The Seignorage Costs of the Euro for Germany A Critique of Sinn and Feist

Nikolaus K.A. Läufer

Universität Konstanz

Abstract. With EMU came a pooling of seignorage profits and losses and Germany may have to make (transfer) payments into the common seignorage pool. Germany also lost its competitive advantage on the international market for monetary base. This alone causes losses of seignorage profits. Losses from seignorage pooling may come on top. It is conceivable that the loss in competitive advantage may be so strong that Germany will eventually receive payments from the seignorage pool while suffering from a net loss in seignorage profits. Sinn and Feist see German losses as arising exclusively from the pooling of seignorage profits ("Without pooling no losses!"). In spite of confusing payments into the pool with seignorage losses and some additional errors, these authors manage to arrive, by a suitable compensation of errors, at a numerical loss figure that covers both sources of losses. Here, the quality of the Euro is important. The empirical evidence since the start of EMU supports our critique. A proof of error compensation is given in the appendix.

1 Introduction

Sinn and Feist (1997) have found rather high costs for Germany in the form of lost capitalized seignorage profits as a consequence of EMU: DM 90 bn. in what they call a "status quo" forecast. They base their estimate exclusively on the anticipated German payments into a pool of EMU countries. Under EMU, seignorage profits and losses are pooled before they are redistributed to the union members in proportion to their capital shares in the European Central Bank (ECB).[1] We shall demonstrate that Germany indeed faces substantial seignorage losses as a result of EMU, but that it is inappropriate to identify such losses with the observable (transfer) payments of seignorage profits into the EMU seignorage pool (problem of measurement). In fact, we claim that Germany would suffer from seignorage losses even without such a pool.

2 The hidden assumptions

Sinn and Feist assume that both the monetary base in Europe and the distribution of its production among EMU member central banks will not change with the introduction of the Euro. This approach rests on two hidden assumptions.

[1] The capital shares were determined on the basis of data on average GDP and population of the member countries.

Assumption 1: The quality of the Euro matches that of the German mark.

Assumption 2: The distribution of the production of monetary base among the member central banks does not change with the switch to EMU.

We shall examine these assumptions in some detail.

3 The role of the quality of the Euro

The first assumption is clearly arguable. If the quality of the Euro were inferior, former holders of German marks would eventually replace their Euro by some other outside currency (Swiss francs, Yen, or US dollars) and the ECB would loose share in the world market for monetary base.[2] The seignorage cake of EMU would shrink while the seignorage cake outside EMU would expand. Of course, the opposite would hold if the Euro were superior to the Mark.

4 The role of the German competitive advantage on the international market for monetary base

The second assumption is to be rejected on both theoretical and empirical grounds. With the switch to EMU, all currency differences among EMU countries vanish and all national central banks of EMU offer the same homogeneous currency product. Currency quality differences are eliminated. The non-German member central banks of EMU are loosing their competitive disadvantage on the international market for monetary base. Prior to EMU, Germany had a monopoly type of position on that market. By joining, it lost this advantage and now faces an oligopolistic market with all its well known indeterminacies. The German loss of competitive advantage is independent of assumption 1.

German losses from a decline in market share have already occurred and are likely to continue. Recent data show that Germany is loosing market share in the production of monetary base at an accelerating rate. Since the start of EMU, i.e. within the first 18 months, the Mark has lost 1.5 percent of its former market share, and this rate has increased to 3 percent per annum during the period May-August 2000. If this is to continue, Germany will soon become a recipient of the seignorage pool. This evidence contradicts assumption 2.

5 The error of identifying losses with (transfer) payments into the seignorage pool

Two important conclusions follow: First, it is essential to distinguish between German losses in seignorage profits on account of its loss of competitive ad-

[2] Clearly, we refer here to the role of the German mark and the Euro as international transaction or reserve currencies.

vantage and German net (transfer) payments into the seignorage pool. Second, we cannot measure the former by the latter. These simple and basic truths are neglected by Sinn and Feist.

There are two types of measurement errors in Sinn and Feist. The first measurement error is committed by identifying total seignorage losses with payments into the seignorage pool.[3] And a second measurement error occurs in their calculation of payments into and out of the pool.

