

# Early Repayment of fixed-rate Mortgages – there is no free Lunch

Providing consumers with the right of early repayment of fixed-rate mortgages at little or no additional charge has been a long-standing demand of consumer groups in mortgage finance. But, given that investors in pools of fixed-rate mortgages face reinvestment risk for the funds they receive (do not receive) from prepayments, there can be no free lunch.

Either the additional risk is reflected through an interest rate markup, which renders mortgage loans considerably more expensive – the situation in the US fixed-rate market. Or, to avoid higher rates, the lender adopts call protection strategies, e.g. by charging an indemnity – the situation in the European markets.

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Public intervention into call protection may fend off extreme situations for the consumer, but entails the danger of reallocating the profits and losses of prepayments in an arbitrary way between consumers and investors and reducing the overall efficiency of the market by limiting product choice.

Politicians have also discovered refinancing by large borrower groups to be a convenient way to pump-prime a sagging economy. Stimulating debt service relief may produce short-term effects on consumption and the housing market, but again carries a high risk of market distortions, in particular a reduced supply of fixed-rate mortgages and the loss of their protective features for consumers. However, enabling non-redistributing prepayments is important for more flexibility in housing and labor markets.

The ideal seems to be a complete market in which consumers are able themselves to choose between call protected and unprotected fixed-rate mortgages which are clearly legally and financially structured. The market closest to this ideal at the moment is the Danish market.

### Right of Early Repayment = Prepayment Option

Lawyers and economists use two different languages to describe the same facts. When a lawyer speaks of a contractually or legally defined right, an economist thinks of a mathematically structured option. Such options can always be assigned a generic value by applying standard valuation formulae. Some of them, as is well known to anyone investing in the stock or bond markets, are even traded and have thus been given a market price. Early repayment presents a perfect example. It is one of many options which together form a mortgage contract that assigns rights to consumers and lenders.<sup>1</sup>

Options embedded in mortgage contracts differ vastly in their economic significance and characteristics, depending on the type of product. In a fixed-rate mortgage contract, borrower default risk caused by rising interest rates is limited. On the other hand, there is prepayment risk as consumers may refinance when rates have dropped beyond a certain threshold defined by transaction costs. In contrast, in an adjustable-rate contract, default risk through rising inflation may be very significant while prepayment risk is very low as there is little financial incentive to switch loans. What remains are so-called “non-financial” prepayments related to labor or housing market factors, e.g. a move caused by professional change or a house sale in favorable conditions.

### The Costs of the Prepayment Option

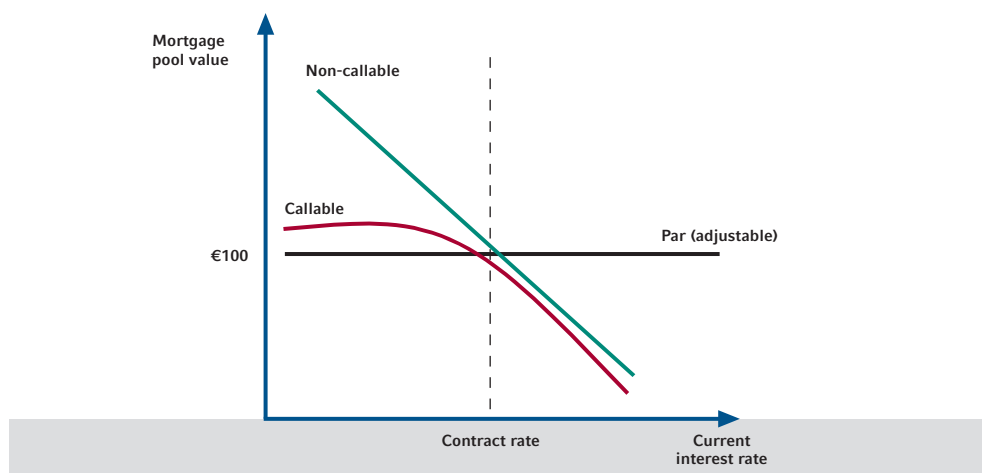
Fixed-rate mortgages may produce quite different cost profiles, depending on whether they are “callable” through financially motivated prepayments, or “non-callable.” Chart 1 displays the value of two different pools of fixed-rate mortgages in response to interest rate changes. Loans in both pools carry the same contract rates. The non-callable mortgage loan pool rises (falls) in value if interest rates drop (increase), behaving just as the most common government or corporate bonds. The callable mortgage loan pool behaves differently –

