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## **THE PROBLEM OF SWISS FRANC-INDEXED LOANS: ON BROADER ECONOMIC AND FISCAL EFFECTS OF THE PROPOSED SOLUTIONS**

### **Abstract**

The problem of Swiss franc-indexed loans has so far been viewed by actors as a zero sum game – redistribution between creditors and debtors. This view failed to cover complex economic and financial relations associated with the problem. For example, losses at the banks' expense imply that banks would pay less income tax to the budget. On the other hand, reduction of the repayment burden implies higher private consumption and avoidance of a drop in VAT and other public revenues. This leads to the question of what is the relationship between total losses and gains for both the budget and the economy as a whole.

While statistical gains and losses for individual actors can be identified relatively easily, the dynamic relationship between gains and losses for the budget and the economy as a whole cannot yet be calculated. The form and net amount of total effects depends on a number of economic relations that no one has yet attempted to estimate. Although this analysis does not provide such an estimate, it points to a conceptual structure of the model and methodological paths that could lead to this estimate in the future. It is not too late for such an estimate as the issue of the final calculation of costs for the solution to the Swiss franc problem will remain open for a long time.

*The opinions and findings expressed in this document do not represent the official views of the Croatian Banking Association. The analysis has been prepared by Arhivanalitika for the Croatian Banking Association.*

## INTRODUCTION

A review of solutions applied to the Swiss franc problem has shown that there are great differences among countries (CBA Analysis No. 53)<sup>1</sup>: from letting creditors and debtors agree on a solution (Austria, Bosnia and Herzegovina, Slovenia and Romania), through strong government intervention (Hungary, Croatia) to hybrid solutions that combine agreements between creditors and debtors with "soft" government intermediation (Serbia).

After the release of CBA Analysis No. 53 (July 2015), Croatia resorted to an extremely interventionist solution under which debtors are put in a position they would have been in had they initially obtained euro-indexed loans (with repayment of the "overpaid" amount). An interventionist solution is currently being discussed in the Polish parliament as well. The first Polish solution resembled the Croatian solution of loan conversion to euro, but has been modified through negotiations of the concerned parties. According to the information available at the time of writing this paper, the Poles decided to divide the costs of converting Swiss franc-indexed loans equally between creditors and debtors, but only for debtors who bought "normal" size real estate (apartments up to 100 m<sup>2</sup> and family houses up to 150 m<sup>2</sup>).

After the adoption of the final solution for conversion to the euro at the initial exchange rate, the following legal issues have come to the forefront in Croatia: are the conversion regulations<sup>2</sup> in compliance with the Constitution; can the solution be disputed before a foreign court or by means of arbitrage; and who will ultimately pay the costs of conversion should the regulations be found to be unsustainable? This paper does not address these legal issues. Instead, it focuses on another topic that has yet failed to become the focal point of the discussion, i.e. the topic of total social (above all fiscal and economic) effects of the proposed solutions. More specifically, while statistical gains and losses for particular actors or groups of actors can be identified relatively easily, the dynamic relationship between gains and losses for the budget and the economy as a whole cannot yet be calculated. The form and net amount of total effects depends on a number of economic relations that no one has yet attempted to estimate.

Such an analysis would not be necessary if regulations were adopted following public consultations and appropriate estimates of effects. However, the absence of these tools has led to a situation where (not only in this case) solutions are adopted exclusively based on political power relations at a given political moment, irrespective of net social (above all, fiscal and broader economic) effects.

It may seem to readers that this type of discussion/analysis makes no sense now that all key decisions have been adopted. However, an *ex post* analysis of the Swiss franc case may provide lessons about the methods to be used in finding solutions in the future. It may also provide a deeper insight into the issue of distribution of costs in a

*This analysis focuses on setting up a methodological framework for a comprehensive assessment of social costs and benefits of solving the problem of conversion of Swiss franc-indexed loans.*

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<sup>1</sup> [http://www.hub.hr/sites/default/files/cba\\_analysis\\_53\\_-\\_chf.pdf](http://www.hub.hr/sites/default/files/cba_analysis_53_-_chf.pdf)

<sup>2</sup> This refers to the Act on Amendments to the Credit Institutions Act and the Act on Amendments to the Consumer Credit Act, adopted by the Croatian Parliament at its session on 18 September 2015.

society (the issue that will continue to be raised for a long time in relation to Swiss franc case).

A broader picture of the consequences of the solution to the Swiss franc problem is not seen easily. The problem has so far been presented and perceived exclusively through the creditor-debtor relationship, as a zero sum game in which moral and legal (and thus political) categories should ultimately play a decisive role in making conclusions about who is right and who is wrong.

However, the method of dividing the costs of the solution to the Swiss franc problem between concerned parties cannot be understood without a broader picture that shows economic motives, interests and responses of the actors involved. This also includes broader interests of taxpayers. The effects on the government budget arise even without the explicit intention of actors (as they are most often second and higher order effects).

In addition, consideration of broader effects cannot be limited only to the government budget and focus only on variations in debtors' consumption (and variations in associated VAT revenues) and variations in income tax payments by the banks. It is necessary to analyse much broader fiscal and economic effects, including the impact on the credit market, interest rates, international reserves, exchange rate, financial stability, and induced economic activity.