A simple thought experiment illustrates the first measurement error. With the method of Sinn and Feist, German losses of seignorage profits would be zero if we had EMU but no seignorage pooling, no matter how serious Germany's loss of competitive advantage on the international market for monetary base is.[4]

The following empirical evidence relates to the second measurement error. Sinn and Feist forecast DM 90 bn. of capitalized payments into the EMU seignorage pool. However, in 1999 the Bundesbank paid merely net Euro 72 millions into this pool.[5] As a percentage of a stock of capitalized payments of DM 90 bn. this implies an implausible, near zero rate of interest.

Consequently, the procedure of Sinn and Feist neither produces acceptable forecasts of seignorage transfers nor is it an acceptable *method* for calculating German losses of seignorage profits.

6 The "correct" magnitude of the losses of seignorage profits

Basically, German losses of seignorage profits correspond simply to the difference between Germany's seignorage profits that would accrue without the Euro and its share in the pooled seignorage profits under the Euro. Without growth[6] and other changes unrelated to the Euro, seignorage profits in Germany without the Euro[7] would be equal to those before EMU. Under assumption 1, the total volume of EMU seignorage will not change with the transition to the Euro. With these assumptions, we obtain the DM 90 bn. of Sinn and Feist. This loss arises even if Germany received positive payments out of the pool and thus were a "winner" in the language of Sinn and Feist.

Evidently, we have a paradoxical result. The numbers of Sinn and Feist are meaningless as a forecast of German payments into the seignorage pool,

[3] See the error term $e_{1,j}$ in the appendix.

[4] Sinn and Feist's confusion of (transfer) payments with losses goes as far as to not using the word "transfer" at all. Transfer payment is our word for payments into the seignorage pool. Conceptually, these payments can be negative.

[5] See the position "net result arising from allocation of monetary income" in the English version of the annual report of the Deutsche Bundesbank (1999), p. 162.

[6] We are following here Sinn and Feist in neglecting any growth of the monetary base (stationarity assumption).

[7] Without the Euro there would be no loss in market share.

yet their DM 90 bn. is a reasonable estimate of the German losses of seignorage profits from joining EMU. A conceptionally faulty forecast of transfer payments gives, in a sense, a correct forecast of seignorage profit losses. The reason for this paradoxical result is the coincidence of three errors in the analysis of Sinn and Feist, two of which happen to cancel while the third is tolerable as a condition in forecasting.[8] The first error consists in confusing losses with payments into and out of the seignorage pool;[9] and the second consists in assuming that Germany is not loosing its competitive advantage on the international market of monetary base.[10] We will show in the appendix that the first two errors cancel. The third error is a potential error, that would gain weight if assumption 1 turned out to be wrong.[11] The assumption that this third error is negligible meets our sympathy and may be considered as an optimistic condition of their forecast.

7 The role of minimum required reserves

Sinn and Feist also deal with the consequences of harmonizing minimum reserve requirements for commercial banks in Europe. Their calculations proceed from the additional (arguable) assumption that the monetary base will decrease by exactly the amount by which required reserves decline. They find that German payments into the seignorage pool would be reduced to DM 63.7 bn., and they believe that this would be better for Germany.[12] Again, their persistent confusion of payments into the seignorage pool with seignorage losses demands its price.

Without EMU, an elimination of minimum reserve requirements would have lowered the German production of monetary base, and this would have reduced already the seignorage profits of the German Bundesbank. Any losses from the change in market shares under EMU are additional. Therefore, the German loss of seignorage profits, as a total, would have been higher than without the harmonization (i.e. the reduction) of reserve requirements. Sinn and Feist claim the opposite. While it is true that the German net payments into the seignorage pool would decline if reserve requirements were eliminated it remains true that such payments are simply not measuring losses of seignorage profits.

[8] To be precise: We are not counting the stationarity assumption as an error.
[9] See the error terms $e_{1,D}$ in the appendix.
[10] See the error term $e_{2,D}$ in the appendix.
[11] See the error term $e_{3,D}$ in the appendix.
[12] It is quite a different story to view any reduction of seignorage profits of the central bank as a gain in welfare of the private public. However, there is no indication that Sinn and Feist had such an interpretation in mind.

8 Final result

Germany's loss of seignorage profits from joining EMU must not be confused with its payments into the seignorage pool. Without pooling, transfers of seignorage profits would be zero, yet Germany would still loose seignorage profits on account of having lost its competitive advantage.

