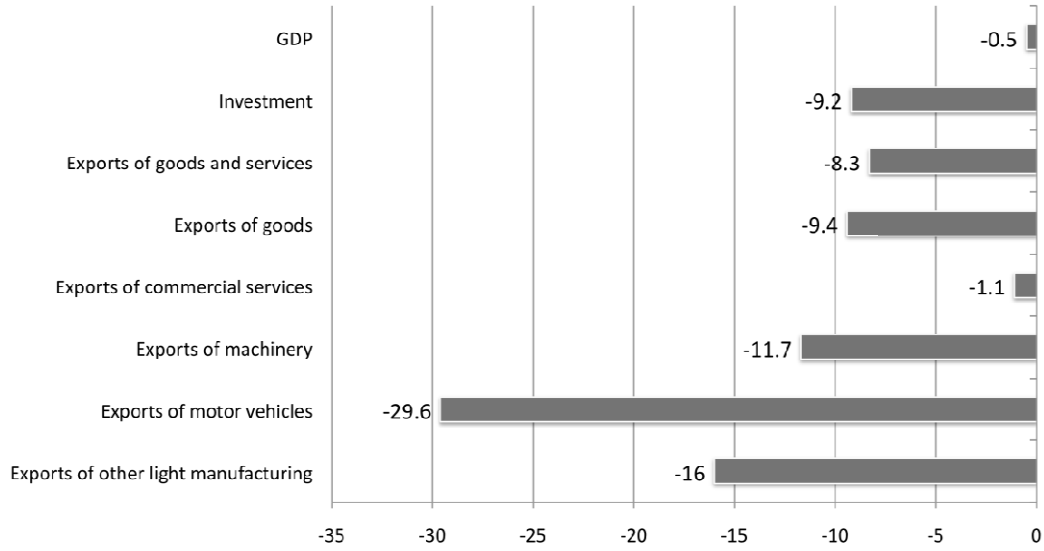
sectors to other elements of the Austrian economy. On a value added basis, drop for demand in heavy industrial sectors placed negative pressure on services less exposed to the direct vagaries of the world economy. This is because the Austrian value added in these sectors includes a substantial share of producer services (IT, professional services, finance, and other business services). Indeed, in general a great deal of the value added contained in Austrian manufacturing exports comes from service inputs. As such, though the recession featured a disproportionate drop in global demand for heavy industrial and investment goods, in the Austrian context demand shocks in goods ultimately placed pressure on producer services as well.

1. Global Patterns of Recession

Figure 1 presents cumulative changes in the economic indicators for the world economy in 2008-2009. During this period, annual global GDP decreased by 0.5%. The economic decline was dominated by a fall in investment of 9.2%, in response to the collapse in financial markets and a general loss in investor confidence. The fall in merchandise exports was of a similar scope as that of investment, while services exports turned out to be more resilient to crisis, possibly reflecting lower elasticity of demand and the counter-cyclical nature of certain services (such as auditing, consultancy, legal services, repair services, technical assistance to governments). Reflecting the financial nature of the original crisis, the greatest trade declines were in durables and investment demand commodities. Indeed, exports fell by almost 30% in the case of motor vehicles.

Figure 1

Global Economy Macroeconomic Indicators,
% change 2008-2009 (from 2007 levels)