Such a comprehensive consideration of the effects of the solution to the Swiss franc problem requires the use of modern economic techniques and knowledge, which are here described only in main elements, without many details. So the calculations presented do not have the character of estimates and their purpose is only to illustrate the application of certain models. These are the models whose results cannot be ignored when searching for an informed solution in a developed democracy.

The remainder of the paper is organised as follows. A model describing economic effects, including the fiscal ones, is first presented on a conceptual level. The illustration in the first chapter begins with an application of the zero sum game to the problem of creditor-debtor relationships. In the second chapter the model is broadened to a conceptual illustration of comprehensive effects, while in the third chapter an attempt is made to quantify some elements of the model, not in an effort to make relevant estimates but in order to illustrate the calculation. The final chapter concludes and provides guidance for future analysis.

*The Swiss franc problem has so far been presented and perceived exclusively through the creditor-debtor relationship. Most people adopted this attitude, thus neglecting broader social – as well as economic and fiscal – consequences.*

## I ZERO SUM GAME

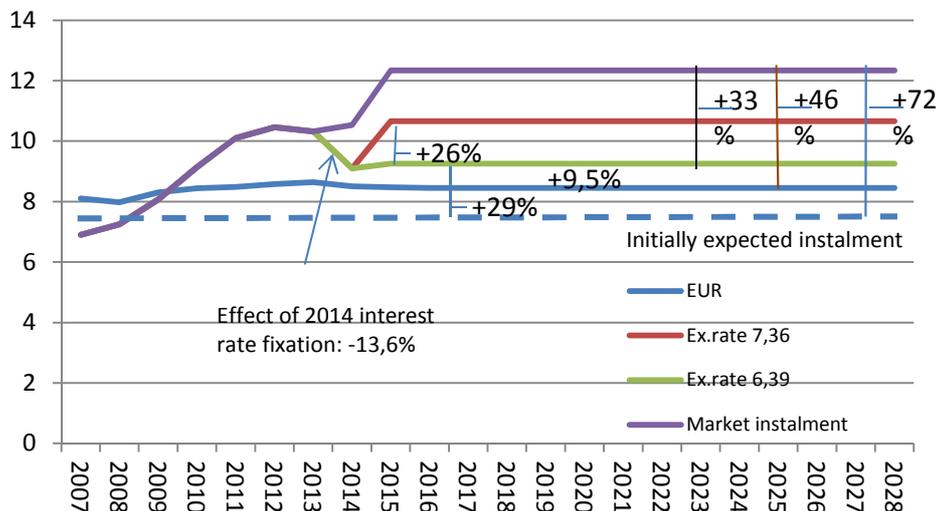
The currently dominant view of the problem – which only sees the conflict of interest between creditors and debtors – may be described as a zero sum game.

The zero sum game includes only two “players” – creditors and debtors. They bargain over the division of the cake whose size is supposed to be invariable. The relationship is described from a debtor's perspective, which is explained in detail in CBA Analysis No. 53 (for this reason the technical aspects of the calculation for a typical loan used in the illustration below will not be dealt here in detail).

Debtors strive to repay a loan at the amount represented by the initial (dashed) blue line, in line with expectations at the time of concluding the loan as if they have not assumed any market risk involving exchange or interest rate changes. Therefore, any repayment in an amount exceeding the dashed blue line represents a subjective loss for the debtor. On the other hand, a creditor deems that the money would not in the first place be entrusted to a debtor who is not informed and has no creditworthiness. Therefore, any repayment of an amount below the highest market instalment represents a loss for the creditor. This appears to be all that is relevant in a zero sum game; this picture contains no other actors whose behaviour is affected by the various aspects of this business relationship.

*Earlier interventions concerning interest rates and the accounting exchange rate considerably reduced the actual instalment relative to the market instalment of a representative loan. The proportion of burden distribution between creditors and debtors depends on the way a debtor interprets a reference (desired) instalment.*

Figure 1 Relationships between annual annuities under different variants of a representative loan repayment



The full blue line in Figure 1 shows the repayment of an equivalent euro-indexed loan which is the base for final solution in Croatia. However, at the beginning of CHF crisis the debtors did not compare their actual instalments with a hypothetical instalment of a euro-indexed loan. The initial demand of the debtors' association *Franak*, was conversion to kuna loans at the exchange rate applicable at the time of loan

approval. Therefore, in the region between the dashed and the full blue lines, there is a zone of uncertainty where debtors are not certain which value should be used as a reference (initial, desired) instalment for a comparison from which they derive their political demand for compensation. In the final run, compensation is to be made at the amount shown by the full blue line – as if the loans were extended with EUR f/c clause, which satisfied the debtors judging from the way the Franak association welcomed the solution.