The numbers of Sinn and Feist are useless as a forecast of capitalized *payments* into and out of the seignorage pool and their *method* of calculating Germany's seignorage losses is completely unacceptable. Yet, paradoxically, their figure of a German loss of DM 90 bn. is, under certain conditions, a rather good estimate of their likely true size.[13]

The downward harmonization of minimum reserve requirements in Europe has not reduced the German *losses* of seignorage profits as Sinn and Feist maintain, quite the contrary.

Sinn and Feist commit three errors. First, they confuse seignorage losses with payments into the seignorage pool. Second, they neglect that Germany, by its participation in EMU, looses its competitive advantage on the international market for monetary base. And third, they assume that the quality of the Euro will match that of the German mark.[14] However, Sinn and Feist were lucky in estimating Germany's losses of seignorage profits for their "status quo" case at DM 90 bn. because the first two errors happen to cancel while the third error may in fact be negligible due to its likely small magnitude.[15]

In addition, the issue of growth (non-stationarity) has been neglected by Sinn and Feist. The empirical evidence from the brief period that EMU is in place supports our criticism.

References

Deutsche Bundesbank (1999) Annual Report.

Sinn, Hans-Werner und Holger Feist (1997) Eurowinners and Euroloosers: The Distribution of Seignorage Wealth in EMU, European Journal of Political Economy **13**, 665-689; first published under the same title by the Center for Economic Studies, University of Munich, CES Working Paper Series, Working Paper **134**, May 1997.

Appendix: Error compensation à la Sinn and Feist

We shall now demonstrate that Sinn and Feist, in their "status quo" case, arrive at a "correct" numerical result for the seignorage losses and gains

[13] This capitalized loss of DM 90 bn. will eat up the indisputable gains from savings in transactions costs by the introduction of the Euro for quite a number of years to come.

[14] If this assumption were wrong, it would introduce an additional error.

[15] For the same reasons, their "status quo" calculations of gains and losses for other EMU countries happen to be acceptable as well.

of Germany by committing compensating errors. A series of definitions and abbreviations will be necessary.

A Definitions

G_i^v, (G_i^n): Produced monetary base, i.e. capitalized seignorage profits in country i before (after) the introduction of the Euro.
$\sum_i G_i^v$ ($\sum_i G_i^n$): Total production of monetary base in EMU-countries, i.e. capitalized seignorage profits in Europe before (after) the introduction of the Euro.
V_i^m (V_i^o): Capitalized seignorage net losses of country i due to the introduction of the Euro with (without) pooling of seignorage profits in EMU.
T_i: Capitalized net (transfer) payments of country i in and out of the seignorage pool of EMU.

B Concepts

In order to compute the capitalized seignorage losses[16] of a country correctly, one has to deduct that country's share in the capitalized seignorage profits of the ECB *after* the introduction of the Euro from its capitalized seignorage profit without the Euro. We will rely on a stationarity assumption[17] which is also found, if only implicitly, in Sinn and Feist. Under stationarity, the volume of seignorage before EMU is also the volume we would obtain at the times of EMU, but without the Euro. Therefore, the capitalized seignorage loss for Germany is

$$V_D^m = G_D^v - \rho_D \sum G_i^n. \tag{1}$$

Here, ρ_D is Germany's share in the ECB and, consequently, its share in the seignorage pool. In this expression appear monetary base variables *before* und *after* the introduction of the Euro. If there were no seignorage pooling, the capitalized seignorage loss of Germany would total

$$V_D^o = G_D^v - G_D^n. \tag{2}$$

This loss would reflect both the German loss of competitive advantage on the international market for monetary base and the (possible) difference in the quality of the Euro and the Mark.

A country does not participate in seignorage pooling with its outdated, historical monetary base of the period *prior* to the introduction of the Euro, G_i^v, but with the current actual monetary base *after* its introduction, G_i^n.

[16] A negative loss is, of course, a profit in the usual sense.

[17] By assumption, the introduction of EMU is the only event disturbing the stationarity. Growth and other factors unrelated to EMU are excluded.

