

## **Banks, Financial Markets and International Consumption Risk Sharing**

Leibrecht, Markus; Scharler, Johann

*DOI:*

[10.57938/b329f051-1225-4050-a228-07f61bedb005](https://doi.org/10.57938/b329f051-1225-4050-a228-07f61bedb005)

Published: 01/01/2009

*Document Version*

Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for published version (APA):*

Leibrecht, M., & Scharler, J. (2009). *Banks, Financial Markets and International Consumption Risk Sharing*. Department of Economics, WU Vienna University of Economics and Business. Department of Economics Working Paper Series No. 128 <https://doi.org/10.57938/b329f051-1225-4050-a228-07f61bedb005>

## Banks, Financial Markets and International Consumption Risk Sharing\*

Markus Leibrecht<sup>†</sup>, Johann Scharler<sup>‡</sup>

Working Paper No. 128, May 2009

**Abstract** — *In this paper we empirically explore how characteristics of the domestic financial system influence the international allocation of consumption risk using a sample of OECD countries. Our results show that the extent of risk sharing achieved does not depend on the overall development of the domestic financial system per se. Rather, it depends on how the financial system is organized. Specifically, we find that countries characterized by developed financial markets are less exposed to idiosyncratic risk, whereas the development of the banking sector contributes little to the international diversification of consumption risk. We also find that countries with market-based financial systems manage to share a significantly larger fraction of their country-specific risk than bank-based economies.*

**Keywords:** International Risk Sharing; Financial Development; Financial System

**JEL-Classification:** F36; F41

---

\*We thank Christian Bellak and Michael Klien for their helpful comments.

<sup>†</sup>Department of Economics, Vienna University of Economics and Business, Augasse 2-6, A-1090 Vienna, Austria, e-mail: markus.leibrecht@wu-wien.ac.at

<sup>‡</sup>Department of Economics, University of Linz, Altenbergerstrasse 69, A-4040 Linz, Austria, e-mail: johann.scharler@jku.at

Corresponding author: Markus Leibrecht, Department of Economics, Vienna University of Economics and Business, Augasse 2-6, A-1090 Vienna, Austria, e-mail: markus.leibrecht@wu-wien.ac.at, tel: +43 1 31336 5833, fax: +43 1 31336 9203

# Banks, Financial Markets and International Consumption Risk Sharing

## **Abstract**

In this paper we empirically explore how characteristics of the domestic financial system influence the international allocation of consumption risk using a sample of OECD countries. Our results show that the extent of risk sharing achieved does not depend on the overall development of the domestic financial system *per se*. Rather, it depends on how the financial system is organized. Specifically, we find that countries characterized by developed financial markets are less exposed to idiosyncratic risk, whereas the development of the banking sector contributes little to the international diversification of consumption risk. We also find that countries with market-based financial systems manage to share a significantly larger fraction of their country-specific risk than bank-based economies.

# 1 Introduction

How do countries deal with macroeconomic risk? In principle, countries should be able to pool and diversify idiosyncratic, that is, country-specific, risk internationally and thereby smooth consumption despite the occurrence of shocks. Although an extensive literature shows that the extent of consumption risk sharing between countries is relatively low (see e.g. Obstfeld and Rogoff, 2000; Lewis, 1999; Obstfeld, 1994; Backus et al., 1992), the precise channels through which risk is shared are less clear.

In this paper we study the role of domestic financial systems, by which we mean financial markets and banks, for the international sharing of consumption risk. The domestic financial system may be relevant for the international allocation of risk since it should provide instruments to share risk across countries. However, the provision of appropriate instruments may depend on how developed the financial system is and on how it is organized.

In general, countries with more developed financial systems are more likely to provide the appropriate instruments to share risk across borders. Thus, the overall development of the domestic financial system may determine the extent to which idiosyncratic risk can be diversified across countries. However, financial systems may be rather heterogeneous in terms of the development of the individual sectors. In other words, an overall highly developed financial system may be the result of a developed banking sector or sophisticated financial markets or both. If banks and financial markets are distinct channels for risk sharing then the degree of risk sharing achieved may in fact depend on the development of financial markets and of banks, respectively, and not on the overall development of the domestic financial system *per se*. In this case, it also follows that the extent of risk sharing may depend on which element of the financial system is dominant. In market-based systems, financial markets are relatively more important than the banking sector, whereas the opposite is true in countries which are better described as bank-based financial systems.<sup>1</sup> Thus, risk sharing may vary across these types of financial system.

Against this background we explore empirically how characteristics of the domestic financial system influence the extent to which countries are able to share country-specific

---

<sup>1</sup>See Allen and Gale (2000) for a classification and a more detailed discussion of financial systems.

risk internationally. Our results indicate that it is primarily the development of financial markets which helps to share risk across countries. This result is in line with the idea that financial markets provide the necessary instruments to trade and diversify risk. Moreover, we find that banks play only a limited role for international risk sharing, which may be due to a home bias in bank assets (see e.g. Vazquez and Garcia-Herrero, 2007). Thus, financial markets and banks do not appear to be close substitutes for the international sharing of consumption risk. Furthermore, we find that countries characterized by market-based financial systems tend to be less exposed to idiosyncratic consumption risk than countries with bank-based systems.

Our analysis is closely related to Sorensen et al. (2007) and Hoffmann and Shcherbakova (2008) who argue that banks play an important role for the sharing of risk across US states. Thus, although the banking sector in the US contributes to risk sharing across states, banks do not appear to improve risk sharing across countries. The paper is also closely related to Hoffmann and Nitschka (2008). They show that the securitization of mortgage debt contributes significantly to risk sharing by making risk associated with residential real estate tradable. Yet, our analysis takes a broader view by analyzing the role of financial markets in general. Nevertheless, our results confirm that the tradability of risk helps to reduce the exposure to country-specific shocks.

The paper is structured as follows: Section 2 sketches why characteristics of the domestic financial system may determine the degree of risk sharing and it summarizes the four issues that we explore in the paper. Section 3 describes the empirical methodology and the data set. Section 4 presents the estimation results. Section 5 summarizes and concludes the paper.

## **2 The Domestic Financial System and Risk Sharing**

In this section, we discuss how characteristics of the domestic financial system may influence the extent to which country-specific risk is shared internationally. Basically, consumption risk can be diversified across countries via financial transactions. Consequently risk sharing should be closely related to cross-border financial flows. Nevertheless, at a somewhat deeper level, characteristics of the domestic financial system may ultimately

determine how well countries can insure against idiosyncratic risk.

In general, it appears plausible that the instruments which are necessary to share risk efficiently are more readily available in financial systems which are characterized by a relatively high level of development. Thus, countries with developed financial systems - in a broad sense - should be less exposed to idiosyncratic risk. Yet, the overall level of development does not take into account how the financial system is organized. In principle, agents can insure against country-specific risk by holding diversified portfolios consisting of assets which represent claims on a country's GDP. If such assets are traded on financial markets, risk essentially becomes tradable. Consequently, one would expect that countries with more developed financial markets are able to share risk to a greater extent, simply because risk is more tradable.

