

**OPTIONS FOR CZECHOSLOVAKIA'S
HOUSING FINANCE SYSTEM**

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Readily available and affordable mortgage finance by expanding the purchasing power of would-be home purchasers is critical to the development of a market-oriented housing sector. Over the next few years, such finance, by helping to stimulate the demand for new housing, will be a key ingredient for sustaining Czechoslovakia's economic growth. Unfortunately, the distance between the current arrangements for housing finance--very limited funds available at extraordinarily deeply subsidized interest rates--and a sustainable system is great.

The purpose of my presentation is to begin the discussion of options for the development of the mortgage finance system in Czechoslovakia, building on the comments that Mr. Salzman has already made. Many of the options I will mention will be expanded upon in the next two days by other presenters, and so you should really think of this as an introduction and not as the last chance to understand some of this material. My presentation is much narrower than Mr. Salzman's, in that I will concentrate on finance and leave aside the very important legal issues and collateral issues that he raised this morning.

Alternative System Models

Let us begin at the very beginning with the structure of the housing finance system. I want to talk about two models, two system models. Each one must fulfill three functions; it must somehow mobilize funds; it must somehow originate loans and then service them (that is, collect the payments every month, deal with late payments and defaults); and, finally, after the loan is originated, it must find an investor for this mortgage loan.

Chart 1

HOUSING FINANCE SYSTEMS

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	<u>funds mobilization</u>	<u>loan origination and servicing</u>	<u>investment</u>
deposit institution	deposits; contract savings; term loans	deposit institution	deposit institution
mortgage banker	capital; term loans	mortgage banker	bond holders, MBS, secondary markets, other investors

The two models are shown on Chart 1. One is a depository institution model and the second is the mortgage banker model. The deposit institution was traditional in the United States, in the form of savings and loan associations; it was traditional in the UK through the building societies. In a way, it was traditional in all of Eastern Europe under the former regime because the state savings bank was a depository institution that did the lending for housing under this deposit institution model. The depository institution raises its funds mostly through deposits; these deposits either can be the standard passbook time deposits or they can be through a contract savings scheme, such as the Bausparkassen scheme that you are familiar with, and that I believe Schwiebish Halle Bank has been discussing with some Czech banks.

Once depositories have their funds, the same institution, the same savings and loan, if you will, originates the loan and then makes the collections over time. Importantly, the loan originator in this case is also the investor. He makes the loan, and he keeps it in his portfolio. If you look at the assets on his balance sheet, housing loans are the biggest item by far. This is their primary business: they make these investments and they hold them.

The second model is the mortgage banker model, and it works rather differently. Some of you may know that in Denmark this mortgage-banker model has been the standard practice for many years. In the United States, it has been a very important element in the mortgage finance system for perhaps 25 years. In Germany, it is also an important part of its more complicated system. In terms of fund mobilization, the starting money comes from equity, and perhaps additional funds come from term loans, i.e., loans from institutional investors. With this initial money, the mortgage banker originates loans and services them. But once he has originated a loan, he sells it to someone else--either directly by selling a whole loan, or indirectly by selling bonds or other kinds of securities.

In Denmark, these associations sell bonds in the market. There are only three such associations now, but each of them sells a very large volume of bonds on the market. In Germany you know these bonds as the fund Pfandbriefe; and in the United States, Fannie Mae sells this kind of bond (Fannie Mae is the Federal National Mortgage Association, a secondary market operation). The general point is that mortgage bankers sell their mortgages; and with the new money they receive, they make more loans. Their profit comes from origination fees when it makes loans, and from fees for servicing the loans--even when they sell the loan, they retain the servicing responsibility. Importantly, under the mortgage banker model, you can see that one is starting to diversify who is bearing various kinds of risk.

Dealing with the Risks of Mortgage Lending

Understanding the risks involved in mortgage lending and dealing with them efficiently is the heart of mortgage banking. Chart 2 shows the four principal kinds of risks associated with mortgage lending for two sources of funds. I will go through each of these four types of risk, and discuss who bears the risk under each arrangement. The first source of fund is deposits, and let us say that these are short-term deposits; the second source fund is bonds. We have two kinds of bonds, a bond that has a fixed interest rate for the life of the bond and a variable rate bond, for which the interest rate changes as market interest rates change. Using a variable rate bond means that the interest rate on the mortgages must also change as market interest rates change; i.e. if the bond is variable, the mortgage interest rate is also variable.