<sup>1</sup> Other consumer options include the right to receive the promised funds once a contract is concluded, or the right to rescind a concluded contract within a short cooling-off period. Even a default can be considered a consumer option, in which he trades a loan claim for the mortgaged property. There are also lender options, for example the right to foreclose on the property after a default.

it hardly rises in value if interest rates drop, due to the fact that prepayments are made which have to be reinvested at the current market rate. The callable fixed-rate loan pool is thus of a hybrid nature: it resembles a pool of adjustable-rate loans if interest rates fall, and a pool of non-callable fixed-rate loans if interest rates rise. Aggregating over all interest rate scenarios, its value must be lower than that of a non-callable mortgage loan. In order for both to fetch the same price on the capital market, investors will require a higher coupon for the callable loan than for the non-callable loan.

Chart 1:

**The value of callable and non-callable fixed-rate mortgage pools in response to changes in current interest rates relative to contract rates**



Source: Dübel

**Note:** If we assume today's interest rates are equal to the contract rate, say 7%, then the value of both callable and non-callable fixed-rate mortgage pools is approximately par (€100). If interest rates rise, both pools will fall jointly in value. The reason is that in the callable pool, only very few calls will be made, and none of them for financial reasons. In contrast, if interest rates fall, the non-callable mortgage pool will rise more strongly in value than the callable mortgage pool. The reason is that financially motivated prepayments start to convert parts of the callable mortgage pool into cash which needs to be reinvested at par.

How large will this markup caused by the prepayment option be? To start with, as with any other option, the value of the prepayment option value depends on a combination of “time” and “inner” value, adjusted by the transaction costs of exercise. The “time value” will depend on the duration of the fixed-rate period and the volatility of interest rates. A 30-year fixed-rate mortgage loan as practiced in the USA causes higher prepayment option costs than a 15-year fixed-rate mortgage loan typical of France. Similarly, a mortgage loan in a high volatility environment will carry higher option costs, as the likelihood of a strong rate decline will be higher. The “inner value” of the option depends on the level of the underwriting coupon rate relative to market rates – often influenced by tax factors; some option models assume interest rates to be “mean-reverting,” which would imply mortgages of low (high) coupon rates carrying lower (higher) prepayment option costs.

The more problematic issue when pricing the option, however, is assessing consumer behavior. How fast and precisely when borrowers in a given pool will react to declining interest rates by prepaying their loans depends on their financial astuteness, information set and strategy. In the USA and Denmark, the two economies with callable long-term fixed-rate mortgages, refinancings have become so popular and widely publicized as to trigger massive customer reaction to declining interest rates. However, even here some