However, even if risk is not sufficiently tradable due to a lack of the appropriate instruments or if direct financial market participation is limited, international risk sharing may still occur indirectly through financial intermediaries. Consider for instance the case where a country is hit by macroeconomic shocks which lead to fluctuations in income. Although a substantial fraction of agents in the economy may not be able to smooth these shocks via cross-border financial transactions, they may be able to smooth consumption by either depositing funds at a bank or by borrowing from a bank. In other words, agents share risk intranationally with banks.<sup>2</sup> These, in turn, diversify risk across countries and thereby reallocate risk internationally. A similar point is emphasized by Sorensen et al. (2007) and Hoffmann and Shcherbakova (2008) who find that banks play an important role for risk sharing between federal states in the US.

More generally, the international sharing of consumption risk may involve two stages. At the first stage, risk is pooled within countries and then, at the second stage, risk is diversified across countries. If risk is shifted from agents with limited access to international financial markets, e.g. households, to agents who can more easily participate on international financial markets, as for instance banks, then the overall exposure to country-specific risk may decline. In this sense, financial intermediaries may act as a substitute for the tradability of risk.<sup>3</sup>

---

<sup>2</sup>Boot (2000) argues that banks increasingly provide risk sharing in a general sense, since the traditional banking business has been declining over time.

<sup>3</sup>Note that in addition to financial intermediaries who diversify risk internationally on behalf of retail

In short, risk is either shared directly via asset trade, or indirectly via intermediaries such as banks. As long as banks and markets give rise to the same net foreign asset position, that is, if intermediaries just replicate the net foreign asset position that results from the direct trade of assets, the organization of the domestic financial system is largely irrelevant. In this case banks and markets are essentially close substitutes for the international allocation of risk and therefore risk sharing depends only on the overall level of development of the domestic financial system. However, this need not be the case and therefore financial markets and banks may represent distinct channels of risk sharing.

So far, we have focused either on financial development in a broad sense, or on the development of individual sectors of the financial system. The extent of risk sharing may also depend on which element of the financial system is the most dominant, that is, whether a country is better characterized as a market-based or as bank-based financial system. Consider, for instance, two countries where financial markets are developed to a similar extent. Suppose that in one of the countries banks are relatively more important than markets in the sense that financial transactions are primarily conducted through banks, whereas in the other country, markets are relatively more important than banks. Clearly, if banks and financial markets represent distinct channels for risk sharing, then the countries may achieve different levels of risk sharing despite the fact that they both have financial markets with similar degrees of development. In short, the overall extent of risk sharing may vary across countries characterized by different types of financial system. Thus, whether banks and financial markets are indeed distinct channels for risk sharing and which type of financial system leads to a lower exposure to risk, are both empirical questions.

To sum up, the first issue we explore in the paper is whether countries with more developed domestic financial systems are less exposed to idiosyncratic risk. Second, we analyze if countries characterized by more developed financial markets manage to diversify a larger fraction of their idiosyncratic risk. If macroeconomic risk cannot be traded to

---

customers, financial markets may provide a similar type of intermediation via investments in multinational companies. Multinational companies typically acquire claims on the GDPs of foreign countries. Thus, an agent who invests in a multinational company essentially purchases a diversified portfolio of claims on foreign productive assets. Hence, in addition to ensuring that macroeconomic risk become tradable, financial markets also allow to shift risk to agents with a readier access to international financial markets.

a sufficient extent, financial intermediaries can still facilitate international risk sharing. Therefore, the third issue we study is the role of banks for international risk sharing. And finally, we directly test which type of financial system, market-based or bank-based, provides more risk sharing.

## 3 Empirical Strategy and Data

### 3.1 Empirical Strategy

To empirically evaluate the role of the domestic financial system for risk sharing we adopt the framework advocated in Asdrubali et al. (1996) which has become the workhorse approach to measure risk sharing. The standard risk sharing regression is based on the benchmark of complete markets. Intuitively, under complete markets any idiosyncratic influences are diversified away and therefore consumption should only react to global factors, which affect all countries. More specifically, if markets are complete and if preferences of the representative agent are described by a constant relative risk aversion utility function, then we should observe that:  $\Delta \log c_{it} = \Delta \log c_{jt}$ , where  $c_{it}$  and  $c_{jt}$  denote real per capita consumption in countries  $i = 1, \dots, N$  and  $j = 1, \dots, N$  at time  $t$ . Thus, consumption growth rates are equalized across countries (see e.g. Obstfeld and Rogoff, 1996, chapter 5, for a detailed derivation).

Since this condition for an optimal allocation has to hold for any two countries  $i$  and  $j$ , it also has to hold between country  $i$  and the world average:  $\Delta \log c_{it} = \Delta \log c_t$ , where  $c_t$  is a population weighted average of real per capita consumption growth rates. That is, under complete markets, consumption growth in each country should be equal to average growth.

If full risk sharing is not feasible due to incomplete markets, then consumption growth may depend on idiosyncratic variables, such as idiosyncratic income growth,  $\Delta \log y_{it} - \Delta \log y_t$ , where  $\Delta \log y_{it}$  is the growth rate of per capita output in country  $i$  and  $\Delta \log y_t$  is the average per capita output growth rate across countries:

$$\Delta \log c_{it} - \Delta \log c_t = \beta(\Delta \log y_{it} - \Delta \log y_t), \quad (1)$$

The left-hand-side of the equation is essentially the deviation from the benchmark of per-



fect risk sharing, which is linked to idiosyncratic output growth on the right-hand-side. If  $\beta = 0$ , then we have perfect risk sharing. In contrast,  $\beta = 1$  corresponds to a complete lack of risk sharing, that is, the autarky allocation. More generally, Asdrubali et al. (1996) show that  $\beta$  can be interpreted as the exposure to idiosyncratic risk. Put differently,  $\beta$  measures the fraction of idiosyncratic shocks which are not shared internationally. Similarly,  $1 - \beta$  provides a measure of the extent of risk sharing. To empirically quantify the extent of risk sharing, Asdrubali et al. (1996) run a panel regression of idiosyncratic consumption growth on idiosyncratic output growth:

$$\Delta\tilde{c}_{it} = \zeta_i + \beta\Delta\tilde{y}_{it} + \epsilon_{it}, \quad (2)$$

where  $\Delta\tilde{c}_{it} = \Delta \log c_{it} - \Delta \log c_t$  and  $\Delta\tilde{y}_{it} = \Delta \log y_{it} - \Delta \log y_t$ ,  $\zeta_i$  denote country-fixed effects and  $\epsilon_{it}$  is the remainder error term.

To explore how the domestic financial system influences the exposure to idiosyncratic shocks we follow Sorensen et al. (2007) and allow  $\beta$  in (2) to depend on variables which proxy aspects of the financial system. More specifically, we parameterize  $\beta$  as

$$\beta = \beta_0 + \beta_F F + \gamma trend, \quad (3)$$

where  $F$  denotes a proxy either for the overall development of the financial system, for the development of financial markets and banks or for the type of the financial system.  $trend$  is a time trend. Several studies find that risk sharing has increased over the last decades due to deeper financial integration (see e.g. Artis and Hoffmann, 2008; Sorensen et al., 2007). We include  $trend$  to control for this increase in risk sharing in a general way. To specifically analyze the implications of financial integration we also estimate specifications where we replace  $trend$  in (3) by a proxy variable for international asset trade.

Using the parameterization for  $\beta$  and (2) we obtain our estimating equation:

$$\Delta\tilde{c}_{it} = \zeta_i + (\beta_0 + \beta_F F + \gamma trend)\Delta\tilde{y}_{it} + \epsilon_{it}. \quad (4)$$

So essentially we are adding interaction terms to capture the influence of the domestic financial system for the dependence of country-specific consumption growth on country-

specific output growth.<sup>4</sup> Note that  $\beta_0$  is the average exposure to idiosyncratic risk and  $\beta_F$  measures the effect of  $F$  on the exposure.

