an individual's risk is through repeated contracts, for which the frequency of indemnity claims can be monitored and individual risk can be determined.

The Market for Lemons: Nobel laureate George Akerlof, in his classic paper, argues that the lack of information regarding a product may destroy the market for that product. He uses the example of the market for used cars. Suppose we have two types of used cars: good used cars and poor used cars. If a potential buyer of a good used car cannot distinguish it from a poor used car, the buyer is unwilling to pay the price for a good used car. Therefore, no one will be prepared to offer good used cars for sale, and the market for good used cars will not exist.

This is an example of adverse selection. The lack of information about the product characteristics in the market means other market participants cannot be sure of the quality of the product. This type of information problem arises in many markets, and is of special concern in insurance markets in which the risk characteristics of individuals must be determined. A prime example is crop insurance (Akerlof 1970).

3.6 The Theory of Regulation

Agriculture has a preponderance of regulations. Originally, regulation was seen as a good produced at no cost by government that was used as a response to some market failure. This view assumes that government is benign and that the political process will respond automatically to need. In his Nobel prize-winning work, George Stigler (1971) proposes an alternative view of regulation as a form of rent-seeking behaviour that has since changed the way many economists model the government.

Regulation is often used to limit the market power of firms because market power can lead to inefficient resource allocation (Stigler 1975; Strick 1990). At times, governments have introduced regulations that have forced firms with market power to price as if the firms were in a competitive industry. However, price regulation has not been without difficulty.

It is possible for the regulators to be captured by the regulated. This is interest-group theory in which concentrated groups of individuals affected by legislative decisions have an incentive to influence those decisions. Interest groups spend resources to lobby policymakers (Becker 1983). Stigler (1971) proposes

that the only people willing to spend large sums to present information to policymakers are those who stand to benefit directly from certain policy decisions. The greater the potential benefit, the more funds the interest group is willing to spend, and the more influence it can have. Likewise, because garnering information is costly, regulators will not necessarily hear counter-arguments. Thus, Stigler (1971) put forward the hypothesis that special-interest groups will have more influence over the regulators than will the general public because of their targeted lobbying efforts. This is the thesis of regulatory capture.

Stigler's (1971) hypothesis has been applied to supply management in Canada (Schmitz 1995b). Federal and provincial governments regulate the marketing activities of the Canadian supply management boards. For certain industries, prices are set by a cost of production (COP) formula agreed to by the regulators using information supplied by the producers. At times, the COP formula overstates producer costs, and often these costs are not challenged by regulators. Stigler's framework fits the rent-seeking arguments presented in Chapter 2. In the above example, effective rent-seeking behaviour is possible when the regulator is captured by producers.

3.7 The Search for Stability

In his book *The Search for Stability*, Schwartz (1959) emphasizes the need to stabilize the agricultural sector through government policies. This is a subject that has received a great deal of attention since the Second World War. Those who support agricultural policy contend that one of its main benefits is the provision of income stability. Unfortunately, however, in policy discussions it is rarely made clear what stability means or how it can be achieved.

3.7.1 Price Instability

The early literature focused on storage policies as a means to bring about price and income stability (Bieri and Schmitz 1974; Massell 1970; Oi 1961; Samuelson 1972; Waugh 1944; Wright and Williams 1984). The general approach is discussed with reference to Figure 3.5. Consumer demand is D and the stochastic supply is S' and S'', each of which occurs with a probability equal to one-half. Thus, equilibrium prices are P_1 and P_2, respectively. We assume that prices are stabilized at P_μ by means of a buffer-stock authority that buys excess supply $(Q'_S - Q_\mu)$ when S' occurs, and sells $(Q_\mu - Q''_S)$ when S'' occurs. Under a stabilization policy, in the event of S' consumers lose $(c+d)$, while producers gain $(c+d+e)$ for a net gain of (e). With S'', producers lose (a) but consumers gain $(a+b)$ for a net gain of (b). The average overall effect of

