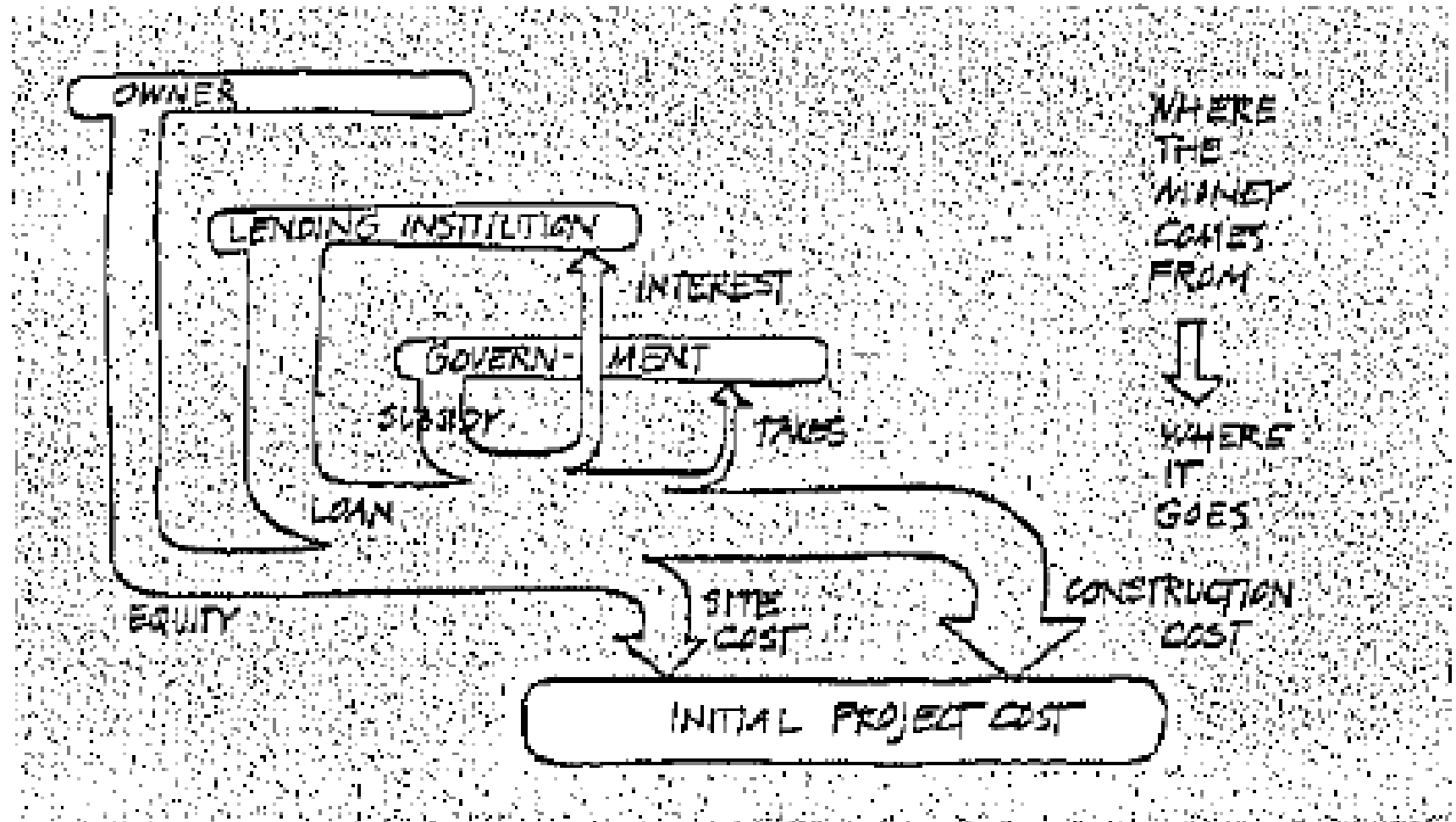


INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- There are three main sources of funds involved in a typical construction project. The costs of site acquisition, planning, and construction of the building are covered:
- (a) by the owner's own funds, the equity investment (down payment);
- (b) by money borrowed from one or several lending institutions;
- (c) where applicable, by subsidies from government agencies, which may come in the form of loans or loan guarantees by the government, in the form of tax advantages, or (more rarely) in the form of outright funds supplied by the government.
- Of course, this outline is not the whole story. It covers only the first step of getting the building built. Specifically, it addresses the first phase of financing a building, which is the phase of financing its construction. The main component at this phase, the construction loan (b), must be repaid in some way. If the project is sold immediately after completion, the sale proceeds would be used to pay off the loan.



INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS



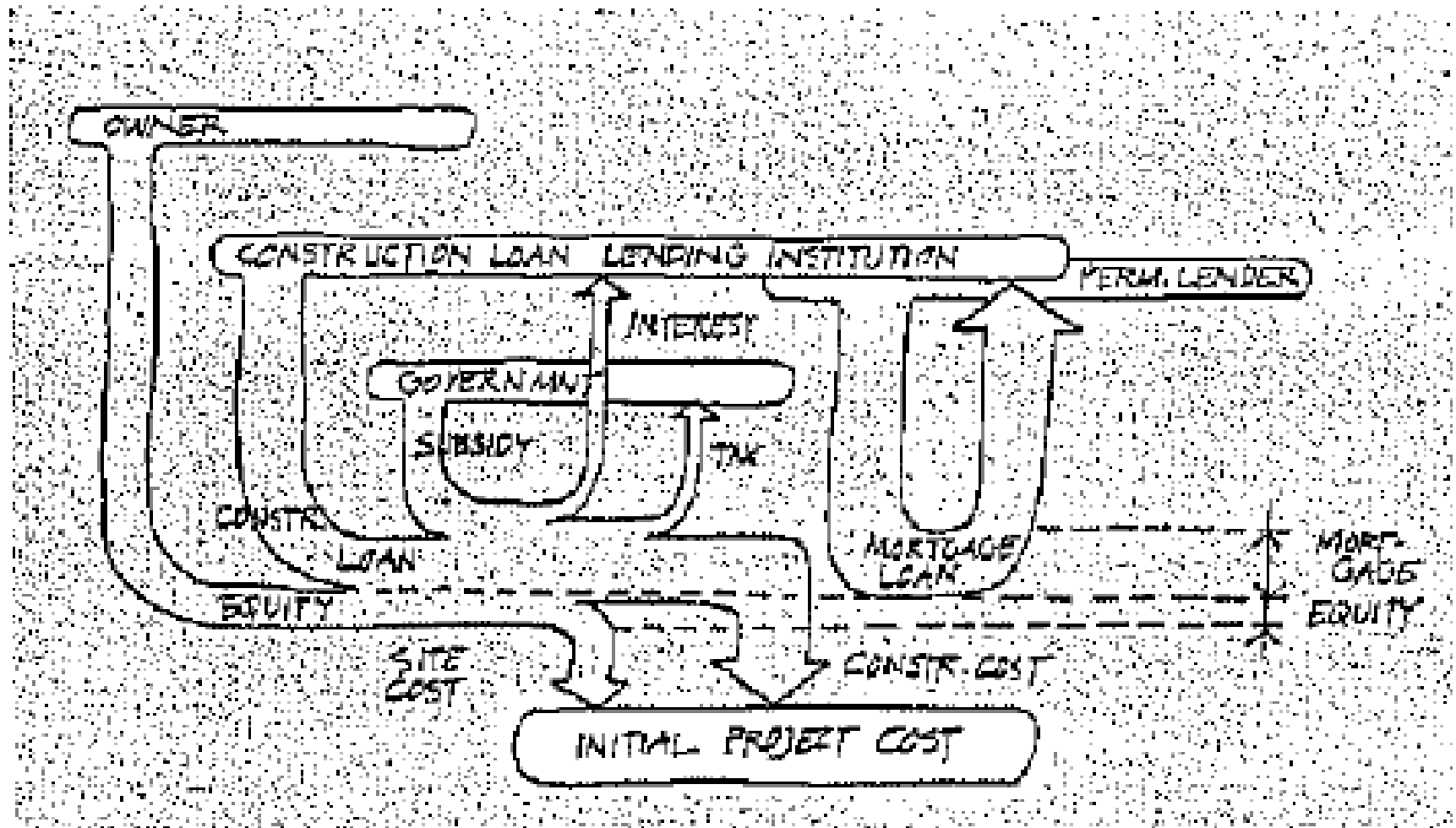
FUNDING CONSTRUCTION PROJECTS PHASE 1 - CONSTRUCTION FINANCING

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- If the owner keeps the building, the construction loan must be converted into a long-term loan—the mortgage. These two steps occasionally may be fused into one, and the lender may be the same in both cases; but it is conceptually more clear to think of two distinct phases and two different lenders: one for the construction loan and one for the long-term or "permanent financing" loan or mortgage. The loan from the long-term mortgage is used to pay off the construction loan.
- For example, the buyer of a new building arranges for a mortgage to finance the purchase price for the project with bank A. The buyer then gives the money to the seller of the project, say a developer, who has borrowed the construction money from bank B, and uses part of it to repay this construction loan.



INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS



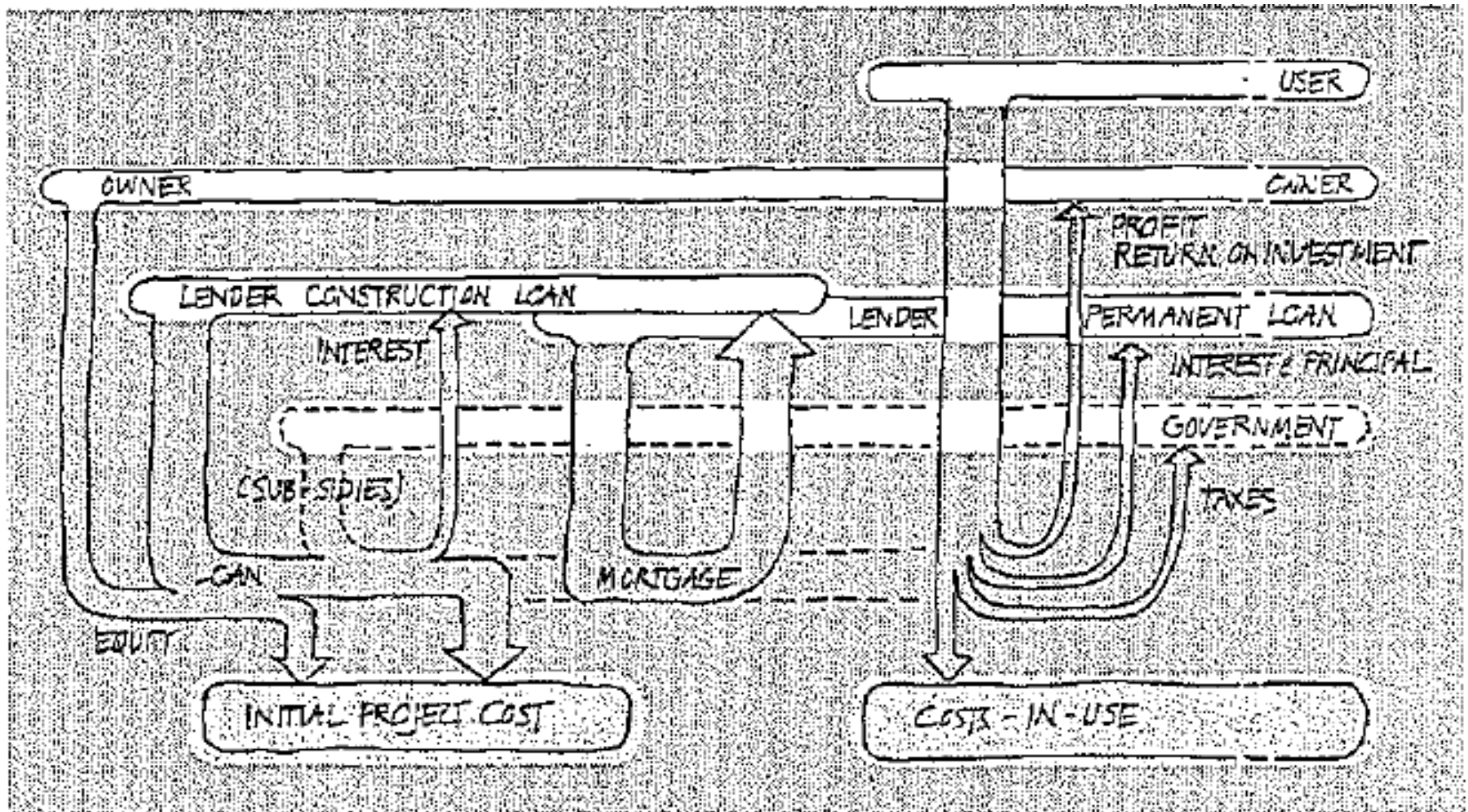
FUNDING CONSTRUCTION PROJECTS - PHASE II . PERMANENT VS. CONSTRUCTION LOAN

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- In addition to the prior two phases, in the process of paying off the long-term mortgage, a new source of funds is introduced—the user, who may be the tenant paying rent for the use of the building or of a part of it. (Again, the user also may be the owner, but it is easier to think of the roles as separate in order to understand the process.) Some of the rent payments will be used to cover the costs of operating and maintaining the building, including taxes. Another part will go toward repayment of the mortgage loan—"debt service."
- Finally, if the owner and the tenant are separate, the owner will expect part of the rent to repay his or her equity investment with interest, or profit.