## 3.2 Data

Our analysis is based on annual data from 23 OECD countries and covers the period 1988 - 2004, since some the financial system variable we use for our analysis are not available for longer periods.<sup>5</sup> The precise sample varies somewhat depending on the availability of data for the individual countries. Real per capita consumption and real per capita GDP are taken from the Penn World Tables, described in Heston et al. (2006), and are measured in constant international prices. World aggregates are calculated as weighted averages:  $y_t = \sum_{i=1 \neq j}^{23} w_{it} y_{it}$  and  $c_t = \sum_{i=1 \neq j}^{23} w_{it} c_{it}$ . The weights  $w_{it}$  are calculated as  $w_{it} = pop_{it} / \sum_{i=1 \neq j}^{23} pop_{it}$ , where  $pop_{it}$  is the population of country  $i$  at time  $t$ .

To obtain proxy variables for the characteristics of the domestic financial system we draw on the large literature studying finance and growth. Data on financial system indicators are provided by Demirguc-Kunt and Levine (2001).<sup>6</sup> Specifically, we follow Demirguc-Kunt and Maksimovic (1998) and use bank assets as a percentage of GDP as an indicator for the development of the banking sector ( $bank_{it}$ ) and the ratio of stock market capitalization to GDP to proxy the development of financial markets ( $market_{it}$ ) in general. Based on these two variables we construct two further indicators for the domestic financial system: The first is a proxy for the overall level of the financial system's development, denoted by  $dev_{it}$ , which we calculate as  $dev_{it} = bank_{it} + market_{it}$ . The second variable we construct,  $syst_{it}$ , indicates the type of financial system which characterizes an economy. This variable is calculated as the size of financial markets relative to the size of the banking sector:  $syst_{it} = market_{it} / bank_{it}$ . We interpret countries characterized by high values of  $syst_{it}$  as being relatively more market-based economies.

---

<sup>4</sup>In addition to the interaction terms, we also include the variables contained in  $F$  directly in (4), that is, not interacted with  $\Delta \tilde{y}_{it}$ . Although the coefficients on these variables are not of direct interest for the analysis, the inclusion of these variables helps to avoid potential mis-specification. Further note, that a Newey-West-HAC-robust Variance-Covariance matrix of the remainder error term  $\epsilon_{it}$  is used in the analysis. Thereby, a lag of 3 is chosen which roughly corresponds to  $T^{1/3}$ .

<sup>5</sup>Our sample includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

<sup>6</sup>The data are available at: [http://www.econ.brown.edu/fac/Ross\\_Levine/Publications.htm](http://www.econ.brown.edu/fac/Ross_Levine/Publications.htm)

The set of financial variables,  $F$ , thus consists of  $dev_{it}$ ,  $market_{it}$ ,  $bank_{it}$  and  $syst_{it}$ . These four variables are directly related to the four issues we explore in this paper: If the overall level of development has a favorable impact on the degree of international risk sharing,  $dev_{it}$  should enter significantly with a negative sign in (4) (i.e.  $\beta_{dev} < 0$ ); If  $\beta_{market} < 0$ , then larger financial markets lead to a lower exposure to country-specific risk; Similarly,  $\beta_{bank} < 0$  indicates that countries with a larger banking sector are less exposed to idiosyncratic income shocks. This result would be consistent with the interpretation that banks diversify risk internationally on behalf of agents who do not participate on financial markets directly; Finally if  $\beta_{syst} < 0$ , then we may conclude that market-based economies are able to share a larger fraction of risk than bank-based economies.

To capture the effect of international financial transactions, we construct a measure for total asset trade,  $FA_{it}$ , as the sum of a country's foreign assets and liabilities to GDP (see Obstfeld, 2004). We interpret  $FA_{it}$  as a proxy for international financial integration. Data on foreign assets and liabilities are obtained from Lane and Milesi-Ferretti (2006) and consist of foreign direct investment, equity and debt portfolio investment and financial derivatives.

All variables, except  $trend$ , are logged to cope with potential outliers in the data. Moreover, we subtract the means from the variables included in  $F$ , from  $FA_{it}$  and also from  $trend$ . Using de-measured variables allows for a ready interpretation of the coefficients on the interaction terms.

Tables 1 and 2 show descriptive statistics for the variables used in the estimations. Note, that the correlations between  $FA_{it}$  and  $market_{it}$  as well as  $dev_{it}$  are relatively pronounced. In contrast, the correlation between  $bank_{it}$  and  $FA_{it}$  is rather low. These correlations can be considered as an indication for the close relationship between a country's domestic financial system and its international diversification of assets.

## 4 Estimation Results

Column (I) in Table 3 shows the results for the standard risk sharing equation augmented with a time trend, but without the financial system variables. We see that the average exposure to idiosyncratic risk is about 65 percent. Thus, countries are able to insure

against approximately 35 percent of idiosyncratic fluctuations in output. Moreover, the trend variable enters significantly with a negative sign, indicating a general increase in the degree of risk sharing over time. This result is in line with the existing literature (see e.g. Artis and Hoffmann, 2008).

The remaining columns of Table 3 show how  $dev_{it}$ ,  $market_{it}$ ,  $bank_{it}$ , and  $syst_{it}$  influence the exposure to idiosyncratic fluctuations in output. We see from column (II) that the interaction term involving  $dev_{it}$  enters with a negative sign. That is, high values of  $dev_{it}$  tend to reduce the impact of idiosyncratic output growth on consumption growth. However, the coefficient is not significant at conventional levels. Thus, column (II) provides only weak evidence in favor of the hypothesis that developed domestic financial systems result in higher risk sharing.

Columns (III) and (IV) show how the development of financial markets and of banks influence risk sharing. In contrast to the overall financial development, we see from column (III) that countries with large financial markets are less exposed to idiosyncratic risk. This result confirms our expectation that the higher tradability of risk associated with large and developed financial markets improves the ability to share risk across countries. The effect of  $market_{it}$  is not only statistically significant, but also economically meaningful. From a substantive point of view our results suggest that an increase in  $market_{it}$  by one standard deviation (i.e, by 0.782; cf. Table 1) increases the degree of risk sharing by about 10 percentage points to 45 percent.<sup>7</sup>

Concerning the role of banks, column (IV) shows that  $bank_{it}$  does not significantly impact upon the exposure to idiosyncratic risk. Thus, although large financial markets foster risk sharing, banks do not appear to provide international diversification of consumption risk. This conclusion is reinforced when we compare risk sharing across types of financial systems. Column (V) shows that higher values of  $syst_{it}$  significantly reduce the exposure to country-specific fluctuations in output growth.<sup>8</sup> That is, relatively more

---

<sup>7</sup>Calculated as  $0.657 - 0.124 * 0.782$ , based on column (III) in Table 3.

<sup>8</sup>Note, that in the specification in Column (V), we do not control for the overall level of development. Since  $syst_{it}$  ignores the overall level of development, countries where the relative importance of banks and markets is similar are treated similarly in this specification, although these countries may still differ substantially with respect to their overall level of financial development. However, since our sample consists only of OECD countries with relatively developed, albeit heterogeneous, financial systems, this issue does not appear to be problematic. This interpretation is also supported by the insignificance of  $dev_{it}$  in Column (I).

market-based systems are less exposed to risk, which is consistent with the interpretation that the tradability of risk in market-based systems is essential for risk sharing.