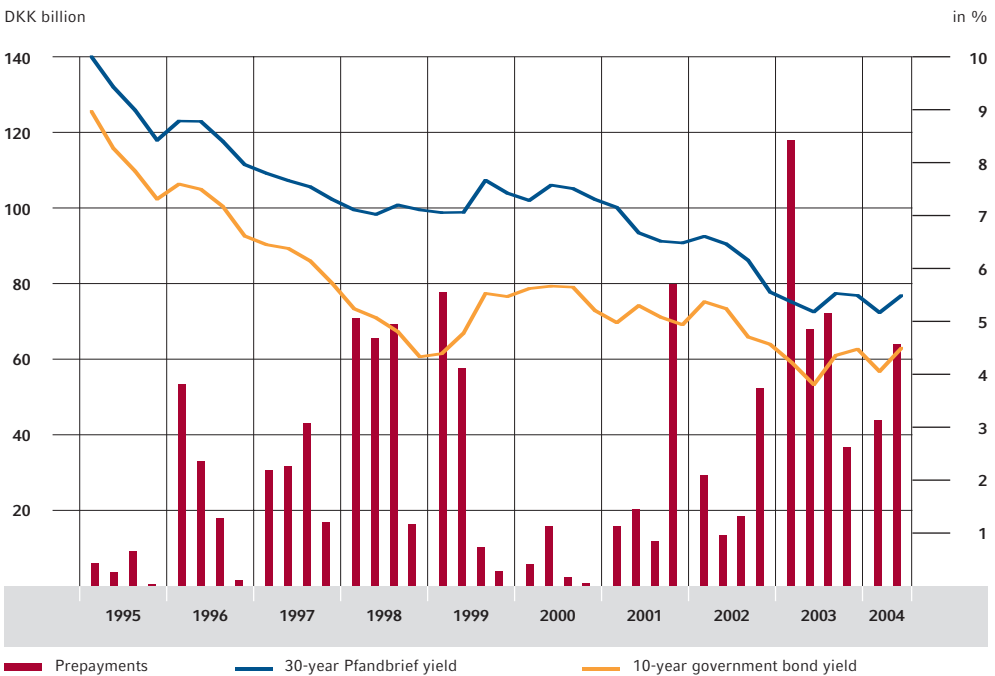
consumers do not understand their own interests very well and do not prepay. And most either prepay too early, as rates continue to decline, or too late, when rates have started to rise again.<sup>2</sup> This consumer heterogeneity causes different portfolios to display vastly varying levels of “convexity,” i.e. the degree of closeness of pricing behavior of a pool of fixed-rate mortgages to a pool of adjustable rate mortgages (in chart 1 represented by the gap between the red and the horizontal black line). Finally, prepayment behavior may interact in complex ways with default.

Investors and traders on Wall Street and the Copenhagen market place employ large numbers of experts, often mathematicians and physicists, on modeling prepayments who still usually disagree about proper methodology and pricing results. The most commonly used methodology are econometric estimates derived from market prices for bonds which pass through prepayments to investors – mortgage backed securities in the USA and callable mortgage bonds in Denmark.<sup>3</sup>

In the mid-1990s, pricing the very liquid MBS guaranteed by Ginnie Mae – a full faith and credit US federal government agency – off US treasury bonds of comparable duration yielded a typical range of prepayment option costs of between 70 and 100 bp.<sup>4</sup> However, during the past years, which were characterized by revolving situations of extremely high

Chart 2:

**Danish mortgage prepayments and bond market rates (1995 – 2004)**



<sup>2</sup> Kalotay, Yang and Fabozzi (2004)

<sup>3</sup> Kalotay, Yang and Fabozzi (2004), expressing frustration over the lack of accuracy of the current econometric standard, develop an empirical approach for the calibration of an option-theoretic model of prepayment.

<sup>4</sup> Dübel and Lea (2000)

<sup>5</sup> For example: Wall Street Journal of August 8, 2002: Bond Market Confronts Turmoil from Homeowners' Refinancings.

<sup>6</sup> Graven Larsen (1993) is one of the few references in the literature where explicit reference is made to the price of the option.

prepayments – such as during late 2001 and late 2002 – spreads have been reported to have widened beyond that level.<sup>5</sup> Similar observations can be made for Denmark, where option costs in the early 1990s were considered to be in the range of 30 – 45 bp, but are since considered to have increased.<sup>6</sup> Chart 2 gives some idea about spread dimensions of Danish callable mortgage bonds over their government benchmarks, which are well above respective non-callable Pfandbrief data, mainly due to the costs of the prepayment option.<sup>7</sup>