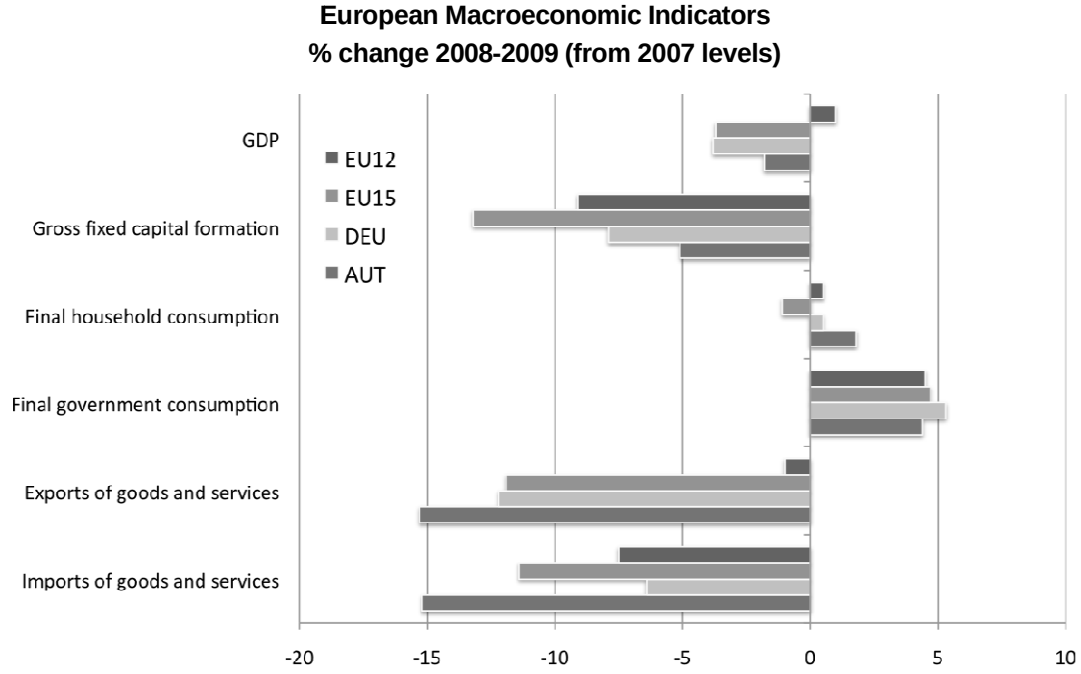
Source: IMF and World Trade Organization, 2010

2. The Pattern of Recession in Europe and Austria

Figure 2 shows changes in major macroeconomic indicators for Austria and its European trading partners during the recession. While it did not avoid recession, the Austrian economy performed better than many of the EU15. Its GDP during 2008-2009 fell cumulatively by 1.8%, which was a full 2 percentage points smaller than the decline in GDP of its major trading partner Germany. It was also 1.9 percentage points smaller than the average decline across the EU15. Though a heterogeneous group, the new EU Member States (important trading partners for Austria), actually had small but positive cumulative growth over the same period.

Similar to the global trends, the decline of Austria's GDP was driven by the investment collapse. Investment as measured by gross fixed capital formation fell during 2008-2009 by 5.1%, which was again lower than in Germany or on average in the EU. It is remarkable, that final household consumption growth was positive in Austria, and significantly higher than in Germany or the EU12, which also had resilient domestic markets. However, Austria performed much worse than the other EU members in terms of exports, the decline of which was 15.3%, around 3 percentage points greater than in Germany or the rest of the EU15.