The first kind of risk is credit risk; this is the risk of the borrower not making his payments. Under the deposit scheme, either the originator bears all of the risk; i.e., the

Chart 2

**EXAMPLES OF THE DISTRIBUTION OF RISK UNDER
ALTERNATIVE WAYS OF MOBILIZING FUNDS
(Entity Bearing Risk)**

Source of Funds	Type of Risk			
	Credit Risk	Intermediation Risk	Interest Rate Risk	Prepayment Risk
Deposits	Originator or Insurer	Originator	Borrower or Originator	Originator
Bonds	{ Originator or Insurer }	None	Investor	Issuer
Fixed Rate		None	Borrower	Issuer
Variable				

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depository institution bears the risk, or in some countries there is an insurance company that will bear some or all of the risk for a fee. The insurance company may be more efficient at bearing risk than an individual bank because the insurance company diversifies its risk over a very large number of banks and, therefore, has to maintain smaller reserves than individual banks against the possibility of defaults. Under bond financing, the originator probably also continues to bear the ultimate risk of default, i.e., the cost of foreclosing on a loan, selling the unit to another buyer, and other steps.

The second kind of risk is intermediation risk. This is the risk a depository institution faces of people withdrawing their funds from the institution when it is not convenient for the bank to have them do so, if the bank has its money in long-term assets, i.e., long-term loans, and suddenly the money starts to leave the bank, it will experience a severe liquidity crisis. You can imagine such a case when suddenly the stock market becomes very attractive, and a large number of savers who have been keeping their money in the bank move their money to the stock market. Such withdrawals could also be spurred by the government changing the tax preferences to favor stocks, and people shift their money from passbook savings to the stock market. Ultimately, usually there is a governmental agency that will save the bank, but only at a price; it will likely only lend money to the bank at fairly high interest rates because it wants to discourage the bank from being a bad manager of its liquidity position. Hence, it is very clear that the depository institution bears the intermediation risk. On the other hand, if the institution raises funds by selling bonds, he really sells his intermediation risk for the life of the bond, assuming that the bond cannot come back to him unexpectedly. The investor that buys the bond may himself have some intermediation risk, but the mortgage loan originator has essentially given away this risk.

The third kind of risk is interest rate risk, and this may be the biggest risk in transition economies. Czechoslovakia has done marvelously at controlling its rate of inflation, but if you look at the other countries in the region, it is not such a favorable story. Mortgage interest rates today in Hungary are 39 percent; they are 54 percent in Bulgaria. These are not true market interest rates, but it tells you that inflation is high. Interest rate risk is the classic risk of having long-term investments financed with short-term deposits or other short-term sources of money. Mr. Salzman stated this morning that the central bank has prohibited loans with terms over ten years; this is a move on the part of the central bank to control interest rate risk. There are many other ways to handle interest rate risk, but a depository institution bears most of the interest rate risk in originating mortgage loans. The borrower can bear interest rate risk even with a fixed rate mortgage, and this happens if interest rates fall but he is prohibited from prepaying his mortgage. If he could prepay his mortgage and interest rates fall, he would pay off his mortgage and take a new mortgage at the new interest rate. The bank is bearing the big interest rate risk if interest rates go up, because it has to pay more for its deposits, but it cannot change the interest rate on a fixed term mortgage. Under the fixed interest rate bond, it is the investor who bears the interest rate risk. Under the variable rate bond it is the borrower, because whatever happens to the interest rate, his mortgage interest rate changes. So the investor shifts the interest rate risk to the borrower. Presumably to bear this risk, of course, the borrower would demand a lower interest rate compared to a fixed rate mortgage.

The final kind of risk is prepayment risk. This is the risk that the lender bears that the mortgage borrower will pay off his loan before the end of the loan term. Of course, borrowers do not randomly pay off these loans; they more often pay off their loans when interest rates go down. Suddenly, the bank has more money to invest just at a time when

interest rates are low; and it, in effect, suffers a loss in comparison to what his income would have been if he could have kept those mortgages in force. Under the bond model, it is the issuer of the bond, usually the originator, who bears this risk. The mortgage is paid off, he has to continue paying the bond unless he has the option to pay off the bond early.

The main point of the section is about the allocation of risk. What we observe is that there are ways to allocate risk to those who are better equipped to deal with it. The credit risk, some or all of it, can go to an insurance company like America's Federal Housing Administration. Some of the intermediation risk and interest rate risk can be given to institutional investors. Those better equipped to bear end kind of risk will charge a lower price and, therefore, interest rates will be lower ultimately to the borrower.