Thus, what matters for risk sharing is not financial development *per se*, but the development of financial markets. Banks do not appear to be a substitute for the tradability of risk. Moreover, market-based financial systems provide more risk sharing than bank-based systems. The result that it is primarily the tradability of risk which helps to share risk across countries is in line with Hoffmann and Nitschka (2008) who show that the increased tradability of risk due to securitization has improved international risk sharing. The limited influence of the banking sector on the extent to which countries are exposed to shocks contrasts somewhat with the important role of banks for risk sharing among US states documented by Sorensen et al. (2007). Thus, although banks foster intranational risk sharing, they do not appear to improve the sharing of risk across borders. Interestingly, this interpretation is in line with the empirically documented home bias in bank assets (see Vazquez and Garcia-Herrero, 2007) and also with the finding in Buch and DeLong (2004) that cross-border bank mergers can only be partly explained by diversification motives.

Yet, one might question our results with the argument that the proxies for the domestic financial system pick up too much short-run volatility to allow for a structural interpretation. For instance, stock market capitalization may be driven by price changes. That is, a relatively large stock market capitalization may not only be an indication for the development of financial markets, but may simply show that stock prices have strongly increased. And since risk sharing may be higher in times of rising stock prices, we may simply pick up the effect of stock prices instead of structural aspects of the financial system.

To meet this concern, we re-estimate (4) with categorical indicators for the various proxies of the domestic financial system.<sup>9</sup> That is, we group countries according to the characteristics of their financial systems. More specifically, we create a set of dummy variables,  $D_i^F$ , where  $F$  is either *dev*, *market*, *bank*, or *syst*, which are equal to unity

---

<sup>9</sup>We also explore the cross-sectional stability of our estimates by conducting a country-jackknife analysis. Our conclusions are robust to dropping individual countries from the sample. Detailed results are available upon request.

if the mean value of the respective financial indicator variable for country  $i$  is above the cross-country average. For example,  $D_i^{dev}$  is defined as  $D_i^{dev} = 1$  if  $1/(T) \sum_{t=1}^T dev_{it} > 1/(NT) \sum_{i=1}^N \sum_{t=1}^T dev_{it}$ , and  $D_i^{dev} = 0$  otherwise. The dummies  $D_i^{bank}$ ,  $D_i^{market}$  and  $D_i^{syst}$  are defined analogously. Note that since the grouping of countries depends on averages taken over time, we are much less likely to pick up any short run variation such as large movements in stock prices. Again to account for a general increase in risk sharing over time, we allow  $\beta$  to depend on a time trend which may now exert a different effect on risk sharing across the groups of countries.:

$$\beta = \beta_0 + \beta_{hF} D_i^F + \beta_{lF} (1 - D_i^F) + \gamma_{hF} D_i^F trend + \gamma_{lF} (1 - D_i^F) trend, \quad (5)$$

where  $h$  and  $l$  denote above and below cross-country average. From Table 4 we see that our main conclusions remain unaltered. According to column (I), countries with a more developed financial system are slightly less exposed to idiosyncratic risk, although the null hypothesis that the coefficients are equal (i.e.  $H_0 : \beta_{hdev} = \beta_{ldev}$ ) cannot be rejected. Nevertheless, column (II) shows that countries with an above average stock market capitalization are exposed to about 55 percent of the idiosyncratic variation in their outputs, whereas the exposure is about 80 percent for countries with below average stock market capitalizations. In addition to this economically meaningful difference, the null of equal exposures in both groups of countries is rejected. From column (III) we see that the exposure to idiosyncratic risk appears to be even higher in countries with large banking sectors, although the null of equal coefficients is not rejected. Finally, column (IV) shows that countries characterized by a market-based financial system are significantly less exposed to idiosyncratic risk.<sup>10</sup>

As a final step of our analysis, we now explore the impact of financial globalization on risk sharing in somewhat greater detail. In the estimations reported so far, we have included a time trend to take the impact of financial globalization into account. Although this approach has the advantage to allow for a substantial amount of flexibility, it captures variations in risk sharing over time in a general sense. By replacing *trend* with our proxy for foreign asset trade,  $FA_{it}$ , in (4) we are able to analyze the impact of financial

---

<sup>10</sup>The market-based countries are Australia, Canada, Denmark, Finland, Ireland, Japan, Luxembourg, Netherlands, Sweden, Switzerland, United Kingdom and the U.S.

globalization and integration more specifically. Since the domestic financial system and foreign asset trade are likely to be closely interrelated, this extension provides a more detailed picture of how the domestic financial system and international asset trade influence international consumption risk sharing.

According to Table 5 the coefficient on the interaction term  $\Delta\tilde{y}_{it} * FA_{it}$  is negatively signed and significant at standard levels in column (I). As expected, the degree of risk sharing achieved rises with an increase in total asset trade. However, adding  $FA_{it}$  changes the significance of the interaction terms involving  $market_{it}$  and  $syst_{it}$ . Although columns (III) and (V) indicate that an increase in  $market_{it}$  and  $syst_{it}$  reduces the exposure to shocks, these variables are only significant at the 15 percent level. These results are not entirely unexpected, since they may simply mirror the fact that domestic and foreign asset trade are closely interrelated in financially integrated economies. Hence, the insignificance of the interaction terms may just indicate that we are not able to distinguish the effects of the domestic financial system on the one hand, and of  $FA_{it}$  on the other hand.

To explore this point further, we now disentangle the effects of the domestic financial system variables and foreign asset trade. In particular, we orthogonalize  $FA_{it}$  and the financial system variables by running the following regression:<sup>11</sup>

$$FA_{it} = \alpha_0 + \alpha_F F + u_{it}^F, \quad (6)$$

where  $F$  is either  $dev_{it}$ ,  $market_{it}$ ,  $bank_{it}$  or  $syst_{it}$ . The estimated residual of this regression,  $\hat{u}_{it}^F$ , is by construction orthogonal to  $F$  and can therefore be interpreted as the extent of foreign asset trade which is not related to the financial system variable under consideration. Consequently, by substituting  $\hat{u}_{it}^F$  for  $FA_{it}$  in (4), we are able to distinguish between the influence of the domestic financial system and the role of trade in foreign assets.

The results are displayed in Table 6. We see that,  $dev_{it}$ ,  $market_{it}$  and  $syst_{it}$  significantly reduce the exposure to idiosyncratic output growth, which contrasts with the results shown in Table 5 but reinforces our previous conclusions. Table 6 suggests that the insignificance of the financial system variables in Table 5 was indeed due to the inter-

---

<sup>11</sup>See Benassy-Quere et al. (2007) for a similar approach.

relationship between the financial system variables and  $FA_{it}$ .

Note that  $\hat{u}_{it}^F$  is negatively signed regardless of specification estimated. However, this variable significantly increases the extent of risk sharing only in column (III) which includes  $bank_{it}$ . Hence, it appears that the banking sector and foreign asset trade represent unrelated channels for risk sharing. That is, countries with a large banking sector are still able to share risk via trade in foreign assets, but according to our results without the banking sector as an intermediary. Again, this result suggests that the banking sector plays only a limited role for the international sharing of consumption risk.