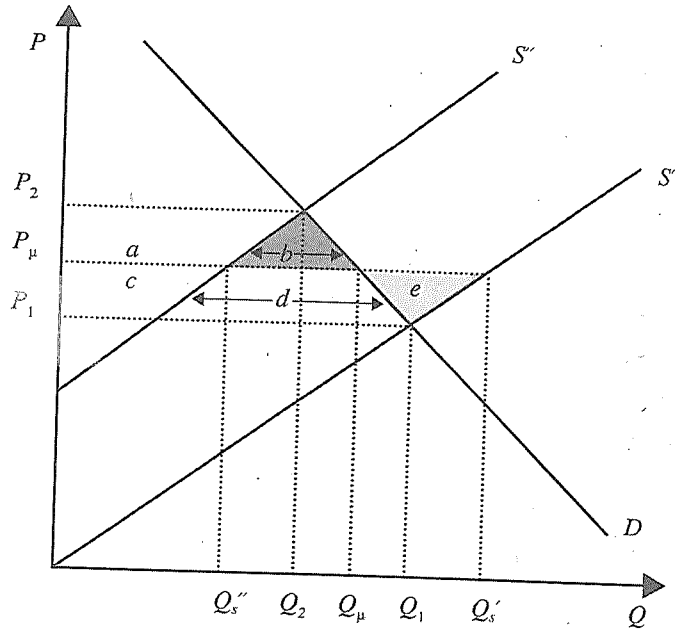

Figure 3.5 Massell's model of stabilization

price stabilization with a stock-holding policy is a net gain of $(b + e)$. Massell's result implies that the loss from stabilization for consumers is more than offset by the gain when producers are included in the model. As a caveat, in the Oi and Waugh framework, it is clear why producers prefer price instability given an uncertain demand. This is because at the high price output is large, and at the low price output is small. In reality, high prices generally correspond to low output, not the other way around. It is easy to make money in the Oi situation because of perfect foresight, just like it is easy to buy low and sell high if one knows in advance that high prices are just around the corner. The problem in reality, however, is the risk of buying high and selling low. The Oi and Massell models, in which instability is generated because of demand fluctuations, were applied by Tisdell (1972) to price stabilization schemes in the Australian wool industry. Tisdell concludes that stabilization of wool prices by the Australian Wool Commission may reduce the average annual net income of growers and of the manufacturers of wool.

A similar result can be shown when the source of instability comes about

from shifts in the demand curve. In this case, the gains to consumers from stabilization are greater than are the losses to producers. These results suggest that society benefits by stabilizing prices of storable commodities through a stock-holding policy. The results are dependent on the use of linear supply and demand curves. If non-linear curves are used, similar results can be derived, but they are not as straightforward. But even though there will be a net gain to society, there are both winners and losers from stabilization policies. Who wins and who loses depends on the source of instability (whether it comes from shifts in demand or shifts in supply). In this case, the Compensation Principle can be applied to show that stabilization can improve welfare.

For internationally traded commodities, the Massell (1970) results have to be modified. Some countries may prefer price instability to price stability even in a market setting in which supply and demand are both taken into account. However, when all countries are taken together, stability is preferred, although there are associated gainers and losers (Hueth and Schmitz 1972).

3.7.2 Income Stability

An important point raised by Newbery and Stiglitz (1981), as well as by Bigman and Reutlinger (1979), is that price stabilization enhances income variability in some cases. One can show this result using Massell's model of stabilization. In Figure 3.5, price fluctuations are caused by supply fluctuations. Without storage, producer revenues over the two periods are P_1Q_1 and P_2Q_2. If we have storage, then revenue increases because $2(P_\mu Q_\mu) > (P_1Q_1 + P_2Q_2)$. Storage, which stabilizes price, need not yield a stable income. When supply is at S', suppose the government stores $(Q'_S - Q_\mu)$ and pays producers P_μ. In that period, revenue is $P_\mu Q'_S$. In the next period, supply is S'', and the government releases the stocks $(Q'_S - Q_\mu)$. Producer revenue is now $P_\mu Q''_S$. The scheme is self-financing since government outlays for stocks equal the money received by government when stocks are released. However, producer income has a larger variance with government storage than it does if no storage occurs since $P_\mu Q''_S < P_2Q_2$ and $P_\mu Q'_S > P_1Q_1$.

There are two additional inferences that are worth noting that can be drawn from this example. First, even with government storage, producers still prefer price stabilization to price instability since $(P_\mu Q''_S + P_\mu Q'_S) > (P_1Q_1 + P_2Q_2)$. Second, in the absence of government storage, producers will store their commodity privately. Also, they may have the objective of income stabilization, which means they will store $(Q'_S - Q_\mu)$ for sale in a period of lower supply. Note an important result: With private storage, both income and price are stabilized.