Picking the Right Mortgage Instrument

While the efficient allocation of risk is important in driving down interest rates, the choice of mortgage instruments may be much, much more important in an economy that is characterized by significant inflation or the potential for very significant variations in inflation over the next several years. Chart 3 give data for Bulgaria that I assembled last September to demonstrate the change in the size of the loan the average family could afford using 30 percent of its income for payments on a 20-year term loan. The first two columns of figures make the point very clearly. For a 3 percent interest rate, the average family of four in Bulgaria could borrow 50,000 leva. At a 20 percent interest rate, it can only borrow 16,000, that is about one-third of what it could borrow at 3 percent, and at 50 percent it can only borrow about one-eighth of what it could have borrowed at a 3 percent rate. The situation in Czechoslovakia today is closer to the 20 percent figure than it is to the 3 percent figure.

Chart 3-

AFFORDABILITY OF A FIXED RATE MORTGAGE UNDER ALTERNATIVE INTEREST RATES

Monthly Income: 935 LV
Payment to Income 30%
Affordable Monthly Payment 280.5 LV
Term: 20 Years

Affordable Mortgage

Interest Rate (Percent)	Affordable Mortgage	Affordable Home Cost	Square Meters of Housing
3	50,577	72,253	36.1
20	16,511	23,588	11.8
50	6,731	9,652	4.8

*Assumes a 30 percent downpayment

**Assumes a cost of 2,000 LV per square meter

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A family of mortgage instruments has been developed to deal with this kind of a problem. They are instruments that index the mortgage principal and begin the prepayment period at a low interest rate and a low monthly payment. The two most common instruments are called the Price Level Adjusted Mortgage (PLAM) and the Dual Index Mortgage (DIM). Let me briefly describe how the price level adjusted mortgage works. The starting interest rate is 3 or 4 percent; it is the real interest rate plus some add-on for credit risk. At the end of the first period, the loan principal is indexed, say by the consumer price index; that is, the principal is increased by the amount of inflation. The new payment then is 3 percent applied to the larger loan principle, and the amortization period, that is the length of the loan term, is reduced by one period; we have new payment calculation: same interest rate, bigger loan balance, shorter loan period.¹

These instruments have been used in a number of countries. They are being adopted in Bulgaria now, and it appears that they are quite safe in terms of the risk that the borrowing household will have to spend an insupportable share of his income to make the mortgage payments. This conclusion is based not just on the experience of other countries that have used these instruments, but there have also been some very detailed simulations for Bulgaria that lead us to think this. Poland has adopted the dual index mortgage, a kind of dual index mortgage, which Jan Brezsky may talk about later. The DIM operates the same way as the instrument we have just described, except there is a second index for payments. The payment is indexed to the country's wage rate, so that the borrower is protected from having to pay more than say 25 percent of his income on mortgage payments

¹ For a complete description, see J.P. Telgarsky and K. Mark; "Alternative Mortgage Instruments in High-Inflations Economies," *Housing Finance International*, September 1991, pp. 27-46.

(if his wage moves with the average wage). If there is a difference between what the borrower should pay and what he can pay, the loan balance is adjusted.

The gains in affordability, that is in the size of mortgage a household can afford, with these instruments is very large as the numbers in Chart 3 suggest. In Bulgaria, it goes up by 8 times for a typical household. Tom Kingsley and Miriam Maxian have done simulations of how affordability would change in Czechoslovakia with this kind of instrument.

But let us return for a minute to lending risks, and say just a word about how the allocation of risk changes when you try these new instruments. It's a new game. Chart 4 shows the allocation of risk under PLAMs and DIMs compared to the standard fixed rate mortgage; it also gives information for an adjustable rate mortgage, which means that the interest rate changes with the market interest rate, perhaps every 6 months. The interest rate risk under the adjustable rate mortgage goes to the borrower, completely to the borrower; and importantly, this is both the nominal interest rate risk and the real interest rate risk. However, under the price level adjusted mortgage, if you're using the index of the consumer price index to index the balance, you shift all of the nominal or inflation related interest rate risk to the borrower. But if real interest rates do not move with the consumer price index, the real interest rate risk remains with the originator. And one would think in transition economies this could be significant. The same is true for the dual index mortgage.