In contrast, the insignificance of  $\hat{u}_{it}^F$  in column (II) implies that larger financial markets tend to increase trade in assets domestically as well as across borders and thereby allow to pool risk across countries. Similarly, according to (IV), the impact of  $FA_{it}$  on risk sharing is closely related to domestic financial markets in market-based systems.

Thus, exploring the impact of financial globalization in more detail, not only confirms our previous results, but also reveals that the development of domestic financial markets appears to be the driving force behind both foreign asset trade and international risk sharing. This result supports our earlier interpretation according to which it is primarily the tradability of risk which matters for the international allocation of consumption risk.

## 5 Summary and Concluding Remarks

In this paper we explore how characteristics of the domestic financial system determine the degree to which countries can diversify risk internationally. Although risk is shared via foreign asset trade, our results suggest that it is ultimately the domestic financial system which drives the extent of risk sharing as the domestic financial system provides the means to trade risk across borders. In this sense, we complement the literature which focuses on the role of international capital flows for international consumption risk sharing (see e.g. Imbs, 2006; Sorensen et al., 2007; Imbs and Fratscher, 2007).

We find that the overall development of the financial system does not necessarily lead to a low exposure to shocks, but countries with developed financial markets are able to share a larger fraction of their idiosyncratic output risk internationally. Market-based financial systems tend to be less exposed to idiosyncratic shocks, whereas countries



characterized by bank-based financial systems are more exposed. We also find that foreign asset trade is closely linked to the domestic financial system. Specifically, developed financial markets are the driving force behind both foreign asset trade and international risk sharing. However, trade in foreign assets is largely independent of the banking sector.

It has to be pointed out, however, that although developed financial markets lead to relatively high risk sharing, the overall extent of risk sharing still remains limited. Thus, even market-based countries with developed financial markets are still exposed to a substantial fraction of idiosyncratic risk.

Moreover, it has to be kept in mind that we model the link between the domestic financial system and international financial flows in a rather ‘reduced-form’ way. Although our approach succeeds in separating out the influences of the domestic financial system and of foreign asset trade, we are not able to identify more structural relationships between these variables. An interesting direction for future research is to explicitly model these linkages in a more detail.

Finally, we would like to point out that although the focus of this paper is on the domestic financial system, the idea that structural or institutional aspects which are primarily related to domestic issues may also matter for the international allocation of consumption risk may apply more generally. Analyzing such issues in the context of international risk sharing appears to be another interesting avenue for future research.

## References

- Allen, F., Gale, D., 2000. *Comparing Financial Systems*. MIT Press, Cambridge, MA.
- Artis, M., Hoffmann, M., 2008. Financial globalization, international business cycles and consumption risk sharing. *Scandinavian Journal of Economics* 110 (3), 447–471.
- Asdrubali, P., Sørensen, B. E., Yosha, O., 1996. Channels of interstate risk sharing: The United States 1963-1990. *Quarterly Journal of Economics* 111 (4), 1081–1110.
- Backus, D. K., Kehoe, P. J., Kydland, F. E., 1992. International real business cycles. *Journal of Political Economy* 100 (4), 745–775.

- Benassy-Quere, A., Coupet, M., Mayer, T., 2007. Institutional determinants of foreign direct investment. *The World Economy* 30 (5), 764–782.
- Boot, A. W. A., 2000. Relationship banking: What do we know? *Journal of Financial Intermediation* 9 (1), 7–25.
- Buch, C. M., DeLong, G., 2004. Cross-border bank mergers: What lures the rare animal? *Journal of Banking & Finance* 28 (9), 2077–2102.
- Demirguc-Kunt, A., Levine, R., 2001. *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development*. MIT Press, Cambridge, MA.
- Demirguc-Kunt, A., Maksimovic, V., 1998. Law, finance, and firm growth. *Journal of Finance* 53 (6), 2107–2137.
- Heston, A., Summers, R., Aten, B., 2006. *Penn World Table Version 6.2*, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania.
- Hoffmann, M., Nitschka, T., 2008. Securitization of mortgage debt, asset prices and international risk sharing. IEW - Working Paper 376, Institute for Empirical Research in Economics - IEW.
- Hoffmann, M., Shcherbakova, I., 2008. Consumption risk sharing over the business cycle: The role of small firm's access to credit markets. IEW - Working Papers 363, Institute for Empirical Research in Economics - IEW.
- Imbs, J., 2006. The real effects of financial integration. *Journal of International Economics* 68 (2), 296–324.
- Imbs, J., Fratscher, M., 2007. Risk sharing, finance and institutions in international portfolios. Discussion Paper 6496, CEPR.
- Lane, P. R., Milesi-Ferretti, G. M., 2006. The external wealth of nations mark ii: Revised and extended estimates of foreign assets and liabilities, 1970 - 2004. IMF Working Paper 06/69, IMF.

- Lewis, K., 1999. Trying to explain home bias in equities and consumption. *Journal of Economic Literature* XXXVII, 571–608.
- Obstfeld, M., 1994. Are industrial-country consumption risks globally diversified? In: Leiderman, L., Razin, A. (Eds.), *Capital mobility: the impact on consumption, investment and growth*. Cambridge University Press, Cambridge.
- Obstfeld, M., 2004. External adjustment. *Review of World Economics* 140 (6), 541–568.
- Obstfeld, M., Rogoff, K., 1996. *Foundations of International Macroeconomics*. MIT Press.
- Obstfeld, M., Rogoff, K., 2000. The six major puzzles in international macroeconomics. In: Bernanke, B. S., Rogoff, K. (Eds.), *NBER Macroeconomic Annual 2000*. MIT Press, Cambridge, Massachusetts.
- Sorensen, B. E., Wu, Y.-T., Yosha, O., Zhu, Y., 2007. Home bias and international risk sharing: Twin puzzles separated at birth. *Journal of International Money and Finance* 26 (4), 587–605.
- Vazquez, F. F., Garcia-Herrero, A., 2007. International diversification gains and home bias in banking. IMF Working Papers 07/281, International Monetary Fund.

Table 1: Descriptive Statistics

		Mean	Std. Dev.	Min	Max	Obs
$\Delta \tilde{c}_{it}$	overall	-0.002	0.019	-0.080	0.056	368
	between		0.007	-0.012	0.018	
	within		0.018	-0.074	0.061	
$\Delta \tilde{y}_{it}$	overall	0.002	0.020	-0.091	0.072	368
	between		0.010	-0.011	0.038	
	within		0.018	-0.086	0.055	
$market_{it}$	overall	0.000	0.782	-2.202	1.833	357
	between		0.608	-1.334	1.034	
	within		0.496	-1.484	1.695	
$bank_{it}$	overall	0.000	0.389	-0.890	0.698	375
	between		0.326	-0.731	0.654	
	within		0.220	-0.558	0.919	
$syst_{it}$	overall	0.000	0.808	-2.449	2.118	342
	between		0.660	-1.631	1.416	
	within		0.480	-1.781	1.799	
$dev_{it}$	overall	0.000	0.389	-0.987	1.139	342
	between		0.294	-0.408	0.756	
	within		0.258	-0.739	0.836	
$FA_{it}$	overall	0.000	0.854	-1.339	4.557	379
	between		1.074	-0.729	4.408	
	within		0.431	-1.158	1.252	