## The Art of Call Protection

Ever since the high-inflation phase of the 1970s, European lenders have sought to reduce prepayment incentives for fixed-rate mortgage borrowers through call protection means. These take the form of prepayment fees and indemnities, or the contractual exclusion of prepayment. Legal and process costs of a refinancing transaction play an additional role to the extent that lenders are able to influence them. The strategy is mainly motivated by the form of refinancing of fixed-rate mortgages that is typical for European markets, usually non-callable corporate bonds that are tightly priced over government bonds. Mortgage markets using this funding tool have achieved remarkably low mortgage credit costs.

This holds particularly true for the highly standardized German market with its liquid Pfandbrief funding system. Table 1 presents computations from the Mercer Oliver Wyman study, co-authored by the writer, that yield both negligible prepayment option costs and very low overall mortgage prices for Germany. The reason is the almost exclusive practice of so-called “reset” fixed-rate mortgages (Abschnittsfinanzierung), which are directly

**Table 1:**  
**Adjusted mortgage price by markets (April/May 2003)**

	Unadjusted price		Forward and option costs			Adjusted price
	Rate	Fee	Yield curve	Credit risk	Prepayment risk	
Denmark	5.10%	0.09%	3.83%	0.06%	0.46%	0.84%
France	4.93%	0.17%	3.79%	0.13%	0.29%	0.89%
Germany	4.77%	0.07%	3.99%	0.09%	0.06%	0.70%
Italy	4.68%	0.04%	3.00%	0.19%	0.20%	1.34%
Netherlands	4.39%	0.16%	3.30%	0.08%	0.20%	0.97%
Portugal	3.53%	0.06%	2.46%	0.17%	–	0.95%
Spain	3.44%	0.11%	2.40%	0.12%	–	1.03%
UK	4.80%	0.07%	3.60%	0.12%	0.01	1.15%

Source: Mercer Oliver Wyman

**Note:** Analysis based on 45 questionnaires completed by European lenders and market data. Adjusted price analysis based on a composite of prices for all lenders included within each country. Published rates were used. May overstate price in countries where negotiated discounts are common. Note that these numbers are averages across all products and so do not represent the characteristics of any single product. However, we believe that the adjusted price is comparable across markets as it adjusts for differences in product mix, interest rate risk, credit risk and prepayment risk and so represents a comparable price to the borrower. Note that adjusted price analysis does not adjust for product cross-subsidies or government subsidies and so comparisons across countries are distorted by these factors.

<sup>7</sup> Danish mortgage bond spreads in the period covered by chart 2 varied between 100 and 255 bp, at the peak of the Asian crisis in 1998/99. During the same period, 10-year Jumbo Pfandbrief-Bund spreads varied between single or low double-digit levels and a maximum of 70 bp in 2000.

**Table 2:**  
**Call protection regimes for fixed-rate mortgages in Europe**

Contractual indemnity level	Greater than yield maintenance*	Equal to yield maintenance	Lower than yield maintenance	No contractual indemnity
Prepayment option costs	zero	zero	partial options costs	full option costs
Denmark**		X		X
France			X	
Germany		X		
Italy		(X)	X	
Netherlands		(X)	X	
Portugal			X	
Spain			X	
UK	(X)	(X)	X	

Source: Dübel

X: current practice

(X): abolished or diminishing practice

\* Yield maintenance: the indemnity is equal to the difference between contract rate and current market rate (residual loan duration) times the outstanding volume. Various formulations exist.

\*\* Denmark features both callable and non-callable mortgages (with implicit yield maintenance).

Table considers financial motives of prepayment only.