What about the risk of default? Compared to the fixed rate mortgage, the probability of default is quite high under the variable rate mortgage. This is because the full impact of the changes in interest rates is passed through immediately to the borrower in the form of higher payments. Some countries, including the United States, have limits on the extent of the interest rate change that can be passed through by the lender. Such interest rate caps protect the borrower; but, of course, this means that the lender now is bearing more interest

Chart 4

**ALTERNATIVE MORTGAGE INVESTMENTS COMPARED
TO FIXED-RATE MORTGAGE**

instrument	impact on affordability	interest rate risk	risk of default	liquidity risk
adjustable rate mortgage (ARM)	modest increase	shifted to the borrower*	relatively great	slightly more
price-level adjusted mortgage (PLAM)	substantial increase	largely shifted to borrower**	moderately greater	moderately greater
dual index mortgage (DIM)	substantial increase	largely shifted to borrower**	slightly greater	substantially greater

***If adjustment limits are present, e.g. maximum interest rate increase of 5 percentage points over the life of the mortgage, then risk is shared with originator/investor.**

****Adjustment limits in terms of the ratio of mortgage payment to income could be in effect.**

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rate risk. All of this risk goes somewhere. Under the Price Level Adjusted Mortgage, the risk is lower than the for adjustable rate mortgage but greater than the fixed rate mortgage. It is lower than the adjustable rate because the principal is being indexed, the lender is not simply changing the mortgage payment by the interest rate change. For example, a 50 percent change in interest rates, say from 6 to 9 percent, will increase the payment under an adjustable rate mortgage by 50 percent, but only by about 15 percent in the first year under the Price Level Adjusted Mortgage, because the principal is increase by 9 percent (the inflation rate). But these higher payments continue under the FIAM even if the interest rate falls the next year, because the principal has been adjusted. Under the Dual Index Mortgage, the risk of default is only slightly greater than under the fixed rate mortgage. It is slightly greater despite the index, in part because under the fixed rate mortgage the share of income that the household must typically spend goes down very rapidly because his income is rising each year and the mortgage payment is fixed. But under the Dual Index Mortgage, payments are kept at, say, 25 percent of income every year.

The final risk is the liquidity risk; the liquidity risk is really a special kind of intermediation risk, and it arises from some of these loan balances becoming bigger over time, i.e., negative amortization. And as they become bigger over time, if the institution is not successful in mobilizing more deposits, it could have a liquidity problem. The adjustable rate mortgage could have more liquidity risk than the fixed rate mortgage if there are limits on the amount of interest change that is passed through to the borrower, and if that extra interest payment is added to the loan principal. So there is negative amortization during this period. There is similar negative amortization, increases in the loan balances, under the Price Level Adjusted Loan; and potentially very large negative amortization under the Dual

Index Mortgage if wages go up more slowly than prices. As long as wages are behind prices, the loan principal is expanding.

Conclusion

So what does all this mean? Stated briefly, there are clearly many alternatives for structuring a mortgage financing system, and clearly Czechoslovakia should choose that combination of arrangements for funds mobilization, loan origination, and investment that is best suited to its current economic situation and the situation likely over the next five years. As you think about options, and as you can see there are many options, I would suggest that you judge each option by three criteria. First, is the system financially sound? That is, are the risks involved in mobilizing the funds and in making the loans acceptable? In what danger are you placing depositors or originating institutions through the system? Can the system work without subsidies? If the country decides it is going to introduce a subsidy of some form into the housing finance system, has it done it in a way that the system cannot operate without these subsidies? If the answer to that question is "yes," you have made a fundamental mistake in designing the system.

The second criterion, is the impact of the system on housing affordability. In very specific terms, you should ask the question: "How large a loan could the average Czech or Slovak household take using 25 percent of its income?" If it turns out that this number is foolishly small, you've probably made a mistake. Your construction industry obviously will not be revived with such a housing finance system, and housing construction is a key element in trying to drive the macro-economy of this country. It would soak up a lot of labor. The fact that there is almost no construction now is a genuine problem, and the second criterion poses a very important question.

The third criterion asks whether the system is efficient. Is there competition? Will there be a number of different banks originating loans and will they compete for this business? Additionally, are the risks inherent in mortgage lending being allocated to those who are best able to bear them? Have you allocated these responsibilities in a way that those better able to bear them have them, and that means that the interest rates will be lower to the borrower, the ultimate objective. If your system meets those criteria, you are well on the road to an expanding housing sector that will serve the needs of your citizens.