Table 2: Correlation Matrix of the Explanatory Variables

	$\Delta\tilde{y}_{it}$	$market_{it}$	$bank_{it}$	$syst_{it}$	$dev_{it}$	$FA_{it}$
$\Delta\tilde{y}_{it}$	1.000					
$market_{it}$	0.175	1.000				
$bank_{it}$	-0.092	0.157	1.000			
$syst_{it}$	0.214	0.887	-0.318	1.000		
$dev_{it}$	0.071	0.807	0.663	0.465	1.000	
$FA_{it}$	0.166	0.540	0.419	0.321	0.614	1.000

Table 3: Domestic Financial System and Risk Sharing

	(I)	(II)	(III)	(IV)	(V)
$\Delta\tilde{y}_{it}$	0.653*** (0.049)	0.648*** (0.049)	0.657*** (0.049)	0.650*** (0.0450)	0.652*** (0.048)
$\Delta\tilde{y}_{it} * dev_{it}$		-0.199 (0.123)			
$\Delta\tilde{y}_{it} * market_{it}$			-0.124** (0.060)		
$\Delta\tilde{y}_{it} * bank_{it}$				0.003 (0.171)	
$\Delta\tilde{y}_{it} * syst_{it}$					-0.127** (0.057)
$\Delta\tilde{y}_{it} * trend$	-0.021** (0.011)	-0.016 (0.010)	-0.015 (0.010)	-0.019* (0.010)	-0.016* (0.009)
N	368	340	355	353	340

Notes: The endogenous variable is  $\Delta\tilde{c}_{it}$ ; All specifications include country-fixed effects; Newey-West-HAC-robust standard errors in parenthesis; \*\*\* / \*\* / \* = significant at 1 / 5 / 10 percent significance level.

Table 4: Risk Sharing with Grouped Countries

	(I)	(II)	(III)	(IV)
$\Delta \tilde{y}_{it} * D_i^{dev}$	0.600*** (0.091)			
$\Delta \tilde{y}_{it} * (1 - D_i^{dev})$	0.675*** (0.062)			
$\Delta \tilde{y}_{it} * D_i^{market}$		0.553*** (0.061)		
$\Delta \tilde{y}_{it} * (1 - D_i^{market})$		0.801*** (0.075)		
$\Delta \tilde{y}_{it} * D_i^{bank}$			0.669*** (0.075)	
$\Delta \tilde{y}_{it} * (1 - D_i^{bank})$			0.643*** (0.065)	
$\Delta \tilde{y}_{it} * D_i^{sys}$				0.562*** (0.061)
$\Delta \tilde{y}_{it} * (1 - D_i^{syst})$				0.799*** (0.076)
$\Delta \tilde{y}_{it} * trend_h^F$	-0.010 (0.016)	-0.016 (0.014)	-0.022 (0.013)	-0.019 (0.012)
$\Delta \tilde{y}_{it} * trend_l^F$	-0.028** (0.014)	-0.034** (0.015)	-0.020 (0.016)	-0.033** (0.016)
$N$	368	368	368	368
$p(\beta_{hF} = \beta_{lF})$	0.338	0.011	0.697	0.021

Notes: The endogenous variable is  $\Delta \tilde{c}_{it}$ ; All specifications include country-fixed effects; Newey-West-HAC-robust standard errors in parenthesis; \*\*\* / \*\* / \* = significant at 1 / 5 / 10 percent significance level;  $l$  = country with a below cross-country average value of the financial variable;  $h$  = country with an above cross-country average value of the financial system variable;  $F = (market_{it}, bank_{it}, dev_{it}, syst_{it})$ .

Table 5: Risk Sharing with Foreign Asset Position

	(I)	(II)	(III)	(IV)	(V)
$\Delta \tilde{y}_{it}$	0.667*** (0.044)	0.650*** (0.046)	0.660*** (0.045)	0.658*** (0.047)	0.646*** (0.045)
$\Delta \tilde{y}_{it} * dev_{it}$		-0.163 (0.151)			
$\Delta \tilde{y}_{it} * market_{it}$			-0.106 (0.069)		
$\Delta \tilde{y}_{it} * bank_{it}$				0.049 (0.164)	
$\Delta \tilde{y}_{it} * syst_{it}$					-0.096 (0.062)
$\Delta \tilde{y}_{it} * FA_{it}$	-0.135*** (0.046)	-0.082 (0.059)	-0.068 (0.058)	-0.143*** (0.044)	-0.088* (0.049)
N	357	333	344	346	333

Notes: The endogenous variable is  $\Delta \tilde{c}_{it}$ ; All specifications include country-fixed effects; Newey-West-HAC-robust standard errors in parenthesis; \*\*\* / \*\* / \* = significant at 1 / 5 / 10 percent significance level.

Table 6: Orthogonalization of  $F_{it}$  and  $FA_{it}$ 

	(I)	(II)	(III)	(IV)
$\Delta \tilde{y}_{it}$	0.645*** (0.0497)	0.660*** (0.047)	0.65318*** (0.047)	0.641*** (0.050)
$\Delta \tilde{y}_{it} * dev_{it}$	-0.276** (0.123)			
$\Delta \tilde{y}_{it} * market_{it}$		-0.147** (0.065)		
$\Delta \tilde{y}_{it} * bank_{it}$			-0.0825 (0.156)	
$\Delta \tilde{y}_{it} * syst_{it}$				-0.127** (0.063)
$\Delta \tilde{y}_{it} * \hat{u}_{it}^F$	-0.082 (0.067)	-0.068 (0.062)	-0.143** (0.057)	-0.088 (0.054)
N	333	344	346	333

Notes: The endogenous variable is  $\Delta \tilde{c}_{it}$ ; All specifications include country-fixed effects; \*\*\* / \*\* / \* = significant at 1 / 5 / 10 percent significance level. As  $\hat{u}_{it}^F$  is a generated regressor, bootstrapped standard errors are shown (a non-parametric bootstrap over countries with 1000 replications is performed).