The vertical lines in the figure above show the difference between the highest market instalment (the one that has never been paid as it implies the payment of a market interest rate at a market exchange rate of the kuna against the Swiss franc), the initial instalment and actually paid instalments. The hypothetical market instalment is higher than the initial instalment of a Swiss franc-indexed loan by 72% and by a much lower 46% than instalment on euro indexed loan.<sup>3</sup> The actual instalment paid by the debtors before the September conversion was less than the market instalment because of the application of the reduced (fixed) interest rate of 3.23% as of January 2014 (*ceteris paribus*, the effect of interest rate fixation amounted to 13.6% of a representative loan instalment<sup>4</sup> - see figure 1) and fixation of the administrative CHF/HRK exchange rate for calculation of instalments at 6.39 as of January 2015. This is why the hypothetical market instalment was higher than the one actually paid through to August 2015 by 33%, and the difference between these instalments created costs for banks. This means that banks have borne some of the costs of changes in market conditions as early as from the beginning of 2014.<sup>5</sup>

It is also noteworthy that after the temporary solution involving the administrative CHF/HRK exchange rate fixation at HRK 6.39 in January 2015, the actual instalment of a loan indexed to the Swiss franc was only 9.5% higher than the hypothetical (equivalent) instalment in euro (see figure 1). However, the September 2015 solution introduced the principle of equivalence with euro-indexed loans. *De facto*, the difference of around 9.5% between a January instalment and an instalment of an equivalent euro-indexed loan has been removed. Debtors will continue to repay the loan at an amount represented by the lower full blue line, with one important additional factor: they are to receive the “overpaid” amount. Creditors must reimburse the debtors as if the loan has been initially indexed to the euro.

In the figure 1, “overpaid amount” is defined as the difference between the purple line, which goes down the green line after the interest rate correction in 2014, and the full blue line before September 2015. This difference is approximately equal to

*Depending on the choice of a reference instalment, distribution of the burden of the franc appreciation between debtors and creditors becomes indeterminate as both debtors and creditors have their own "zone of uncertainty" where it is unclear which instalment and at what conditions should be chosen as a reference for the calculation.*

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<sup>3</sup> No one has ever paid the market instalment; i.e. the instalment which would be paid at the market interest rate of 5.35% and the market CHF/HRK exchange rate of 7.36, which was applicable in late January 2015 when the Swiss National Bank abandoned the ceiling on the franc.

<sup>4</sup> For more details on a representative loan, see CBA Analysis No. 53.

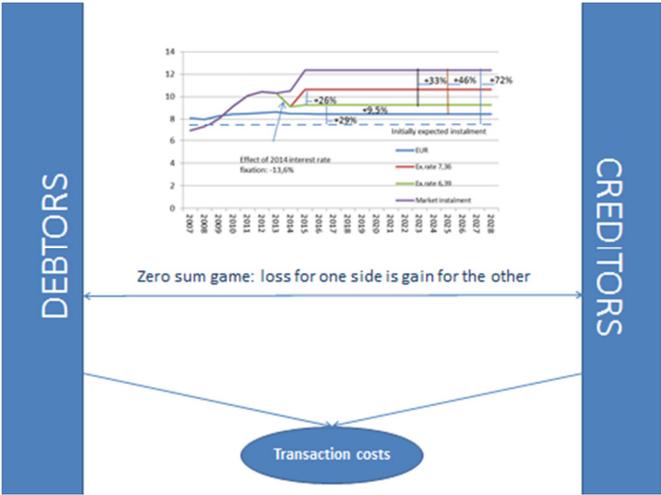
<sup>5</sup> This represents gross costs. Net costs could (in theory) be calculated by reducing gross costs by the costs of default, which would certainly be much higher at market terms than the already high costs of default on Swiss franc-indexed loans.

8% of the initial principal amount.<sup>6</sup> Therefore, the September 2015 solution of loan conversion involves the cost for banks of around 8% of the initial principal, to be increased by 9.5% of the outstanding value of annual annuities. The CNB estimated that total costs will be up to HRK 8bn.<sup>7</sup>

*Even without government intervention, creditors would be inclined to be lenient to debtors, provided that transaction costs are high and that the deterioration of the recovery rate after a change in market conditions is sufficiently strong.*

At market conditions, not all loans would be repaid with interest. Losses arising from default and enforcement actions would be substantial, but their size is difficult to estimate. The only thing that is certain is that in the figure above the reference instalment for a creditor is somewhere below the market (highest) line and above the green line at which instalments have been calculated after January 2015.<sup>8</sup> Default and enforcement costs are the reasons why even without government intervention, creditors would be inclined to be lenient to debtors (e.g. reschedule loans to debtors experiencing loan repayment difficulties or finance various assistance schemes, such as sale and leaseback arrangements) in order to avoid up front losses. This creates a problem that is complex and partly indeterminate with respect to reference instalments, though it is still defined in the simplest possible framework called a "view of the zero sum game" (Figure 2). In this view there are only creditors and debtors. There are no other actors and the only relevant "complication" involves costs of default that increase as market conditions deteriorate. Therefore, creditors are faced with costs other than direct costs of default, such as reputation costs, transaction costs of enforcement actions and opportunity costs of the time managers devote to solve old problems instead of creating new business solutions.

Figure 2 View of the zero sum game



<sup>6</sup> Once again, the reader is asked to bear in mind that all calculations presented here have only an illustrative purpose and cannot be interpreted as relevant estimates. They apply only to a specific case of a loan used in the example. As any actual loan is more or less different from the example, the only way to make a relevant estimate is to consult creditors.

<sup>7</sup> CNB report of 15 September 2015: [http://www.hnb.hr/priopc/2015/hrv/hp15092015\\_CHF.pdf](http://www.hnb.hr/priopc/2015/hrv/hp15092015_CHF.pdf). Note that this is gross cost concept.

<sup>8</sup> The reference instalment for creditors is the market instalment net of expected losses. The losses are hypothetical as they would arise if debtors have continued to repay loans at market conditions.