INAR 413 BUILDING ECONOMICS
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FINANCING CONSTRUCTION PROJECTS



FUNDING CONSTRUCTION PROJECTS - PHASE III - DEBT SERVICE, COSTS-IN-USE

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

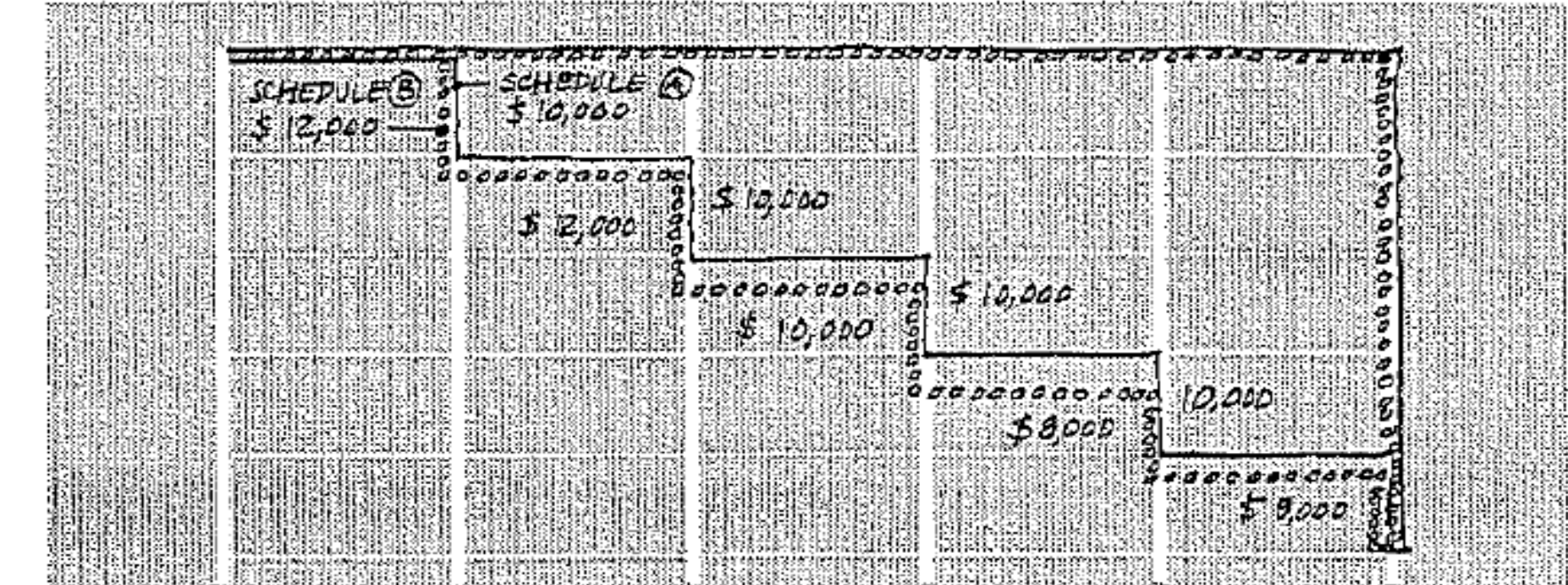
- An owner or developer planning to build a project will arrange for financing its construction with a suitable bank, savings-and-loan, or other lender if the owner's own funds are insufficient to cover all the costs involved.
- It is rare nowadays to have an owner pay outright for an entire project. Typically, the construction loan will be a credit line in the amount of a certain percentage of the estimated project cost, the loan-to-value ratio, which will be determined in part by the amount of available equity on the one hand and by lender policy on the other.
- A frequent assumption is a loan-to-value ratio of 0.8 or 80% financing, which would require the owner to contribute 20% of the project cost as his or her equity in the project.
- In reality, an owner's or developers "sunk costs" (the costs already incurred that cannot be recovered even if the project should not be realized), such as the cost of the previously purchased site and the site development costs, will be counted against this equity requirement so that the lender will supply all or almost all the actual funds needed for construction. For many projects, 100% financing is no longer uncommon.



INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- The lender will charge the borrower both for lending the money and for efforts involved in establishing the transaction. The latter is done in the form of "closing costs"—the various fees for services involved in setting up the loan: checking the applicant's credit, reviewing and processing the application, title checks, legal fees, surveys, documentary stamps, taxes, and so on—and "discount points," which may range from 1% to 4% or more of the amount borrowed. This amount is taken off the top of "the amount actually disbursed; it constitutes one part of the cost of construction financing.
- The other part is the interest on the loan. Interest is charged on the actual amount drawn against the credit line and usually is paid monthly. That is, as bills for materials and completed work on the project begin to come in, they are paid from the credit line.
- Interest then is charged month by month on the amount drawn, until the project is completed and "the entire loan can be repaid. The actual amount of interest that must be paid thus depends both on the total construction time and on the pattern in which the bills for completed work come due. This pattern is called the "draw schedule."