## Bisher sind in dieser Reihe erschienen:

- Eigl R., Experimentielle Methoden in der Mikroökonomik, No. 1, Mai 1991.
- Dockner E., Long N.V., International Pollution Control: Cooperative versus Non-Cooperative Strategies, No. 2, September 1991.
- Andraea C.A., Eigl R., Der öffentliche Sektor aus ordnungspolitischer Sicht, No. 3, Oktober 1991.
- Dockner E., A Dynamic Theory of Conjectural Variations, No. 4, Oktober 1991.
- Feichtinger G., Dockner E., Cyclical Consumption Pattern and Rational Addictions, No. 5, Oktober 1991.
- Marterbauer M., Die Rolle der Fiskalpolitik im Schwedischen Wohlfahrtsstaat, No. 6, Dezember 1991.
- Pichler E., Cost-Sharing of General and Specific Training with Depreciation of Human Capital, No. 7, Dezember 1991.
- Pichler E., Union Wage Bargaining and Status, No. 8, Dezember 1991.
- Pichler E., Costs of Negotiations and the Structure of Bargaining - a Note, No. 9, Dezember 1991.
- Nowotny E., The Austrian Social Partnership and Democracy, No. 10, Dezember 1991.
- Pichler E., Walther H., The Economics of Sabbath, No. 11, April 1992.
- Klatzer E., Unger B., Will Internationalization Lead to a Convergence of National Economic Policies?, No. 12, June 1992.
- Bellak C., Towards a Flexible Concept of Competitiveness, No. 13, May 1992.
- Koren St., Stiassny A., The Temporal Causality between Government Taxes and Spending, No. 14, August 1992.
- Altzinger W., Ost-West-Migration ohne Steuerungsmöglichkeiten?, No. 15, September 1992.
- Bellack Ch., Outsiders' Response to Europe 1992, Case of Austria, No. 16, December 1992.
- Guger A., Marterbauer M., Europäische Währungsunion und Konsequenzen für die Kollektiv-vertragspolitik, No. 17, January 1993.
- Unger B., van Waarden F., Characteristics, Governance, Performance and Future Perspectives, No. 18, January 1993.
- Scharmer F., The Validity Issue in Applied General Equilibrium Tax Models, No. 19, May 1993.
- Ragacs Ch., Minimum Wages in Austria: Estimation of Employment Functions, No. 20, June 1993.
- Ragacs Ch., Employment, Productivity, Output and Minimum Wages in Austria: A Time Series Analysis, No. 21, September 1993.
- Stiassny A., TVP - Ein Programm zur Schätzung von Modellen mit zeitvariierenden Parametern, No. 22, December 1993.
- Gstach D., Scale Efficiency: Where Data Envelopment Analysis Outperforms Stochastic Production Function Estimation, No. 23, December 1993.
- Gstach D., Comparing Structural Efficiency of Unbalanced Subsamples: A Resampling Adaptation of Data Envelopment Analysis, No. 24, December 1993.
- Klausinger H., Die Klassische Ökonomie und die Keynesianische Alternative. Revision ein Mythos?, No. 25, December 1993.
- Grandner T., Gewerkschaften in einem Cournot-Duopol. Sequentielle versus simultane Lohnverhandlungen, No. 26, April 1994.
- Stiassny A., A Note on Frequency Domain Properties of Estimated VARs, No. 27, June 1994.
- Koren St., Stiassny A., Tax and Spend or Spend and Tax ? An International Study, No. 28, August 1994.
- Gstach D., Data Envelopment Analysis in a Stochastic Setting: The right answer from the wrong model?, No. 29, August 1994.
- Cantwell J., Bellak Ch., Measuring the Importance of International Production: The Re-Estimation of Foreign Direct Investment at Current Values, No. 30, January 1995.
- Klausinger H., Pigou's Macroeconomics of Unemployment (1933). A Simple Model, No. 31, February 1995.
- Häfke Ch., Helmenstein Ch., Neural Networks in Capital Markets: An Application to Index Forecasting, No. 32, January 1995.
- Hamberger K., Katzmair H., Arithmetische Politik und ökonomische Moral, Zur Genologie der Sozialwissenschaften in England, No. 33, May 1995.
- Altzinger W., Beschäftigungseffekte des österreichischen Osthandels, No. 34, July 1995.
- Bellak Ch., Austrian Manufacturing Firms Abroad - The last 100 Years, No. 35, November 1995.
- Stiassny A., Wage Setting, Unemployment and the Phillips Curve, No. 36, January 1996.
- Zagler M., Long-Run Monetary Non-Neutrality in a Model of Endogenous Growth, No. 37, June 1996.
- Traxler F., Bohmann G., Ragacs C., Schreckeneder B., Labour Market Regulation in Austria, No. 38, January, 1996.
- Gstach D., A new approach to stochastic frontier estimation: DEA+, No. 39, August 1996.
- Bellak Ch., Clement W., Hofer R., Wettbewerbs- und Strukturpolitik: Theoretische Begründung und neuere Entwicklungen in Österreich, No. 40, June 1996.
- Nowotny E., Dritter Sektor, Öffentliche Hand und Gemeinwirtschaft, No. 41, August 1996.
- Grandner T., Is Wage-Leadership an Instrument to Coordinate Union's Wage-Policy? The Case of Imperfect Product Markets, No. 42, November 1996.



- Pirker R., The Constitution of Working Time, No. 43, Januar 1997.
- Nowotny E., Konsequenzen einer Globalisierung der Weltwirtschaft für unsere Gesellschaft, No. 44, Januar 1997.
- Grandner T., Territoriale Evolution von Kooperation in einem Gefangenendilemma, No. 45, February 1997.
- Häfke Ch., Sögner L., Asset Pricing under Asymmetric Information, No. 46, February 1997.
- Stiassny A., Die Relevanz von Effizienzlöhnen im Rahmen von Gewerkschaftsverhandlungsmodellen, No. 47, May 1997.
- Stiassny A., Unsicherheit bezüglich der Preiselastizität der Güternachfrage als reale Rigidität, No. 48, May 1997.
- Klausinger H., Die Alternativen zur Deflationspolitik Brünings im Lichte zeitgenössischer Kritik, No. 49, June 1997.
- Wehinger G.D., Exchange Rate-Based Stabilization: Pleasant Monetary Dynamics?. No. 50, August 1997.
- Wehinger G.D., Are Exchange Rate-Based Stabilizations Expansionary? Theoretical Considerations and the Brazilian Case, No. 51, August 1997.
- Huber C., Sögner L., Stern A., Selbstselektierendes Strompreisregulierungsmodell, No. 52, August 1997.
- Ragacs Ch., Zagler M., Economic Policy in a Model of Endogenous Growth, No. 53, October 1997.
- Mahlberg B., Url T., Effects of the Single Market on the Austrian Insurance Industry, No. 54, February 1998.
- Gstach D., Grandner T., Restricted Immigration In a Two-Sector Economy, No. 55, March 1998.
- Sögner L., Regulation of a Complementary Imputed Good in a Competitive Environment, No. 56, March 1998.
- Altzinger W., Austria's Foreign Direct Investment in Central and Eastern Europe: 'Supply Based' or Market Driven?, No. 57, April 1998.
- Gstach D., Small Sample Performance of Two Approaches to Technical Efficiency Estimation in Noisy Multiple Output Environments, No. 58, June 1998.
- Gstach D., Technical Efficiency in Noisy Multi-Output Settings, No. 59, June 1998.
- Ragacs Ch., Zagler M., Growth Theories and the Persistence of Output Fluctuations: The Case of Austria, No. 60, October 1998.
- Grandner T., Market Shares of Price Setting Firms and Trade Unions, No. 61, October 1998.
- Bellak Ch., Explaining Foreign Ownership by Comparative and Competitive Advantage: Empirical Evidence, No. 62, March 1999.
- Klausinger H., The Stability of Full Employment. A Reconstruction of Chapter 19-Keynesianism, No. 63, April 1999.
- Katzmair H., Der Modellbegriff in den Sozialwissenschaften. Zum Programm einer kritischen Sozio-Logik, No. 64, June 1999.
- Rumler F., Computable General Equilibrium Modeling, Numerical Simulations in a 2-Country Monetary General Equilibrium Model, No. 65, June 1999.
- Zagler M., Endogenous Growth, Efficiency Wages and Persistent Unemployment, No. 66, September 1999.
- Stockhammer E., Robinsonian and Kaleckian Growth. An Update on Post-Keynesian Growth Theories, No. 67, October 1999.
- Stockhammer E., Explaining European Unemployment: Testing the NAIRU Theory and a Keynesian Approach, No. 68, February 2000.
- Klausinger H., Walras's Law and the IS-LM Model. A Tale of Progress and Regress, No. 69, May 2000.
- Grandner T., A Note on Unionized Firms' Incentive to Integrate Vertically, No. 70, May 2000.
- Grandner T., Optimal Contracts for Vertically Connected, Unionized Duopolies, No. 71, July 2000.
- Heise, A., Postkeynesianische Beschäftigungstheorie, Einige prinzipielle Überlegungen, No. 72, August 2000.
- Heise, A., Theorie optimaler Lohnräume, Zur Lohnpolitik in der Europäischen Währungsunion, No. 73, August 2000.
- Unger B., Zagler M., Institutional and Organizational Determinants of Product Innovations. No. 74, August 2000.
- Bellak, Ch., The Investment Development Path of Austria, No. 75, November 2000.
- Heise, A., Das Konzept einer nachhaltigen Finanzpolitik aus heterodoxer Sicht – ein Diskussionsbeitrag, No. 76, April 2001.
- Kocher M., Luptacik M., Sutter M., Measuring Productivity of Research in Economics. A Cross-Country Study Using DEA, No. 77, August 2001.
- Munduch, G., Pfister A., Sögner L., Stiassny A., Estimating Marginal Costs for the Austrian Railway System, No. 78, February 2002.
- Stückler M., Überprüfung von Gültigkeit und Annahmen der Friedman-These für Rohstoffmärkte, No. 79, July 2002.
- Stückler M., Handel auf Terminkontraktmärkten, No. 80, July 2002.
- Ragacs Ch., Minimum Wages, Human Capital, Employment and Growth, No. 81, August 2002.
- Klausinger H., Walras' Law in Stochastic Macro Models: The Example of the Optimal Monetary Instrument, No. 82, November 2002.
- Gstach D., A Statistical Framework for Estimating Output-Specific Efficiencies, No. 83, February 2003.