**Note:** If an indemnity greater than or equal to yield maintenance level is charged, the reinvestment loss due to prepayment is zero (or even negative) and hence option costs will be zero. If an indemnity below the yield maintenance level is charged or indemnities are zero, the lender will typically incur a reinvestment loss. In this case, option costs will be charged by the lender in the form of an interest rate markup.

priced off the Pfandbrief and either repriced, or prepaid, at the given reset date, but not before. To defend this product during high inflation, German legislators took the unusual step of permitting lenders the contractual exclusion of prepayments. By 2002, this practice had been partly replaced by the charging of yield maintenance prepayment indemnities, which eliminate reinvestment losses for lenders.<sup>8</sup>

Paradoxically, even as Pfandbrief-like funding structures have risen strongly in popularity in Europe during the last decade, the general policy trend has been an increased intervention into such call protection arrangements. Table 2 summarizes the current regimes for eight countries: in the majority, after charging legally permissible levels of indemnities or fees the lender remains burdened with potential reinvestment losses.

Interventions take place either by law (Belgium, France), court practice (Netherlands) or indirect public pressure on business practices (Spain, Portugal, Italy). As a result, prepayment risk in many European markets needs to be priced as an interest rate markup, rendering loans significantly more expensive. Table 2 summarizes option cost values assessed by the Mercer Oliver Wyman study. In Spain and Portugal, where fixed-rate markets have almost disappeared, the figures reflect the predominance of adjustable-rate mortgages.<sup>9</sup>

<sup>8</sup> Before the 1970s, German fixed-rate mortgages were universally prepayable. Following a recent reformulation of the Civil Code the contractual exclusion of prepayments is no longer possible in certain cases, such as move or sale, when a yield maintenance prepayment penalty is charged from prepaying consumers which compensates the lender for reinvestment risk.

<sup>9</sup> Great Britain, with its predominantly adjustable-rate system and specific competition dynamics, represents a special case. Prepayments are large due to switching to competitors that offer low and fixed teaser rates (usually for 1 or 2 years). "Hopping" from teaser to teaser is prevented by large prepayment penalties; however, consumer group pressure has led to a significant reduction of their admissible levels, which has caused prepayments to increase.

Most interventions into call protection are creations of the high inflation phase of the 1970s and the subsequent disinflation phase that lasted until the mid-1990s. This period was characterized by extreme mortgage rate levels and volatility. Policies were driven by valid concerns about the portfolio quality and affordability implications of persistent high interest rates paid by large numbers of borrowers. Unfortunately, a frequent feature of interventions is that their impact extends far beyond the events they were initially intended to address and causes high costs for future consumer generations by limiting product choice.

The French experience presents a bizarre point in case: in 1979, at peak inflation rates, the National Assembly passed legislation limiting prepayment indemnities to token levels (Loi Scrivener). Shortly afterwards, a successful disinflation policy generated a precipitous rate decline, which in turn triggered high prepayments. By the mid-1980s, many lenders were confronted with huge losses because they had issued non-callable debt to fund callable loans. The *Marché Hypothécaire* – a Pfandbrief-like issuance mechanism for non-callable debt – broke down. A two-decade long political struggle followed that has not yet reached its conclusion. It culminated in 2000, when all major French lenders were fined by their national competition watchdog for having colluded against accepting switching borrowers in the early 1990s, to forestall another prepayment wave. French lenders also consistently lacked enthusiasm to promote a badly needed legal reform of the mortgage instrument, which could have led to a reduction of the high transaction costs of prepayment. Given the long-term impact on market practices, *Loi Scrivener* has remained a matter of controversy to the present day.

A similar process seems to be unwinding in the USA as inflation subsides. The rise of Fannie Mae and Freddie Mac in the early 1980s as government-guaranteed duopoly purchasers of mortgages in the secondary market meant that call protected mortgages were no longer accepted in the largest US mortgage market segment. Opposition to this practice initially came primarily from servicers whose revenues were highly vulnerable to prepayments. In the 1990s, the pricing difficulties described and increases in volatility of prepayments became major factors in the strong and widely criticized expansion of portfolio lending by Fannie Mae and Freddie Mac. They de facto turned into European portfolio mortgage banks under government sponsorship, abandoning their politically intended focus on the guarantee business. The pressure on both institutions to avoid further accumulation of prepayment risk has mounted in the past years to the extent that their mortgage purchasing policies with regard to call protection have come under review.