The uncertainty of positions of the parties in the presented relationship arises from their subjective interpretations of gains and losses. These interpretations have no connection with legal interpretations. Therefore, the latent conflict that arises from subjective interpretations is natural in any permanent relationship of exchange. However, the existence of this conflict based on subjective interpretations does not mean that the relationship between the concerned parties cannot be objectified.

The parties themselves cannot attain objectivity. A new actor is needed – a third party or a fair intermediary – who will attempt to alleviate or solve the latent conflict by bearing in mind the views of both parties to an extent it makes sense relative to a predetermined, objective criterion.

In terms of the zero sum game, the government and/or a regulator can play the role of an intermediary (as in Croatia when the Memorandum of 2011 was drafted – see CBA Analysis No. 53). It can also intervene when it assesses that creditors and debtors are for some reason unable to reach a reasonable agreement (e.g. in Croatia when interest rates were fixed in 2014, when the accounting exchange rate was fixed in January 2015, or when the ultimate CHF – EUR conversion solution was adopted in September 2015).

In all such cases the government can act in two ways. First, it can be a fair intermediary who will view the whole picture from all sides, weighing carefully all possible solutions and their consequences for the parties concerned and the society as a whole (taking care after public interest). Second, the government can act as an ultimate political arbiter in a politicised dispute in which players in the zero sum game participate. In that case, the solution provided by the government inevitably includes its own political calculation, which is materialised in the expected number of voters. However, this government's role is problematic as actual economic flows and relations are much broader and more important than flows illustrated in the above model of the zero sum game. If the government is to play the role of a fair intermediary and an articulator of the general public interest, it needs to have at its disposal adequate analytical tools that enable a comprehensive overview of the problem and consequences of various solutions. These tools are presented in the analysis below.

*The government also appears in the zero sum game, not as a player that introduces a new (broader) economic perspective, but as an intermediary or an arbiter who judges the dispute or helps in reaching an agreement, driven exclusively by political motives.*

## II CONCEPTUAL ILLUSTRATION OF A COMPREHENSIVE ECONOMIC MODEL

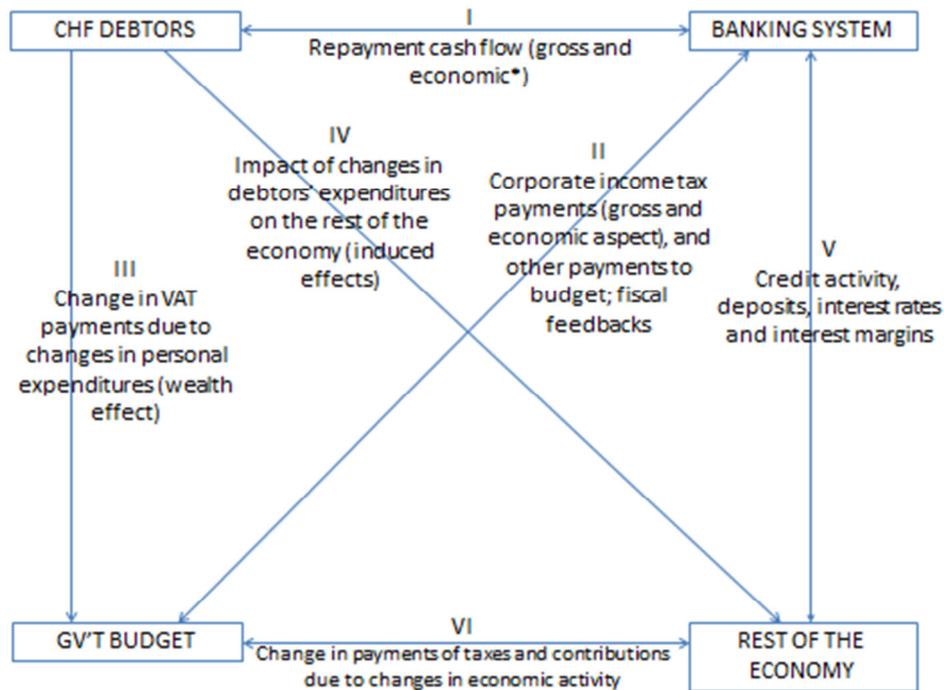
There is a wide spectrum of economic issues that arise in relation to the solution to the Swiss franc problem. These questions remain unanswered even today, when the solution to the conversion problem is known, as no one has ever tried to articulate them during the discussion on the Swiss franc problem. The questions are as follows:

1. What is the balance sheet effect (wealth effect), i.e. how does the drop in the net present value of debtors' assets (due to Swiss franc appreciation and/or a decrease in real estate value) affect debtors' decisions on consumption and investments? Or vice versa: how does the increase in the net present value of debtors' assets caused by Swiss franc depreciation or an increase in real estate value or government intervention in loan instalments, affect debtors' decisions on consumption and investments?
2. In relation to the above, what is the effect of the induced slump in private consumption and investments on tax revenues? Or vice versa: what is the effect of the induced increase in private consumption and investments on tax revenues?
3. How does the burden to be paid by the banks affect corporate income tax revenues and banks' behaviour in the market?
4. How to evaluate the solution to the Swiss franc problem from the standpoint of its impact on total consumption, investments, real estate market and banking system stability, and particularly from the standpoint of the impact on the exchange rate and international reserves?
5. In relation to the above, how are expected effects translated to fiscal and broader economic effects?

