present worth, which is called net present worth (NPW). Thus, the order of computation is different in Table 21.1 from that of equations (21.9 and 21.10), but the result is the same. Equations (21.9 and 21.10) are just a more general expression of the computational process than Table 21.1.

Note also that if the PV system owner is selling electricity and thus has a revenue (income) stream, that revenue is taxable as per equation (21.9). However, if the PV system owner is not selling electricity, then the electricity has a value to the owner and the term R in equation (21.9) can be used in the calculation of the system worth, but the taxation term is zero because $T = 0$. (The case of $T = 0$ is implicit in Table 21.1.)

Several other measures of system worth can be defined using the annual net cash flow defined by equation (21.9).

$$0 = \sum_{n=0}^{L} \frac{X_n}{(1 + IRR)^n} \tag{21.11}$$

where

IRR = internal rate of return.

Equation (21.11) is solved iteratively for the value of internal rate of return (IRR) that satisfies the equation. To determine if the investment in the PV system is acceptable, the IRR must be compared to a hurdle rate set by the owner. This rate may or may not be the owner's opportunity cost.

A less-sophisticated economic measure is the simple payback period defined by

$$0 = \sum_{n=0}^{\mathrm{PB}} X_n \tag{21.12}$$

where

PB = payback period in years.

The payback period is the number of years required for the inflows to equal the outflows. It is the time required to recover the initial investment in the system. This measure is referred to as *simple* because it does not consider the time value of money (there is no discounting). It also does not consider cash flows beyond the time when the investment is recovered. Simple payback is probably more useful, for example, to the homeowner who does not have the same tax and profit considerations as the business owner.

A measure of the intermediate complexity and usefulness is the discounted payback period, defined as

$$0 = \sum_{n=0}^{\mathrm{DPB}} \frac{X_n}{(1 + m)^n} \tag{21.13}$$

where

DPB = discounted payback period.

The discounted payback period (DPB) does consider the time value of money, but does not consider the cash flow after the recovery of the initial investment.