Figure 2

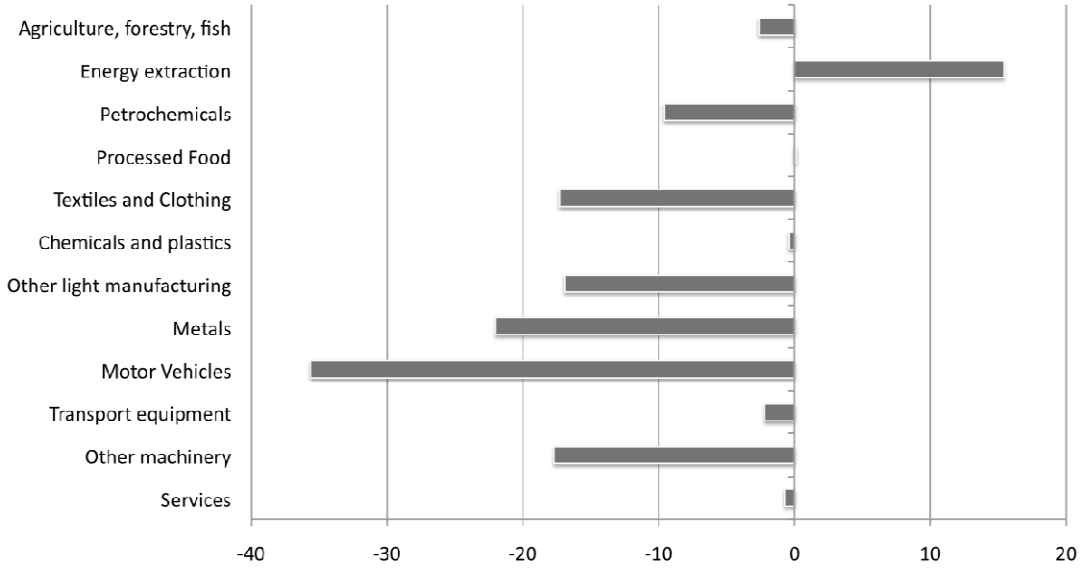


Source: EUROSTAT 2010.

The biggest contribution to Austria's exports decline was made by Austria's major exports sectors, i.e., motor vehicles, other machinery, and other light manufacturing (see Figure 3). These changes are in line with the global exports trends.

Figure 3

Cumulative change of annual exports by sectors
% change 2008-2009 (from 2007 levels)



Source: EUROSTAT 2010.

3. Transmission of the Crisis through Trade

The drop in Austrian exports followed from the impact of the financial crisis on demand in major trading partners. Figure 4 presents the geographic spread of the fall in Austrian exports during the crisis. In terms of geographic structure, Germany and the rest of EU15 accounted for the greater share of Austria's decline in exports. At the same time, the decrease in exports to the EU12 roughly matched the decline of exports to Germany (-13.1% vs. -13.3%). Exports to the USA and Japan, which account for relatively small shares of Austrian exports, were reduced by almost one third. A striking counter development has been the increase in the exports to China by 27.4% over the same period.

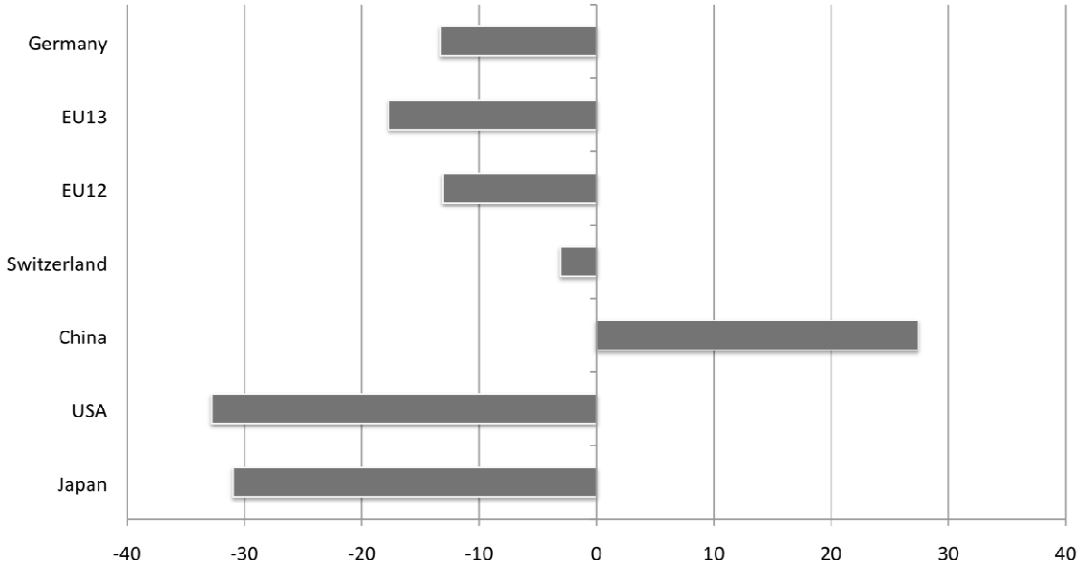
To trace how the recession abroad and the consequent drop in export demand contributed to the pattern of recession in Austria, a multi-region computable general equilibrium (CGE) model has been used to quantify the impact of both investment and output shocks abroad (as shown in Figures 1 and 2) on Austria. The model has been constructed to focus on Austria and its major trading partners, and is an extension of the model used to examine medium-run global trends and their impact on Austria.[1] To examine recession, the study works with a short-run version of the model, with demand shocks (changes) to global

[1] E. Christie, J. Francois, M. Holzner, S. Leitner, O. Pindyuk (2009), "AUSTRIA 2020: The impact of medium-term global trends on the Austrian economy," a study commissioned by the Austrian Federal Ministry of Economy, Family and Youth (BMWFJ) within the scope of the Research Centre International Economics (FIW) and funded out of the Internationalisation Program "go international," wiiw: Vienna.

investment demand based on actual investment demand changes in 2008-2009 from a 2007 benchmark. The study also includes global output shocks based on actual changes in GDP from 2008-2009 from the same 2007 benchmark.