Beyond inflation risk aspects, call protection strategies remain controversial due to lack of standardization of the computation method for indemnities and the consequences in individual hardship cases.

## Settling the Consumer Protection Debate

The discussed cases indicate that costs and benefits of public interventions into call protection features are seldom sufficiently evaluated and their long-term consequences for the market may be severe. On the other hand, choosing the wrong product undeniably exposes consumers substantial financial risk. In extreme case their inability to service debt fixed at too high rates may trigger the loss of (equity in) the house. What then should the guiding principles for intervention be, and is there an optimum set of contracts that would sufficiently serve both consumer and lender interests?

Public interventions into market mechanisms should be guided by a clear analysis of market failure, followed by cost-benefit analysis of the proposed means. Consider the example of consumer heterogeneity. Some consumers will always fail to completely understand their best financial interest in selecting mortgage products. However, this is the case for all currently practiced products: in the “German” case, some borrowers can be shown to lock in high interest rates for long periods – misunderstanding their inability to prepay; in the “American” case, some borrowers able to prepay simply do not exercise their right to do so and pay a significant option premium for no reason; finally, in the “British” case, borrowers unable to sustain high interest payments nevertheless take on substantial interest rate risk by choosing adjustable-rate mortgages.

Despite their individual risk content for consumers, there is little point in banning any of the three discussed products or imposing additional costs on them, as borrowers may switch to alternative products that entail different risks. Table 3 provides some indication of the striking changes in product market shares in six markets with prepayment option costs imposed on long-term fixed-rate mortgages. In both the USA and Denmark, longer-term fixed-rate mortgages (non-callable) have gained dramatically in relevance; in Denmark, moreover, where public support of the secondary market is weaker than in the USA, the long-term fixed rate mortgage (callable) has retreated. In Spain, durations of fixed-rate contracts have shortened considerably; most are now tracking short-term indices. In France, short-term fixed rates also seem to have gained in importance.

**Table 3:**  
**Product market shares and call protection of fixed-rate mortgages**

Country		Denmark		France		Germany		Spain		UK		USA*	
Year		2003	ca. 1995	2003	ca. 1995	2003	ca. 1995	2003	ca. 1995	2003	ca. 1995	Q II 2004	ca. 1995
Product	Rate fixing												
Variable	up to 1 year	19		5	20		40			65	70	13-15	27-39
Reset, short	> 1 to 5 years	16	10	35		20		93	80	28		20-25	
Reset, long**	> 5 to 15 years	10		60	80	80	60	7	20	7	30		
Fixed to term	> 15 to 30 years	55	90									65	73-61
Call protection***		none		weak		strong		weak		relatively strong		none	

Sources: MBAA, Federal Reserve (USA), Nykredit (Denmark), Mercer Oliver Wyman (2003), Dübel/Lea/Welter (1997), author's assessments

\* US data for ca. 1995 reflect the period of 1994-1996, may include some reset FRMs (not differentiated in ARM definition). Author's assessment based on Federal Reserve quarterly survey of bank lending officers.

\*\* main fixed-rate product

\*\*\* France/Germany includes some short-term loans (under 20 years) fixed to maturity.

What can be dealt with are actual market failures. For example, lenders may be inclined to exploit the information advantages they have over consumers by inducing them to buy expensive products. High net worth clients may be treated differently from mass retail borrowers. In these cases, policy makers can improve consumer education and counseling and possibly address bank internal conflicts of interests. They can furthermore standardize products to a degree, e.g. by defining the details of prepayment indemnity computations.



Non-financial prepayments can be made easier by reducing transaction costs or overly rigid legal practices (e.g. in case of a “justified” consumer interest). Within a framework of universal prepayment allowing call protection, hardship cases can be dealt with by sufficiently elaborate debt restructuring procedures that will generally involve some degree of interest forbearance.