*When solving the Swiss franc problem, account should be taken not only of the relationship between creditors and debtors, but also of how is that relationship reflected in five other economic relations: between banks and the budget, debtors and the budget, debtors and the rest of the economy, the rest of the economy and the budget, and banks and the rest of the economy.*

Figure 3 below replaces the model of zero sum game. It shows that the bilateral relationship between creditors and debtors is part of a much broader network of economic and social relations. The network includes new actors: the government (budget), the banking system and "the rest of the economy". There are six big groups of relations in the network and losses and gains arise along each of these groups.

Figure 3 A broader picture of interrelations between actors (not a zero sum game anymore)



\*The economic flow of repayments is equal to gross bank claims net of the unrecoverable amounts. The odds of default increase when the currency to which a loan is indexed appreciates. Relation number I in the above scheme is equivalent to the illustration in Figure 2 – zero sum game.

The first group of relations, denoted by the Roman numeral I, has already been discussed. It involves the creditor-debtor relationship.

The second group comprises relations between banks and the budget. For example, 20% of any loss borne by the banks represents foregone corporate income tax revenue, i.e. the cost to taxpayers. This is the amount of income tax that will not be collected due to smaller profits or losses of the banks, arising from costs representing tax deductible expenses.<sup>9</sup>

Furthermore, a change in the model of repayment also affects the economic behaviour of debtors (consumption, investments, and savings), which will again affect the budget (group of relations III: e.g., increased consumption leads to larger VAT revenues). The effects spread further in concentric circles: the rest of the economy reaps the benefits from larger private consumption as sales go up (group of relations IV), which in turn affects bank profits (group of relations V: e.g., demand for bank loans grows) and the budget (again relation II and relation VI), etc.

*Changes in expected repayments affect the budget through the wealth effect as people adjust their private consumption to a subjective assessment of changes in the net value of personal assets (relations III, IV and VI). Still, the overall effects go even further.*

<sup>9</sup> Even that calculation is not so simple. As stressed earlier, the actually lost amount of tax revenue will be lower as gross losses on income tax (20% of the basis alone) should be reduced by the portion of income tax revenues that would not be collected anyway as more claims would remain unrecovered at market terms compared with the terms following the conversion.

However, if positive effects on banks do not outweigh the negative ones (losses), a question arises of how will banks respond in terms of interest rate policy (will they raise interest margins – relation V again) and the credit supply (would it be reduced – relation V again). There is also the issue of the effect on foreign currency demand, exchange rate and foreign exchange reserves.

The effects thus spread through the second, third and further orders of effects. Moreover, the changes reflected in the budget may trigger a change in the fiscal policy, so that this can also become a generator of waves in the presented network. This is an extremely complex system and analysis would have to be based on a sophisticated model of effect propagation.

By all means it is easier to understand and interpret the effects of various measures by means of a conceptual model constructed in this way rather than by means of a zero sum game. One may think of a solution (e.g. a considerable reduction of the debtors' repayment burden at the banks' expense), which creates positive effects in the first instance (which through relations III, IV and VI offset the negative effect acting through relation II), but then destabilises the banks which, through relations V, VI and II, offsets positive effects, so that the total net effect enters the negative zone. One can see now that the zero sum game may become a game with a positive or a negative sum, depending on the nature of the intervention.

Destabilisation of banks may assume various forms – from excessive depletion of international reserves, which may reduce the confidence in the system and trigger a long-lasting depreciation of the domestic currency (creating second-round effects on most economic actors, in particular debtors with loans indexed to other currencies), through excessive losses that deteriorate the capital adequacy and tighten lending conditions in the market (e.g. an increase in interest rates, reduction in the credit supply), to excessive write-offs that would trigger the strategic behaviour (moral hazard) of other debtors.

On the other hand, it is possible to conceive a prudent solution that would strike the right balance between positive effects on the behaviour of debtors – consumers, and negative effects acting through the financial system, so that the total net effect is ultimately positive. The achievement of such a balanced solution is not a matter of ingenuity or political know-how, but of simulations based on economic analysis. Without analysis a good solution can only be stumbled upon.

The presented conceptual model (Figure 3) does not enable precise calculations but opens room for discussion about some of the solutions applied in other countries where debtors were affected by the Swiss franc appreciation. For example, the first measure applied in Hungary in 2011 was early repayment of loans at a preferential exchange rate, which entailed a 25% write-off.<sup>10</sup> The measure was conceived to have a positive impact through relations II, IV and VI. It was expected that the effects along these lines would be stronger than negative effects through relations II and V.

*As the CNB estimated that conversion costs for the banks would reach up to HRK 8bn, or around 15% of banks' capital, a question arises within the presented model about the impact on the budget through lost tax revenues, on the behaviour of banks – their interest rate and credit policies and, most importantly, the behaviour of debtors as consumers.*

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<sup>10</sup> See CBA Analysis No. 53.

However, this solution failed to take account of the fact that it would destabilise the market exchange rate of the forint, which created a negative feedback effect through relation V and, more importantly, through relation I: the weaker forint increased the credit burden (and reduced the net value of personal assets) for most debtors who did not use the early repayment option in 2011. Therefore, private consumption contracted following the steep fall in the forint (see CBA Analysis No. 53).

A similar effect would be made by the forced conversion into the domestic currency in conditions when international reserves are not adequate. Such conversion would lead to the fall in the value of the domestic currency and, in turn, raise the repayment burden for all other debtors with foreign currency-indexed contracts.