Figure 4

Cumulative change of annual mechandise exports by trading partners, % change 2008-2009 (from 2007 levels)



Source: UNCTAD COMTRADE.

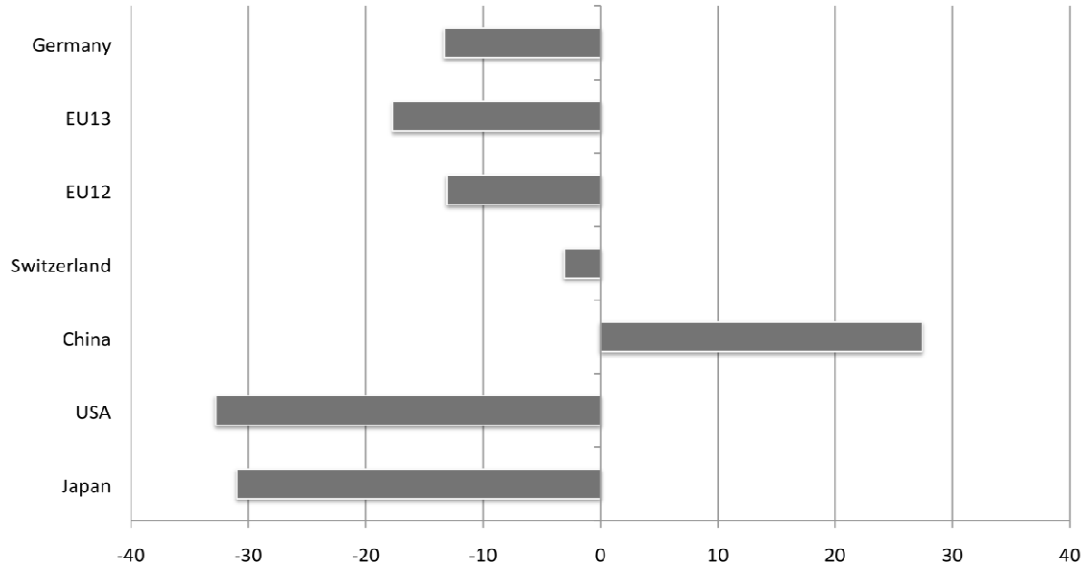
Figure 5 presents a decomposition of the marginal impact of the global recession in total, and for major trading partners, on Austria. Among trading partners, the "old" EU Members EU13 (EU15 without Austria and Germany) contributed the most to Austria's decline in GDP during the recession. Interestingly, though Germany carries the same weight as the rest of the EU15 combined, in terms of Austrian trade, its negative impact was softer. This may be because of the shaper drop in investment in the EU13 as compared to Germany. The "new" EU Members actually moderated the blow of the global recession on Austria's economy, with a marginal impact close to zero on GDP.

The study also examines the impact of global drops in demand by sector on the Austrian economy. This provides an alternative to the regional decomposition in Figure 5. Viewed in this way, model-based estimates suggest that the greatest sectoral impact on the Austrian economy was the global drop in demand for machinery which was precipitated by the fall in investment demand. Indeed the impact of the fall in machinery demand on Austrian production for export was so severe that it alone, is sufficient to produce the observed real decline in Austria's GDP in 2008-2009 from 2007 levels. The global drop in demand for motor vehicles, again reflecting the drop in investment expenditure (and the global drop in household demand for durables), reinforced the negative impact linked to

global machinery demand. At the same time, the less dramatic drop in global demand for services implied a more moderate impact on the Austrian economy. On a sector basis, the sharp drop in global demand for heavy manufacturing, rather than a drop in services, was the dominant force in driving the pattern of recession in Austria.