Denmark currently seems to be practicing the closest to a complete set of products that should give little reason for policy intervention on behalf of consumers. The mortgage credit institutions issue both callable and non-callable fixed-rate loans. The corresponding mortgage bonds carry prepayment option costs in the former, but not in the latter case. Non-callable mortgages in Denmark differ from their German or Dutch counterparts in that borrowers are able to prepay at any time through the so-called “delivery option.” The consumer prepays by paying the going market price for the mortgage bond, which implies yield maintenance for the investor. However, this also means that potential financial losses and gains for borrowers or investors from issuing or holding a non-callable fixed-rate instrument are symmetric (see chart 1). In particular, if interest rates rise, for example in an economic upswing, the borrower pays a lower repurchasing price for his bond and can therefore afford a higher interest rate payment after a move.

### The Macroeconomic Temptation

The refinancing decisions of mortgage borrowers greatly influence private consumption, the largest component of economic activity. Prepayments of loans without call protection features lead to a reduction in housing costs for consumers that generates resources for increased consumption of both housing and other consumer goods. This mechanism is particularly relevant during periods of slowing or declining economic activity, when interest rates tend to fall.

Evidence from countries with high mortgage market penetration show how strong those effects can be. Within the space of ten years, Denmark experienced three large prepayment waves: 1994, 1998/99 and 2002/2003, each associated with significant ensuing acceleration of private consumption. The 1994 wave, induced by changes in mortgage taxation in combination with other fiscal stimuli, produced a 6.5% private consumption growth which placed Denmark at the top of the OECD league.<sup>10</sup> Similar effects were felt in 1998/99 and 2002/2003. Denmark’s largest lender Nykredit estimates that 31% of its borrowers refinanced in 2003. Of these, 71% were able to increase their disposable income after housing costs while the others leveraged up their house or traded up into a better one. Similar trends were recorded in the USA where the latest prepayment wave is widely held to have stabilized both the housing market and private consumption and possibly saved the world’s largest economy from recession.

Prepayments may also help avoid defaults as housing costs will be adjusted to lower affordability levels as unemployment rises or wages decline. They ease labor mobility and help reduce unemployment. Finally, they exercise positive competitive effects within the mortgage industry, which receives higher gross turnover and bridges turnover cyclicality over

<sup>10</sup> Dübél and Lea (2000)

the interest rate cycle: lenders benefit both in times of high interest rates – characterized by higher economic and net lending activity – and low interest rates – characterized by high prepayments. It therefore seems reasonable from both a macroeconomic and a mortgage market development standpoint to establish prepayable fixed-rate loans as part of a complete mortgage product range.

However, these benefits again induce costs that need to be taken into account. A first and serious problem is that losses and gains from financially motivated prepayments represent primarily economic redistributions. Generally, pump-priming efforts will try to shift resources from households with low consumption preferences to those with high ones. Let us divide the former group into the “rich,” the “elderly,” and the “unborn” while calling everyone else with high consumption preferences “families.” The classic mechanism of pump-priming is through increasing government debt, which implies taxing the unborn for the benefit of current families. Similarly, the rich can be taxed more highly to raise the disposable income of current families, who increase spending.

Financially motivated prepayments are a special case: they primarily tax the elderly, who are most likely to hold highly rated bonds, by lowering the investment returns on their holdings. It is no coincidence therefore that large US pension funds are among the most vocal critics of absence of call protection features in mortgage products and increasingly force intermediaries to take, rather than pass through, prepayment risk.