Gstach D., Somers A., Warning S., Output specific efficiencies: The case of UK private secondary schools, No. 84, February 2003.

Kubin I., The dynamics of wages and employment in a model of monopolistic competition and efficient bargaining, No. 85, May 2003.

Bellak Ch., The Impact of Enlargement on the Race For FDI. No. 86 Jan. 2004

Bellak Ch., How Domestic and Foreign Firms Differ and Why Does it Matter?. No. 87 Jan. 2004

Grandner T., Gstach D., Joint Adjustment of house prices, stock prices and output towards short run equilibrium, No. 88, January 2004

Currie M., Kubin I., Fixed Price Dynamics versus Flexible Price Dynamics, No. 89, January 2005

Schönfeld S., Reinstaller A., The effects of gallery and artist reputation on prices in the primary market for art: A note, No. 90, May 2005

Böheim, R. and Muehlberger, U., Dependent Forms of Self-employment in the UK: Identifying Workers on the Border between Employment and Self-employment. No. 91, Feb. 2006

Hammerschmidt, A., A strategic investment game with endogenous absorptive capacity. No. 92, April 2006

Onaran, Ö., Speculation-led growth and fragility in Turkey: Does EU make a difference or “can it happen again”? No. 93, May 2006

Onaran, Ö., Stockhammer, E., The effect of FDI and foreign trade on wages in the Central and Eastern European Countries in the post-transition era: A sectoral analysis. No. 94, June 2006

Burger, A., Reasons for the U.S. growth period in the nineties: non-keynesian effects, asset wealth and productivity. No. 95, July 2006

Stockhammer, E., Is the NAIRU theory a Monetarist, New Keynesian, Post Keynesian or a Marxist theory? No. 96, March 2006

Onaran, Ö., Aydiner-Avsar, N., The controversy over employment policy: Low labor costs and openness, or demand policy? A sectoral analysis for Turkey. No. 97, August 2006

Klausinger, H., Oskar Morgenstern als wirtschaftspolitischer Berater in den 1930er-Jahren. No. 98, July 2006

Rocha-Akis, S., Labour tax policies and strategic offshoring under unionised oligopoly. No. 99, November 2006

Stockhammer, E., Onaran, Ö., National and sectoral factors in wage formation in Central and Eastern Europe. No. 100, December 2006

Badinger, H., Kubin, I., Vom kurzfristigen zum mittelfristigen Gleichgewicht in einer offenen Volkswirtschaft unter fixen und flexiblen Wechselkursen. No. 101, January 2007

Stockhammer, E., Onaran, Ö., Ederer, S., Functional income distribution and aggregate demand in the Euro-area. No. 102, February 2007

Onaran, Ö., Jobless growth in the Central and Eastern European Countries: A country specific panel data analysis for the manufacturing industry. No. 103, March 2007

Stockhammer, E., Ramskogler, P., Uncertainty and exploitation in history. No. 104, April 2007

Ramskogler, P., Uncertainty, market power and credit rationing. No. 105, August 2007

Stockhammer, E., Ederer, S., Demand effects of the falling wage share in Austria. No. 106, August 2007

Steidl, A., Stockhammer, E., Coming and leaving. Internal mobility in late Imperial Austria. No. 107, August 2007.

Onaran, Ö., International financial markets and fragility in the Eastern Europe: “can it happen” here? No. 108, September 2007.

Grandner, T., Product differentiation in a linear city and wage bargaining. No 109, September 2007.

Hein, E., Stockhammer, E., Macroeconomic policy mix, employment and inflation in a Post-Keynesian alternative to the New Consensus Model. No. 110, October 2007

Commendatore, P., Kubin, I., Petraglia, C., Footloose capital and productive public services. No. 111, October 2007

Riedl, A., Rocha-Akis, S., Testing the tax competition theory: How elastic are national tax bases in western Europe? No. 112, November 2007

Pufahl, A., Weiss, C., Evaluating the effects of farm programs: Results from propensity score. No. 113, November 2007

Stockhammer, E., Hein, E., Grafl, L. Globalization and the effects of changes in functional income distribution on aggregate demand in Germany. No. 114, December 2007

Smet, K. Stuck in the middle? The structure of trade between South Africa and its major trading partners. No. 115, December 2007

Fellner, G., Sutter, M. Causes, consequences, and cures of myopic loss aversion – An experimental investigation. No. 116, January 2008

Riedl, A. Contrasting the dynamic patterns of manufacturing and service FDI: Evidence from transition economies. No. 117, January 2008

Onaran, Ö., The effect of foreign affiliate employment on wages, employment, and the wage share in Austria. No. 118, March 2008

Onaran, Ö., The effect of import penetration on labor market outcomes in Austrian manufacturing industry. No. 119, March 2008

Hein, E., Shareholder value orientation, distribution and growth – short- and medium-run effects in a Kaleckian model. No. 120, March 2008

Figerl, J., Grandner, T. Job quality and wages in duopsony. No. 121, June 2008

Fellner, G., Lünser, G. K. Cooperation in local and global groups. No. 122, July 2008

Stockhammer, E., Grafl, L. Financial uncertainty and business investment. No. 123, August 2008

Stockhammer, E., Ramskogler, P. Post Keynesian economics – how to move forward. No. 124, December 2008

Grafeneder-Weissteiner, T., Prettnner, K. Agglomeration and population aging in a two region model of exogenous growth. No. 125, February 2009

Onaran, Ö., Stockhammer, E., Grafl, L. The finance-dominated growth regime, distribution, and aggregate demand in the US. No. 126, February 2009

Stockhammer, E. The finance-dominated accumulation regime, income distribution and the present crisis. No. 127, April 2009

Leibrecht, M., Scharler, J. Banks, financial markets, and international consumption risk sharing. No. 128, May 2009