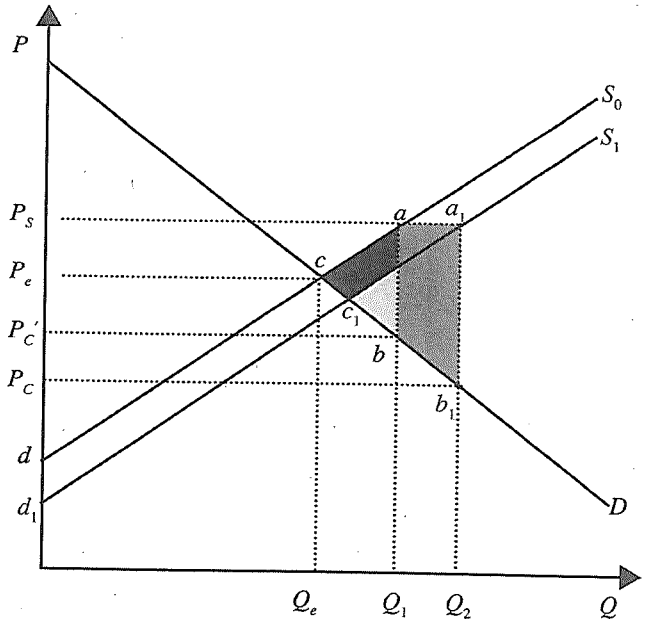

Figure 3.6 Supply response with reduced risk

To achieve price P_μ, producers must store $(Q_S' - Q_\mu)$ for which they receive no payment, and sell it in the following period. Thus, the degree of income variability generated by price stabilization depends on whether the public or the private sector does the storing. These models have been extended to the case of multiple commodities in which producers may prefer stability in one commodity set but not in others (Schmitz, Firch, and Hillman 1981). Also, consumers' preference for instability depends on many factors, including budget shares (Schmitz, Shalit, and Turnovsky 1981).

3.7.3 Shortcomings

3.7.3.1 Producer Uncertainty

Many of the early models on stability assume producers are risk neutral. However, many producers are risk averse; hence, variability in price or income will affect producers' decisions. Uncertainty is a cost to producers. As pointed out in Just (1974, 1975), a reduction in price or income variability may cause an outward shift in the supply curve if producers are risk averse.

The model in Figure 3.6 takes into account the impact of risk reduction on producers and the impact on supply response. Under a competitive equilibrium, expected price is P_e and expected output is Q_e. Consider a price support program that fixes price at P_S. In the absence of risk effects, the net cost of the program is (cba). However, suppose that the price support program not only raises prices but also reduces the price variance, which, in turn, reduces the risk faced by producers. Because of risk response, the new supply curve will become S_1. Part of the benefits of risk reduction accrue to consumers because of the lower food prices resulting from added supply. In terms of welfare changes, producers gain an additional (add_1a_1), consumers gain $(P_C'P_Cb_1b)$, but the additional taxpayers cost is $(P_C'P_Cb_1a_1ab)$. Thus, there is a net benefit from the price support program in the amount of $(dd_1a_1a - abb_1a_1 + cba)$.

Those economists and farm groups supporting farm programs often use the above analysis, implying that programs that are risk reducing can satisfy the Compensation Principle. This example underscores the potential impact of appropriately designed farm policies on farm risk and the implications of those risks on welfare measures.

3.7.3.2 Storing a Non-storable Commodity

One of the shortcomings of the above framework is that it cannot account for commodities that cannot be stored physically for lengthy periods (e.g., fresh meat). Some countries have attempted to stabilize income through the use of buffer funds. Producers and governments contribute to a fund so that payments are made to producers when prices are low. Buffer funds (i.e., monies) are used instead because physical storage is not possible.

The economics of using a buffer fund to stabilize income have been analysed by van Kooten and Schmitz (1985) and van Kooten, Schmitz, and Furtan (1988). What the analysis indicates is that there is always an income transfer from taxpayer to producer, because it is not possible to have an actuarially sound buffer fund. Thus, producers receive an above-average price that will encourage them to increase production. This causes production to increase and prices to decrease, thereby worsening the stabilization problem.

A model of the Canadian beef industry for the period 1980 to 1985 was constructed by van Kooten, Schmitz, and Furtan (1988) to estimate the cost of a national buffer fund for Canadian beef. Using historical supply variance and average prices, they calculate the effect of government transfers on producer prices. The cost of a buffer fund is significant because producers benefit from the fund with an annual transfer of between Cdn $100 million and Cdn $300 million.