A second problem is the incidence of increased prepayment option costs, which are associated with large swings in economic redistributions, among heterogeneous borrower groups through product changes. Table 3 indicates a trend towards shorter fixing periods in mortgage markets where fixed-rate mortgages are weakly call protected. Acknowledging the problems of interpreting market share changes over time, there is a high likelihood that the pricing problems and likely price increases arising from surprisingly high prepayments in the past decade have mattered. It should be noted that, if an increase in the option costs leads to a higher demand for non-callable fixed rates, interest rate risk exposure are likely to stay manageable. However, there is concern that first-time or financially weak borrowers may move increasingly into cheaper-looking yet riskier adjustable-rate products. The mortgage interest deductibility schemes applied both in Denmark and the USA should cushion the scale of substitution effects away from callable fixed-rate loans somewhat, as they implicitly subsidize the prepayment option; however, the effect is smaller the lower the borrower’s income level is.

Third, while the advent of an elegant pump-priming instrument may generally be welcomed, there is a significant accompanying risk of an increasing volatility of economic activity. Monetary policy makers, for example, will not be keen on turning large parts of the loan and bond markets from fixed into flexible rates as they risk increasing liquidity fluctuations. In Denmark today, an almost parallel movement of existing mortgage portfolio rates and new lending rates can be observed, similar to the UK and quite different from Germany. Greater pass through of interest rate signals could imply a much greater sensitivity of incomes and economic output to money market rates, and consequently an enhanced risk of missteering of the economy and generation of boom-bust cycles. For this reason, the British government is currently discussing steps to reduce the interest sensitivity in the financial markets, inter alia by expanding the share of fixed-rate mortgages.

To summarize, it should be mostly the labor and housing market functions of prepayments that are attractive from a macroeconomic standpoint. Sufficient flexibility can be achieved here within a reasonable call protection framework. From a mortgage industry perspective, prepayments form an interesting opportunity to raise and stabilize turnover, though at the expense of decreasing customer loyalty and declining contract durations.

## Conclusions

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Providing borrowers of fixed-rate mortgages with a prepayment option produces option costs of considerable size and requires complex pricing and funding approaches. Introducing call protection features reduces these costs, eliminating in the ideal case financial redistributions between borrowers and lenders or investors.

Ideally, fixed-rate mortgage borrowers should be able to self-select in a complete market containing both call protected and unprotected fixed-rate mortgages, which are clearly legally and financially structured. The market closest to this ideal at the moment is Denmark, which has both types of loans and corresponding funding instruments.

Political intervention into the non-callable fixed-rate market will reduce the lenders' ability to implement call protection, e.g. through indemnities. This entails the danger of reallocating the costs of prepayment in an arbitrary way and reducing the overall efficiency of the market by limiting product choice. Enhanced consumer education and counseling options as well as limited product standardization should serve to fend off possible extreme situations for consumers.

Redistributing financial gains and losses from prepayments between household groups with different consumption preferences has proven to be a valid macroeconomic pump-priming strategy. However, as with any redistributive pump-priming effort, the effect is mainly of a short-term nature, and the risk of permanent market distortions is high. Enabling prepayments devoid of financial redistributions, however, is important for greater labor and housing market flexibility.

### Author's Bio Note

Hans-Joachim Dübel is an independent international financial services and policy consultant based in Berlin. In this function, he provides economic analysis and advice on the legal, regulatory, fiscal and social aspects of European financial sector development, with a special focus on mortgage finance. His clients include international organizations, governments, trade associations and the private sector.

Mr. Dübel has been on the staff of the Financial Sector Development Department of the World Bank in Washington, DC, and of empirica, an economic think-tank based in Bonn and Berlin.

Since 1993, he is a permanent advisor for the Association of German Mortgage Banks. In 1995 he authored the first econometric model based commercial credit risk analysis outside the USA that contributed to the change in regulatory approach in banking towards risk-based capital requirements. In 1997, he published the first internationally comparative analysis of mortgage prepayment risk with Michael Lea. In 2003, Mr. Dübel co-authored the Mercer, Oliver, Wyman study on Financial Integration in the EU for the European Mortgage Federation with Simon Low and Matthew Sebag-Montefiori.

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