INTEREST

SCHEDULE (A)	100	100	100	100	100	\$1000
		100	100	100	100	

[illegible]

100

SCHEDULE (C):

100

[illegible]

SCHEDULE (B) 120 120 120 120

120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573
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TWO DRAW SCHEDULES AND CORRESPONDING INTEREST PAYMENTS ON CONSTRUCTION LOAN

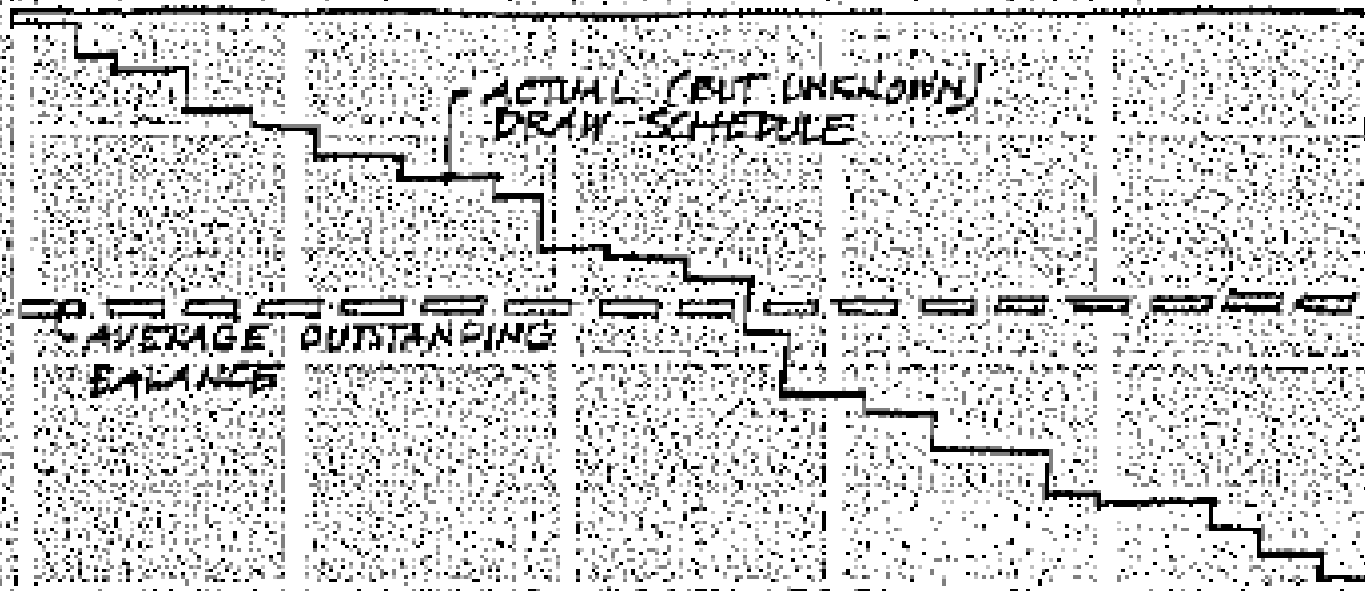
TWO DRAW SCHEDULES AND CORRESPONDING INTEREST PAYMENTS ON CONSTRUCTION LOAN

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- How can the amount of interest on the construction loan be estimated at early stages of planning when the actual draw schedule obviously cannot be known? In practice, this is done not by assuming some hypothetical draw schedule, but by using the concept of the average outstanding balance of the loan. It is customary to assume that on the average, about 50% or 60% of the full loan would be drawn, and interest is calculated on this average balance for the entire period.
- Contractors, who most likely have themselves borrowed money for materials, equipment, and labor, naturally are interested in getting paid earlier rather than later. Some contractors therefore have shown a tendency to "front-load" their bids, meaning that work to be completed earlier will be relatively more expensive than work to be completed later. This strategy could become expensive for the owner, especially of larger projects, because of the interest on the construction loan, as shown.



INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS



INTEREST ON AVERAGE OUTSTANDING BALANCE:

\$ 250	\$ 250	\$ 250	\$ 250	\$ 250
				TOTAL = \$1,250

ESTIMATING CONSTRUCTION LOAN INTEREST USING AVERAGE OUTSTANDING BALANCE

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- The project initially must be financed by a construction loan taken out by the developer, who then is responsible for paying it back. The lender assumes a considerable risk in such situations because, after all, there is no real collateral for the loan yet, except for the site. Should the developer default on the interest payments during construction and have to give up the project, the lender would be left with an unfinished project, most likely already in some trouble due to interrupted work and resulting damage to previously completed parts and materials stored on site, litigation with subcontractors who had not performed adequately or who had not been paid, and so on.
- For this reason, lenders tend to charge higher interest rates for construction loans than for other loans. For security in assessing this risk, the lender looks at the reputation and the financial situation of the developer, besides the quality of the planned project itself. Finally, because the developer expects to sell the project upon its completion, the loan terms reflect this expectation by providing for repayment of the principal in full at that time. Until then, only interest is charged.



INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- The situation for the buyer of the completed building is quite different. First there now is a completed building in a useful state to serve as the collateral for the loan. The lender thus assumes considerably less risk, which usually is reflected in lower interest rates for such loans than for the construction loan.
- Second, the lender is dealing with a different kind of borrower—for example, either a homeowner who intends to live in the house for a long period of time or an owner who expects to lease or rent the building to other tenants. In both cases, the loan cannot be repaid in full after a short time but must be paid off in small installments over a much longer period- This period—the mortgage term—in conventional fixed-rate mortgages, normally has been 20 or 30 years.
- For convenience the installments are arranged to be of equal size each period (Le., the same amount every month or year) and include both interest and at least a small share of the principal. Thus, the ratio of interest to principal in the payments changes over time. The first payment will consist largely of interest plus a small amount of principal; the last payment consists mainly of principal and a small amount of interest, and, with that payment, the loan is repaid.



INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

□ **What Does *Discount Points* Mean?**

A type of prepaid interest mortgage borrowers can purchase that lowers the amount of interest they will have to pay on subsequent payments. Each discount point generally costs 1% of the total loan amount and depending on the borrower, each point lowers your interest rate by one-eighth to one one-quarter of your interest rate. Discount points are tax deductible only for the year in which they were paid.

□ **Investopedia explains *Discount Points***

For example, on a \$200,000 loan, each point would cost \$2,000. Assuming the interest rate on the mortgage is 5% and each point lowers the interest rate by 0.25%. Buying 2 points will cost \$4,000 and will result in an interest rate of 4.50%.

Both lenders and borrowers gain benefits from discount points. Borrowers gain the benefit of lowered interest payments down the road, but the benefit applies only if the borrower plans on holding onto the mortgage long enough to save money from the decreased interest payments. Lenders benefit by receiving cash upfront instead of waiting for money in the form of interest payments over time, which enhances the lenders liquidity situation.

□



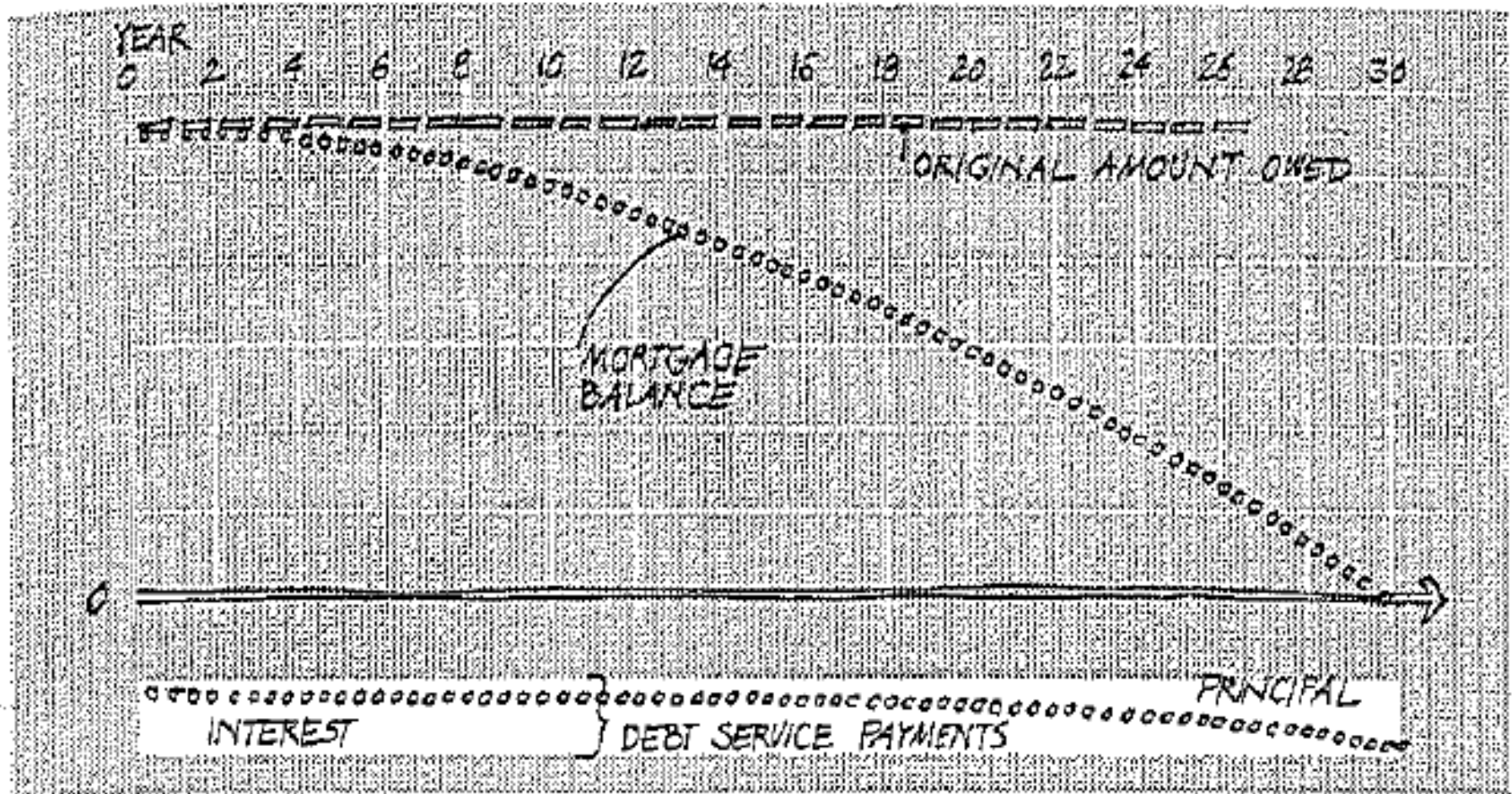
[investopedia.com](https://www.investopedia.com/terms/d/discount-point.asp)



