



Harald Stieber

**Sensitivity analysis in the 2005
*update of the Austrian Stability
Programme***

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Abstract:

A small macroeconomic model of the Austrian economy is simulated over the medium term until the year 2015. On the basis of these simulations we have build a medium term scenario of the Austrian economy that incorporates the short term WIFO economic forecast for the years 2005 and 2006 (WIFO 2005) and the information about the government budget for these years (BMF 2005). The medium term scenario then serves as a baseline for an extensive sensitivity analysis. We report the results from simulations of a simple demand shock, a monetary shock, and of two different shocks to the terms of trade. We also report some econometric evidence on the increased role of recycling of oil revenues in the light of the strong increase in price for crude oil in the years 2004 and 2005.

JEL-Classification: E62, E47

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Zusammenfassung und Kernaussagen

Laut Code of Conduct (politische Vereinbarung bezüglich Format und Inhalt der Stabilitäts- und Konvergenzprogramme) müssen Mitgliedstaaten der Europäischen Union in ihren Programmen eine Sensitivitätsanalyse durchführen, die verschiedene Risiken für den Wachstums- und den Budgetpfad im Programmzeitraum quantifiziert. Die Hauptergebnisse dieser Analyse wurden in Kapitel 4 der Fortschreibung des Österreichischen Stabilitätsprogramms für die Jahre 2005-2008 vom November 2005 wiedergegeben. Sie bestätigen die starke Abhängigkeit der österreichischen Volkswirtschaft von Nachfrage- und Preisentwicklungen in anderen Volkswirtschaften. Das vorliegende Papier beschreibt im Detail die Wirkungsweise der simulierten Schocks.

Die Kernaussagen dieser Analyse lauten:

- Ein standardisierter temporärer negativer Schock entweder des Wachstums der Exportmärkte oder der Terms of Trade resultiert in zirka 1 Prozentpunkt niedrigerem Wachstum im Jahr des Schocks.
- Terms of Trade Schocks haben eine höhere Wahrscheinlichkeit stark auszufallen, wenn sie auf Preisentwicklungen in Österreichs Exportmärkten zurückgehen, die Standardabweichung solcher Schocks ist um 60-70% größer als jene der Importpreise.
- Die direkten negativen Zinsrisiken sind vernachlässigbar gering und dürften darüber hinaus in vielen Fällen durch positive Terms of Trade Entwicklungen überkompensiert werden.
- Positive direkte Zinsrisiken sind vorhanden, sie sind jedoch klein im Vergleich zu den Risiken, die mit dem Wachstum der Exportmärkte verknüpft sind.
- Die beiden letzteren Ergebnisse könnten eine gewisse Erklärung dafür geben, warum sich Mitgliedstaaten mit kleinen offenen Volkswirtschaften als die *owner* des Stabilitäts- und Wachstumspaktes erwiesen haben, viel mehr als es für die großen Staaten der Fall war, und warum das voraussichtlich so bleiben wird.
- Ökonometrische Analysen weisen darauf hin, dass ein höheres Ausmaß an Recycling der zusätzlichen Einkünfte aus dem Verkauf von Öl die negativen Wachstumseffekte des aktuellen Erdölpreishochs abgefedert haben könnte.

Summary and key messages

According to the opinion on the content and format of stability and convergence programmes Member States are requested to include an analysis in their stability and convergence programmes that quantifies various risks for the envisaged growth performance and budgetary outcomes over the programme horizon. This main results of this analysis were reported in chapter 4 of the November 2005 update of the Austrian Stability Programme for the period 2005-2008. The analysis, which is explained in this paper in more detail, exemplifies the high degree of dependence of the Austrian economy on demand and price developments in other economies.

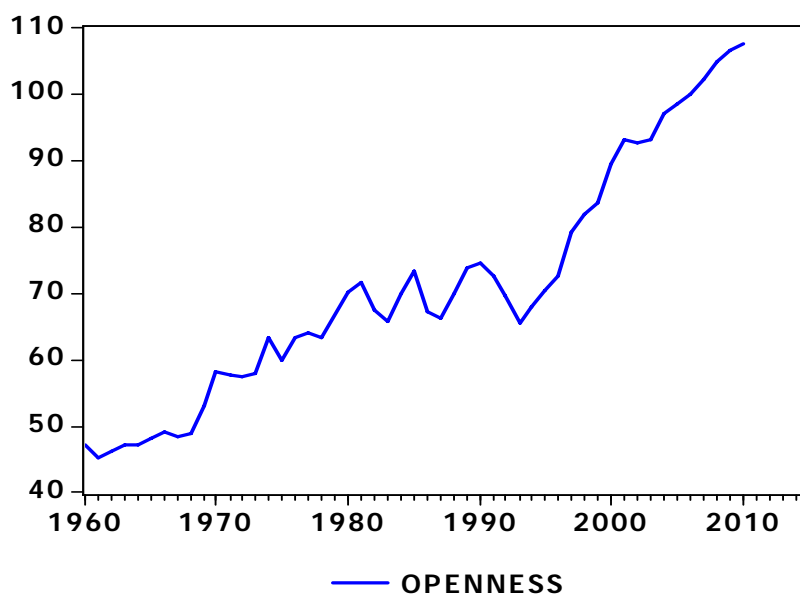
Key messages coming out of the analysis:

- A standardised temporary negative shock to either growth of export markets or terms of trade lowers economic growth in the year of the shock by roughly 1 percentage point.
- Terms of trade shocks are more likely to be large when they originate from price developments in Austrian exports markets; the standard deviation of these shocks is 60-70% bigger than the standard deviation of import prices.
- Direct negative interest rate risks are negligible and should in many cases be more than compensated by positive terms of trade developments.
- Positive direct interest rate risks exist, but they are small compared to risks connected to growth of export markets.
- The latter two results go some way in explaining why small open economy member states owned the Stability and Growth Pact so far more than large member states, and why they are likely to continue to do so.
- We find some econometric evidence that a higher degree of recycling could have helped to cushion the negative effects on growth of the recent hike in oil prices.

1. Introduction

A small macroeconomic model of the Austrian economy is simulated over the medium term until the year 2015. On the basis of these simulations we have build a medium term scenario of the Austrian economy that incorporates the short term WIFO economic forecast for the years 2005 and 2006 (WIFO 2005) and the information about the government budget for these years (BMF 2005). The medium term scenario then serves as a baseline for an extensive sensitivity analysis.

The analysis highlight the high degree of dependence of the Austrian economy on demand and price developments in other economies. Furthermore, it has to be stressed, that this degree of dependence constitutes a lower bound of what we esteem to be the actual degree of dependence over the time horizon of the present update of the Austrian Stability Programme for the period 2005 to 2008, since it is derived from parameters of a model, that has been estimated with data from 1976 to 2004¹. During this period the integration of the Austrian economy increased in terms of openness (figure 1), in geographic terms (opening up of the Eastern European economies), and, last but not least in terms of fiscal integration (first Stability and Growth Pact from 1997 on, reformed SGP from 2005). On the other hand, compared to these types of integration, monetary integration has known little variation, due to the quasi monetary union with Germany starting in 1981 (Hochreiter and Winckler 1995).



Openness is calculated as the sum of exports and imports as a share of GDP in %
Source: BMF (2005), Stieber (2006)

Figure 1

¹ In order to assess the robustness of the estimated relationship, we also used linked data series going back as far as 1960. More on this is reported in Stieber (2006).

2. Description of the data and the model used

In the 30 years between 1977 and 2006² the Austrian economy exhibits an average growth of 2.3% (this is both the mean and the median value of the real GDP series). This and other descriptive statistics are summed up in table 1. Whenever possible, data were taken from the Austrian national accounts as compiled by Statistics Austria (2005).³

	1977-1986	1987-1996	1997-2006	1977-2006
<i>endogenous variables:</i>				
GDP growth	2.2	2.7	2.1	2.3
Private consumption	2.2	2.7	1.5	2.2
Government consumption	2.1	2.2	1.2	1.9
Investment	1.1	3.6	1.8	2.2
Exports	4.4	4.9	6.6	5.4
Imports	3.1	5.3	5.3	4.6
Inflation	4.5	2.7	1.6	2.9
Deflator exports	3.5	1.0	0.8	1.8
<i>exogenous variables:</i>				
Price level in export markets	2.5	-0.1	1.2	1.2
Growth of relevant export markets	3.8	5.8	7.8	5.8
Real interest rates (long term, in %)	3.9	4.8	3.4	4.0
Price level imports	4.1	1.1	0.8	2.0

Source: Stieber (2006)

Table 1

Comparing the 3 decades in the estimation sample from a macroeconomic perspective,⁴ one fact stands out: Only in the last decade the average growth of the deflator of Austrian exports was lower than the average change in the price level in Austria's export markets (table 1). It is at this point that Austrian exports "take off", whereas import growth remains roughly the same. This is covering up the fact that export driven imports increased while internal demand and investment related imports decreased. Of course, this is one part of a larger story which comes under the heading of European economic integration. But still, depending on its ability to compete, an economy may win or lose from increased economic integration in the short to medium run, and the more so the slower its price system adjusts to the new situation. Thus,

² Throughout the paper we include the most recent short term economic forecast of the Austrian Institute of Economic Research (WIFO) for the years 2005 and 2006 (WIFO 2005).

³ Statistics Austria publishes nominal figures ($p \cdot x$) and an index of the respective volume series (I_x). From this deflators (p) are recovered. During the estimation and testing of the model we also used series from the OECD Economic Outlook Analytical Database, from DG Ecfm's AMECO database. One of the robustness checks included estimating the model with data over various time span, going back as far as 1960. The results were encouraging.

⁴ Bearing in mind that the Austrian economy is very dependent on exogenous supply and demand conditions, as well as exogenous price and interest rate developments.