Figure 5

Cumulative change of annual mechandise exports by trading partners, % change 2008-2009 (from 2007 levels)

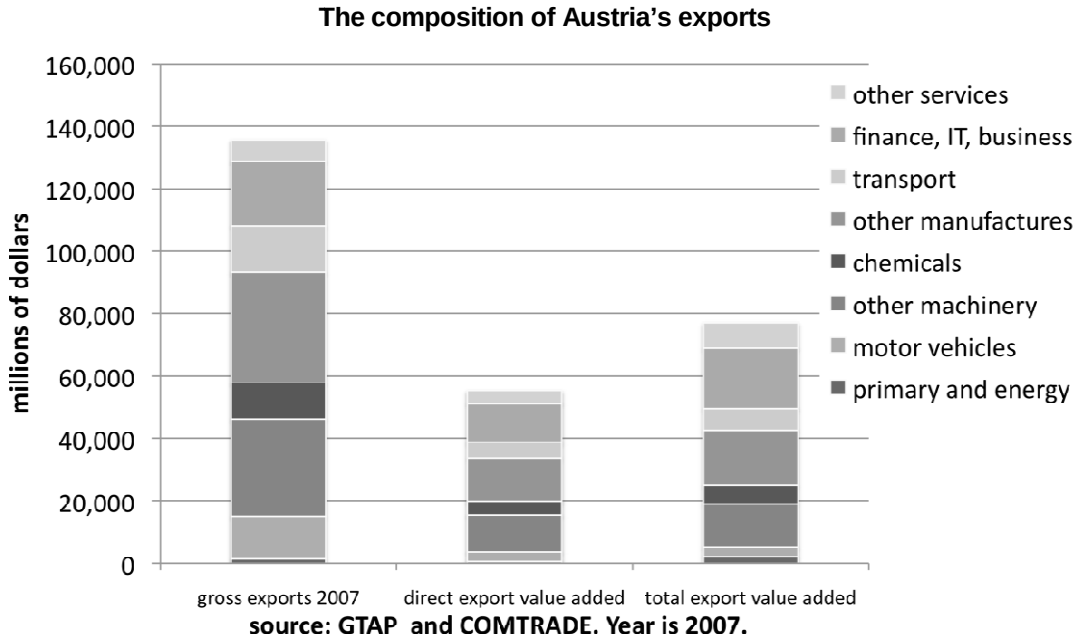


Source: CGE model estimates.

Next, turning to labour markets, the estimated fall in the demand for highly skilled labour in Austria given the global recession outpaces the rate of GDP decline for all the sectors. The most dramatic fall occurs due to the machinery sector. In addition, it is estimated that the recession placed more negative pressure on the demand for less skilled labour (i.e. demand fell faster) than on the demand for more highly skilled labour.

A great deal of the value added contained in Austrian manufacturing exports comes from service inputs. This is shown Figure 5. Hence, while the drop in global demand was very strongly focused on the sectors producing heavy investment goods, the actual pressure this placed on the Austrian economy also hinged on the linkages of these sectors to other elements of the Austrian economy. On a value added basis, drop for demand in heavy industrial sectors ultimately placed negative pressure on sectors less exposed to the direct vagaries of the world economy. This is because Austrian value added in goods exports includes a substantial share of Austrian producer services (IT, professional services, finance, and other business services). As such, though the recession featured a disproportionate drop in global demand for heavy industrial and investment goods, in the Austrian context this ultimately placed pressure on producer services as well.

Figure 6



Source: EUROSTAT 2010.

The impact pattern of the recession also points to possible channels for recovery. Because recession in the EU13 had a more negative impact on Austria than recession in Germany did, eventual recovery in the EU13 is also likely to contribute more to restoring Austria to its healthier medium-term growth path than continued recovery in Germany. In addition, consistent with the earlier Austria 2020 study, continued growth in Asia has also proven important to moderating the degree of recession and to prospects for medium-term growth.[2] In addition, we can expect to see the producer service sector benefit from renewed health in goods exports.

[2] E. Christie et al (2009), op cit.