The Croatian solution of September 2015, which is based on the conversion to the euro according to the principle of equivalence (debtors ultimately pay the amount they would have paid for a loan initially indexed to the euro), will probably not have effects on the exchange rate similar to those in Hungary as it does not involve the conversion to the domestic currency. However, as the CNB estimated that costs for banks would reach up to HRK 8bn, or 15% of the banks' capital, close to 3 years of earnings, a question arises within the presented model about the impact on the budget through lost tax revenues, on the behaviour of banks – their interest rate and credit policies and, most importantly, on the behaviour of debtors as consumers, i.e. how much will their private consumption increase and what will be the feedback effect on budget revenues. These are only first-round effects. In the second round, each first-round change in behaviour affects all other related actors in the complex system. For example, the CNB estimated that it would have to spend around EUR 0.88bn of foreign exchange reserves to prevent rapid exchange rate depreciation as banks will have to close their foreign exchange positions.<sup>11</sup>

The presented change in the perspective completely changes the perception of the problem. It is now clearly obvious that a solution which would be neutral for the government budget and the economy as a whole has never been possible even in the zero sum game. The budgetary perspective has been excluded from the discussion as it was in the interests of certain parties to leave the fiscal effects out of considerations. However, a comprehensive model represents a framework within which it is now possible to determine the public interest after considering all relevant effects. A comprehensive model allows, at least in theory, a distinction between good solutions – those that would induce all actors to create larger value added, and bad solutions – those that would finally lead to a negative sum game. However, there is a long and hard way from theory to practice, which is shown in the next chapter.

*In order to act according to public interest government has to have an economic model showing implications for various potential solutions.*

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<sup>11</sup> [http://www.hnb.hr/priopc/2015/hrv/hp15092015\\_CHF.pdf](http://www.hnb.hr/priopc/2015/hrv/hp15092015_CHF.pdf).

### III ON THE MODEL APPLICATION

It is very difficult to translate a broader picture to figures as the model at hand is a dynamic complex system. The construction of such a model – a classical econometric model or a network model – requires long months of work by an expert team. As there is no similar model in Croatia that would integrate a macroeconomic model with a model of financial system behaviour, the paper of a limited scope such as this one is necessarily limited to mere (and unreliable, i.e. only illustrative) indications of the results.

An objection could here be addressed to all the parties involved – in particular the government and the Croatian National Bank – for failing to develop an economic model whose results would inform decision makers and the general public about relevant effects of the solution to the Swiss franc problem. In that sense, this analysis comes too late, though it will have an *ex post* value for the purpose of better understanding the final distribution of the costs involved in the Swiss franc case.<sup>12</sup>

In this chapter, the model application is illustrated by an analysis of the relation between tax losses that arise from losses of banks and tax gains that arise from gains of debtors whose loan instalments are reduced.

This concerns the wealth effect. In particular, changes in the present value of expected flows from loan payments, which arise from changes in the exchange rate used to calculate instalments and/or interest rates, may be translated to changes in the present value of personal net wealth. In turn, the latter changes affect the decisions of households about consumption and investments: a feeling of growth in net wealth encourages spending and vice versa. Larger spending in turn has a favourable impact on the growth in economic activity and budget revenues.

Changes in the present value of personal net wealth (net assets) may be observed as equivalents to changes in the market value of real estate. This is why existing estimates of the effect of changes in the real estate value on private consumption may be used as the first approximation of the effect of changes in the present value of expected instalments on private consumption, GDP and budget revenues.<sup>13</sup>

Table 1 shows changes in the present value of debtors' net assets calculated for the remaining 12 years of repayment of a 22-year loan with a discount rate equal to the initial interest rate on the loan.<sup>14</sup> The difference between the instalments relative to the initial instalment is 48% when instalments are calculated at the exchange rate of HRK 7.36 for one franc or 29% if instalments are calculated at the fixed administrative exchange rate of HRK 6.39 for one franc. Therefore, the earlier

*Changes in annuities arising from changes in market values may be translated to changes in the present value of debtors' net assets. These changes induce changes in economic behaviour, primarily with regard to consumption decisions.*

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<sup>12</sup> Research issues that should be addressed in the future in order to better estimate economic effects of the solution to the Swiss franc problem are listed at the end of the analysis.

<sup>13</sup> As changes in the present value of expected repayments occur simultaneously with the fall in the value of real estate it is questionable whether these effects can be seen as additive. An analysis of such a relationship goes beyond the scope of this paper.

<sup>14</sup> For more details, see CBA Analysis No. 53.

government's decision to fix the administrative exchange rate at below the market value reduced the fall in the present value of debtors' net assets relative to the initial instalment, from 37% to 22%. In other words, if instalments were calculated at the market exchange rate (the red line in Figure 1), debtors would further reduce private consumption (which would reduce VAT-related budget revenues). Finally, the change in the present value of debtors' net assets in the conversion model of September 2015 relative to the instalment defined under the conditions of January 2015 is an additional (around) 9%.

*The total effect of government interventions in 2015 is translated into an increase in the present value of debtors' net assets of around 16% in the presented model for a 22-year housing loan, the repayment of which has begun in 2007.*

*Table 1 Changes in the present value of debtors' net assets due to changes in lending conditions*

	Difference between instalments, in %	Change in the present value of debtors' net assets, in %
Relative to the initial rate at the exchange rate of:		
7.36	48%	37%
6.39	29%	22%
Relative to the equivalent instalment in euro at the exchange rate of:		
7.36	26%	24%
6.39	10%	9%

Source: CBA Analysis No. 53.