[pinterest.com](https://www.pinterest.com/pin/123456789012345678/)



INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS



INTEREST TO PRINCIPAL RATIO & MORTGAGE BALANCE = TRADITIONAL MORTGAGE

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- In estimating the cost of financing, and assessing the terms of permanent financing arrangements, the following variables must be considered:
- The amount of the loan, called the principal.
- The equity or down payment (cash equity contribution).
- The loan-to-value ratio, which expresses the lender's policy or negotiated offer with respect to the relation" ships between the principal and the equity contribution.
- The length or maturity of the loan, also called the mortgage term.
- The interest rate
- The size of annual or monthly payments or debt service payments, as determined by the principal, mortgage term, and interest rate together.



INAR 413 BUILDING ECONOMICS
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FINANCING CONSTRUCTION PROJECTS

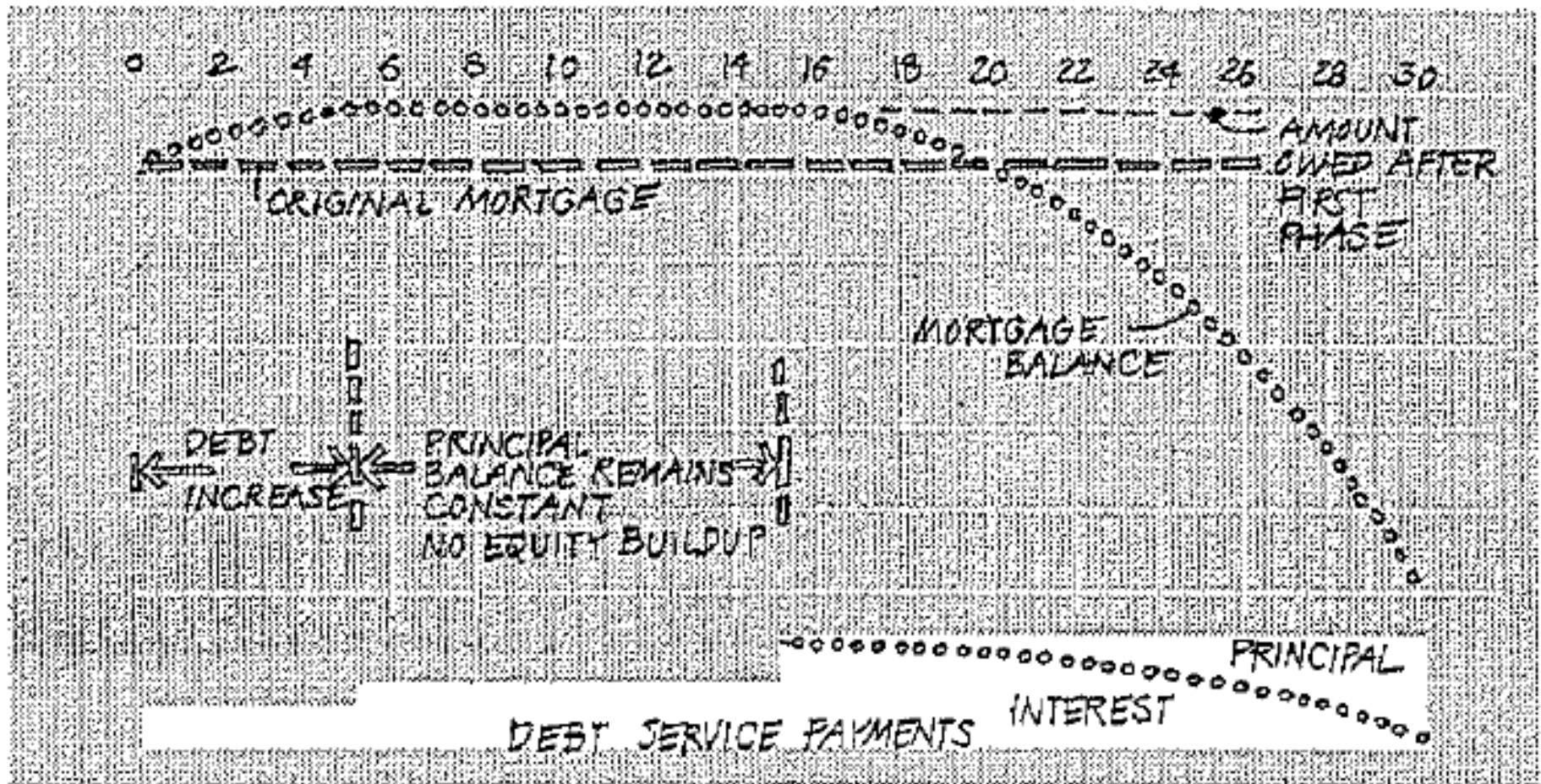
- Whether interest rates are fixed or variable (or adjustable). This feature often gives its name to the entire loan arrangement. In fixed-rate mortgages, the interest rate remains the same throughout the agreed upon mortgage term. In variable-rate loans, the interest rate can change, and this then changes the annual or monthly debt service payments.
- If the interest rate is variable, how often it can change. Some arrangements provide for rate changes after every three-year or five-year period of the term. Others let the interest rate change more frequently, following general economic conditions or other considerations.
- For variable rate loans, whether there is a "cap" or limit to how much they might change. This is especially important for adjustable rate mortgages in which there is no fixed schedule of adjustments. Typically, one then would look for a provision limiting the percentage by which the rate can change over a year. For example, the lender might agree that the rate would not be raised by more than two percentage points per year.