Therefore, the capitalized German *net transfers* due to pooling of the capitalized seignorage profits amount to

$$T_D = G_D^n - \rho_D \sum G_i^n. \tag{3}$$

As opposed to capitalized seignorage *losses*, the capitalized net transfers on account of seignorage pooling are calculated exclusively on the basis of monetary base data from the time *after* the introduction of the Euro. Obviously, we have

$$T_D = V_D^m - V_D^o \tag{4}$$

and

$$V_D^m = T_D + V_D^o. \tag{5}$$

In contrast, Sinn and Feist's calculations of German losses are based on the formula

$$SF_D \equiv G_D^v - \rho_D \sum G_i^v, \tag{6}$$

or, more generally, for any country j on

$$SF_j \equiv G_j^v - \rho_j \sum_i G_i^v, \qquad j = 1, ..., n. \tag{7}$$

Note that since the shares ρ_j sum to 1, the SF_j add up to zero.[18]

While $\sum T_j = 0$ holds by construction, $\sum V_j^m = 0$ requires

$$\sum G_i^n = \sum G_i^v \tag{8}$$

to hold. Equation (8) is our expression for assumption 1.

C Proof of error compensation

In the spirit of Sinn and Feist we interpret the transfer payments, T_D, as an estimate of the seignorage loss, V_D^m, with an error of measurement $e_{1,D}$ given by

$$T_D = V_D^m + e_{1,D}. \tag{9}$$

Likewise, G_D^v may be viewed as an estimate of G_D^n, and $\sum G_i^v$ as an estimate of $\sum G_i^n$ with errors of measurement $e_{2,D}$ and $\frac{1}{\rho_D} e_{3,D}$, respectively, defined by

$$G_D^v = G_D^n + e_{2,D}, \tag{10}$$

$$\sum G_i^n = \sum G_i^v + \frac{1}{\rho_D}\ e_{3,D}. \tag{11}$$

[18] Replacing subscript D by subscript j in equations (1) - (6) gives the corresponding formulas for country j.

Sinn and Feist's calculation of German losses on the basis of (6) may then be decomposed as follows

$$
\begin{aligned}
SF_D &= G_D^v - \rho_D \sum G_i^v && (12)\\
&= \underbrace{G_D^n - \rho_D \sum G_i^n}_{T_D} + \underbrace{(G_D^v - G_D^n)}_{e_{2,D}} + \underbrace{\rho_D \sum (G_i^n - G_i^v)}_{e_{3,D}} && (13)\\
&= T_D + e_{2,D} + e_{3,D} && (14)\\
&= V_D^m + e_{1,D} + e_{2,D} + e_{3,D}. && (15)
\end{aligned}
$$

Consequently, SF_D is an estimate of V_D^m that incorporates three error terms. It is also an estimate of T_D with two error terms. Clearly, SF_D correctly estimates V_D^m if the three error terms sum up to zero,

$$e_{1,D} + e_{2,D} + e_{3,D} = 0. \tag{16}$$

The validity of this equation will now be evaluated by means of the critical assumptions in two steps.

Step 1: In view of (8) and (13), assumption 1 implies

$$e_{3,D} = 0. \tag{17}$$

Using (1), (6), and again (8), we have consequently

$$SF_D = V_D^m. \tag{18}$$

Step 2: Given (18), equation (15) in conjunction with (17) implies then immediately

$$e_{1,D} + e_{2,D} = 0, \tag{19}$$

which shows that the two errors, $e_{1,D}$ and $e_{2,D}$, indeed cancel. Note that this result would hold for any country j as long as one relies on the same set of assumptions.

D Faulty measurement of (transfer) payments

From equation (14) it is clear that Sinn and Feist's estimates of SF_D miss the true transfer payments, T_D, by the two types of errors $e_{2,D}$ and $e_{3,D}$. There is no presumption that these two errors compensate; on the contrary, they may accumulate. Even with assumption 1, the estimate SF_D still misses T_D by the error $e_{2,D}$, and this error may as well be large due to the oligopolistic indeterminacy mentioned in the text.

E German losses in case of positive payments from the EMU seignorage pool to Germany

Equation (5) shows that a German loss (i.e. $V_D^m > 0$) may coincide with a negative or zero transfer payment ($T_D \leq 0$). In this case, a positive V_D^o is outweighing a negative or vanishing T_D. In such a situation the German seignorage losses from the loss of the competitive advantage would be so large that they would have to be compensated from the EMU seignorage pool. But the pooling implies only a partial compensation and the losses will outweigh the transfers from the pool.

F Conclusion

The calculations of Sinn and Feist, SF_j, are acceptable as an estimate of the seignorage losses, V_j^m. They are not acceptable as calculations of the capitalized net transfers, T_j.[19] The Sinn-Feist statement "Without pooling, no losses" implies that $V_j^m = 0$ follows from $T_j = 0$. This implication is clearly wrong.

[19] Note again that V_j^m may be positive while the corresponding T_j is zero or negative.