Two other problems need to be solved in order to use the presented estimates of changes in the net wealth for an assessment of the effect on the debtors' consumption behaviour. First, for the purpose of comparison, it is necessary to define the reference instalment that affects consumption behaviour. Second, the change in the net wealth should also include the effect of overpayment defined in the September solution, which is estimated at around 8% of the initial principal in the loan model. (Earlier overpayment may be used to reduce future instalments by up to 50% of their amount, until the effect of overpayment is completely exhausted.)

The reference instalment for comparison purposes that affects behaviour is definitely not the one calculated under market terms (as no one has ever paid such an instalment). Reference to a market instalment is a reminder of what effects could have been expected in the absence of prior interventions. Therefore, the effect of the September solution may be viewed through the change in the present value of net wealth relative to the calculation made at the CHF/HRK exchange rate of HRK 6.39 (the last line in the table above – effect of 9%).

The estimated effect shown in the table should be increased by the effect of the return of the overpaid amount. When the estimated amount of overpayment of 8% of the initial principal is used to the maximum for reducing future instalments by 50% until overpayment is exhausted in full, the change in the present value of debtors'

net assets in the model of a 22-year housing loan stands at 16% (an effect of around 9% of the present value of expected instalments plus an effect of around 7% of instalment reduction up to 50% in 2016 and 2017 until overpayment is exhausted).

The following question arises: how does the calculated change in the present value of debtors' net assets affect the economic behaviour of households, in particular their consumption behaviour?

Ahec Šonje, Čeh Časni and Vizek (2012, 2014)<sup>15</sup> estimated the (long run) elasticities of real private consumption on real estate prices at 0.07. This means that private consumption will (permanently) change by 0.07% for each percentage change in real estate prices.

Therefore, if the fall in the present value of the difference in cash flows of repayments is interpreted as equivalent to a 16% increase in real property prices, it arises that associated with that change is a permanent change in real private consumption of around 1.1% ( $=0.07 \cdot 16$ ), which will provide a boost to budget revenues. On the other hand, budget revenues arising from corporate income tax will be reduced due to lower profits of banks.<sup>16</sup> The CNB estimated that banks' losses would amount up to HRK 8bn.<sup>17</sup> Assuming tax deductible expenses and the usual possibility to carry forward tax losses over a five-year period, 20% of estimated losses represent lower budget revenues. On the basis of slightly less than HRK 8bn, this amounts to around HRK 1.5bn of lost taxes.

Therefore, the following question arises: is the expected loss of HRK 1.5bn in income tax revenues compensated by larger expected VAT revenues due to the expected increase in private consumption by the estimated amount of 1.1% for families with Swiss franc-indexed loans?

It is first necessary to estimate the share of households with Swiss franc-indexed loans in total consumption of Croatian households. Around 4% of Croatian households have such loans and they were creditworthy at some point in time. The mere fact that they decided to raise a loan to buy real estate shows that they are, on average, more affluent families. Their share in total private consumption is not known but it may be benevolently assumed to be much above 4%, at around 10%. Therefore, the product of that share, calculated wealth effect (1.1%) and total private

*The estimated real effect of government measures in 2015 on consumption of indebted households amounts to 1.1%.*

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<sup>15</sup> Ahec Šonje, A., A. Čeh Časni and M. Vizek (2012): *Does housing wealth affect private consumption in European post transition countries? Evidence from linear and threshold models*. Journal of Postcommunist Economies, 24(1): 73-85; and Ahec Šonje, A., A. Čeh Časni and M. Vizek (2014): *The Effect of Housing and Stock Market Wealth On Consumption in Emerging and Developed Countries*. Economic Systems, 38(3): 433-450.

<sup>16</sup> Including tax and surtax payments related to profit payout. However, as a smaller share of profit is paid out, and the effect of the share paid out abroad depends on the application of agreements on avoidance of double taxation, this is a small effect that can be neglected in this stage of analysis (though it should be examined and taken into consideration in the final calculation).

<sup>17</sup> Press Release of 27 August 2015, available at [www.hnb.hr](http://www.hnb.hr) (reviewed on 9 September 2015).

consumption yields the following positive effect on private consumption arising from the fixation of the accounting CHF/HRK exchange rate:

$$1.1\% * 10\% * \text{HRK } 200.000\text{m} = \text{HRK } 220\text{m}$$

Two hundred and twenty million kuna is an approximate annual amount of the positive effect of conversion on private consumption. The effect of VAT payments to the budget may be approximated by dividing VAT revenues by private consumption, which yields an effective VAT rate of 21%<sup>18</sup>. The multiplication yields a positive effect on public revenues of HRK 46m.<sup>19</sup> All amounts are annual.

If the analysis were to stop at first round effects, it would be necessary to compare budget losses of HRK 1.5bn (which are assumed to be extended through three years, distributed equally at HRK 500m a year) arising from corporate income tax foregone with gains arising from VAT revenues. All amounts should be brought to the present value by using, as in the previous calculations, the discount rate of 4.4%, with the time horizon being the end of the loan repayment period (2028). It is obvious on first sight that HRK 46m through the remaining fourteen years cannot compensate for foregone collection of income tax revenues.