INAR 413 BUILDING ECONOMICS
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FINANCING CONSTRUCTION PROJECTS

- In any such variable-rate loans, what considerations determine how the rates will change. For example: they might be arranged to follow some index of average market interest rates; or they might be set at a certain number of percentage points above the Central Bank's (the interest rate at which the Central Bank lends money to the large banks), the average prime rate (the interest rate the large banks offer their best corporate customers), or some other prearranged pattern such as the anticipated earning pattern of the borrower.
- For some "new" financing packages, whether monthly payments have been kept low at the expense of the rate of equity buildup. The periodic payments may contain only a very small amount of retired principal, or none at all. This means that it will either take a very long time to pay off the loan, or the payments must be increased drastically later on. At the extreme, the arrangement may even provide for the monthly payment not to fully cover the interest in the early phases of the loan, which is equivalent to an increase of the amount owed, or "negative amortization."
- Especially for loans arranged at times of high interest rates, whether there is an opportunity for refinancing before the end of the mortgage term (that is, to pay off the loan and arrange for a new one), and what the conditions for such refinancing will be.

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS



A MORTGAGE WITH VARIABLE PAYMENTS; RESULTING IN NEGATIVE AMORTIZATION

INAR 413 BUILDING ECONOMICS
LECTURE 05
FINANCING CONSTRUCTION PROJECTS

- **Fixed-rate mortgage.** The "traditional" mortgage, with interest rates and therefore monthly payments remaining constant over the entire term—usually 20, 25, or 30 years. In times of rising or strongly changing market interest rates, banks are reluctant to offer these mortgages except at very high rates. For a while, they were not available at all.
- **Flexible-rate mortgage.** A mortgage whose interest rates can change, for example, according to some index. They may or may not have "caps" or limits as to how often and how much the rate, or the payments, can change.
- **Balloon mortgage.** A mortgage that resembles the traditional fixed-rate loan with payments calculated as they would be for a long-term mortgage, except that the outstanding balance comes due in three or five years. It then must be paid in full, or the loan must be refinanced at then current rates. Some balloon mortgages have payments that cover interest only, in which case there is no equity buildup.
- **Graduated payment mortgage.** Arranged for the young family," a mortgage with initially low payments that then rise and level off later on, corresponding to the estimated pattern of increasing earning power of the family.
- **Growing equity mortgage.** Mortgage in which the interest rates are fixed, but payments are arranged to rise on a schedule, to allow for a rapid payoff over a relatively short term (e.g., 15 years).
- **Shared appreciation mortgage (SAM).** A mortgage that represents one of several attempts to make the better borrowing position of larger companies (developers or builders, who can obtain larger loans at lower rates) available to the individual home buyer. In return for below-market interest rates and payments, buyers agree to share with the lender a certain percentage of any appreciation of the house upon resale.