Private consumption should grow three times more – by around 3.3% – for the VAT effect to outweigh the effect of loss in income tax revenues.

However, this calculation is not final. VAT is not the only source of budget revenues. The ratio of total tax revenues and social contributions to GDP stood at 35.4% in 2014. Thus, it is more accurate to multiply the entire increase in GDP and consumption by that percentage, instead of only 21%. Calculated on the basis of the effect of HRK 220m, a positive effect on the budget is HRK 79m. Extending this amount through the remaining 14 years of repayment under the applied loan model and bringing it to the present value provides a net effect whose present value is HRK –565m, which is less than the loss on income tax.

However, if private consumption was to grow somewhat more – by around 2% – the net effect would become positive. This possibility cannot be excluded as estimates based on parameters from previous studies, which are focused on the effect of real estate prices on consumption decisions, are not reliable. Equally unreliable are the figures on the share of households affected by the Swiss franc problem in total private consumption, so that these estimates, as earlier mentioned, should be interpreted as illustrative applications of the method and not as final estimates of actual effects.

The presented logic only marginally (to the extent the calculation includes other tax revenues and contributions) takes into consideration broader effects – higher order

*The illustrative calculation shows the effect of government measures on real private consumption of HRK 220m and on VAT revenues of HRK 42m a year. However, these are only first round effects which are offset against negative effects (loss on income tax revenues of HRK 1.5bn). Both positive and negative effects have further repercussions in the complex model of the real economy.*

<sup>18</sup> According to data for 2014.

<sup>19</sup> It is completely irrelevant for economic analysis whether the increase is actual – materialised cash flow – or avoided reduction – foregone revenue. Economic benefits exist in both cases.

effects represented by complex relations in the conceptual scheme given in Figure 3 above. These effects may have a positive or a negative sign.

Positive effects are those of new consumption – and possibly investment expenditure of households – on other economic activities and taxes paid by them. Negative effects are banks' responses to losses. Namely, the following questions remain open: how will bank owners respond to losses? Will they conclude that the Croatian environment is too risky for their capital? Will banks reduce their lending activity or raise interest margins? What will be the effects of banks' actions on enterprises and households, i.e. will debtors in the future pay for the costs of solving the Swiss franc problem through tighter lending conditions than the conditions that would have prevailed if another solution was chosen?

Without the ambition to provide answers to these questions, one should recognise that induced effects arise also along relation V: both loans and deposits may ultimately decrease (i.e. they may become less favourable for debtors and savers) than they would have been without the transfer of losses to the banks or if they were transferred to a lesser extent. This means that the effects of changes in the repayment model move from relation I to the credit and deposit market along relation V, which, in turn, again affects budget revenues.

In the analysis of this scope it is difficult to estimate the effects along relation V. Particularly difficult is to assess their dynamic nature, effects on the banks' return on equity, risks, the owners' behaviour regarding the allocation of capital, etc. Notwithstanding the difficulties involved, estimates of this type should also include models of bank behaviour, estimates of the functions of loan and deposit demand (segmented by portfolio and product groups) and other similar estimates, including feedback loops (e.g., if debtors pay higher interest rates and if deposit rates are lower than they otherwise would have been, it is also necessary to estimate the effects on depositors' consumption and then feedback effects on the budget in the next round of effects).

The purpose of this chapter was twofold: to familiarise readers with possible applications of the comprehensive model and to show that incidental benefits arising from the wealth effect and costs arising from changes in bank behaviour are reflected in the government budget. In addition, the objective was to indicate a direction for a comprehensive analysis of effects. Such an analysis was absent in all countries dealing with the Swiss franc problem, but without it a government cannot fulfil its role of an articulator of the public interest.

#### **IV IN LIEU OF CONCLUSION**

If the view of the zero sum game is replaced by a more realistic comprehensive view of fiscal and economic effects, one may observe significant broader effects of the solution to the Swiss franc problem on the economy and the budget. Today, after the

*This analysis does not allow firm conclusions to be drawn, but shows that different solutions imply different effects on both the government budget and the economy as a whole.*

final solution has been adopted, this type of view and analysis may seem to come too late. However, the consequences of the solution to the Swiss franc problem will be analysed for a long time. Late is not necessarily the same as too late as a lot can be learned from the present situation, which can improve the quality of policies in the future.

It should be stressed that the mentioned estimates may seem to be complicated but they are not beyond the scope of economic analysis. Economists know how to:

- assess the functions of default and losses arising from changes in conditions of repayment in order to estimate the profit function of creditors;
- estimate the share of consumption of debtors with Swiss franc-indexed loans in total private consumption;
- draft models for various types of loans and repayments according to maturity;
- test the wealth effect by other methods (surveys) in order to estimate the reliability of econometric results and broaden the scope of econometric analysis;
- estimate overall macroeconomic effects, which also refers to induced multiplicative effects covering investment activities of the household sector;
- estimate the functions of demand for loans and deposits by market segments determined depending on the tax treatment (at a minimum separately for enterprises and households);
- estimate credit supply functions; and
- estimate the relations between the credit market and real economic activity.

Integration of the results obtained would provide more reliable estimates than the illustrative ones given in this paper. The absence of the described analytical support – typical for all countries experiencing the problem – partly explains why the solutions applied were so different, why so many experiments were made in their adoption and why some of these solutions proved to be detrimental in the final run for all the parties concerned, including debtors themselves.