ANALYSIS OF THE IMPACT OF THE INITIAL QUOTA SHARE ALLOCATION ON LONG-TERM QUOTA SHARE DISTRIBUTION

Appendix E

TO THE
RATIONALIZATION OF THE PACIFIC COAST
GROUNDFISH LIMITED ENTRY TRAWL FISHERY
FINAL ENVIRONMENTAL IMPACT STATEMENT

PREPARED BY
THE PACIFIC FISHERY MANAGEMENT COUNCIL
7700 NE AMBASSADOR PLACE, SUITE 101
PORTLAND, OR 97220
503-820-2280
WWW.PCOUNCIL.ORG

AND THE

NATIONAL MARINE FISHERIES SERVICE
7600 SAND POINT WAY NE, BIN C15700
SEATTLE, WA 98115-0070
206-526-6150

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Acronyms and Abbreviations

Acronym	Definition
IFQ	individual fishing quota
OY	optimum yield
QP	quota pound
QS	quota share

E.1 Introduction

This appendix contains a detailed analysis of the impact of the initial quota share (QS) allocation on long-term QS distribution. We start with some conceptual groundwork in Section E.2 ("Raw Fish Markets and Resource Rent Dissipation or Capture under Status Quo") and Section E.3 (" QP Markets and Interaction with Raw Fish Markets"). The discussion within these sections is presented in the following order:

1. Identify general economic principles.
2. Identify how those principles play out when the fishing industry is highly competitive (i.e., composed of many entities acting independently).
3. Identify what happens if one sector or the other is not highly competitive and define market power.

After that groundwork, we will get into the specific factors affecting QS flow in Section E.4 ("QS Flow among Groups (Independent of the Initial Allocation)"). Each subsection contains the following:

1. A description of the factors of interest and their conditions under status quo
2. A description of how those factors may change under an individual fishing quota (IFQ) program and influence the flow of QS (under fully competitive and less competitive conditions)

Finally, we will summarize the factors affecting flow of QS and consider the effect of the initial QS, allocation on these factors, and the long-term distribution of QS, assuming fully competitive and less than competitive conditions (Section E.5).

This provides the background for the section of Appendix A on the initial allocation among groups (Section A-2.1.1), the impacts of that allocation, how the impacts vary depending on who is given the QS, and differences between the short-term and long-term effects.

As we go through this discussion, it will be important to keep in mind that the markets of focus will be the raw fish market, the exchange between harvesters and processors, and the QS/quota pound (QP) market. Any discussion of the wholesale fish market (market into which the processors sell) will be noted when relevant. Some parts of the discussion will be simplified by focusing primarily on IFQ held as QP. QP are issued annually to those holding QS. Where it is necessary to consider the long-term stream of harvest opportunity, we will focus on IFQ held as QS.

Note: When this analysis was developed, the Council control limit options would have applied such limits to both the ownership of QS and QP. Under such circumstances, the QS control limits would have limited the amount of fish any owner of harvesting operations could take. With the decision to apply the control limit only to QS, entities would be restricted in the amount of QS they could own, but there would be no limit on the total amount of QP they could harvest on their vessels, so long as no individual vessel violates the vessel QP limit. Therefore, an entity could own as many vessels and harvest as much fish as it wanted (subject to antitrust considerations), but it would have to acquire all the QP it needs each year from those entities holding the QS. This change in policy will alter the conclusions in this appendix regarding the limitations of the QS system on processor ability to vertically integrate and harvester ability to horizontally integrate through ownership of additional vessels.

E.2 Raw Fish Markets and Resource Rent Dissipation or Capture under Status Quo

The price of QP will interact with the reported market price for fish. To understand these interactions and how breakdowns in the assumptions about perfect competition affect the expected outcome for QP, it is useful to first address status quo raw fish markets and the dissipation of resource rents.

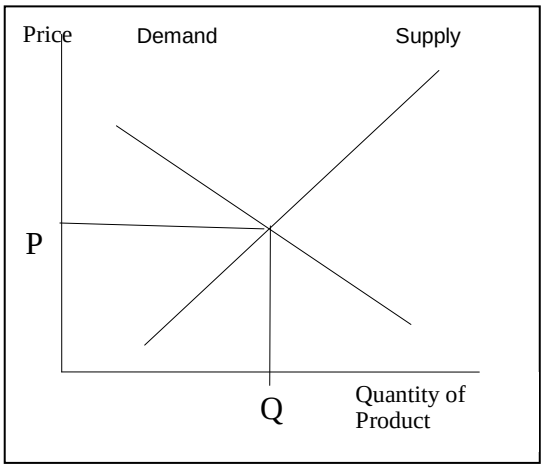

Figure E-1. Market price (P) and quantity (Q) at equilibrium (quantity supplied matches quantity demanded).

In a competitive market situation, the quantity of an item produced or demanded (the horizontal axis in Figure E-1) is related to its price (the vertical axis in Figure E-1). This is true for consumer goods and for factors of production (the inputs businesses need to support production and manufacturing). In input markets, the price a firm is willing to pay for an additional unit of an input (for example, raw fish) is related to the additional revenue that the firm will be able to generate as a result. The amount of an input supplied is determined by its marginal cost, the cost of supplying each additional unit of the input (the supply line ("curve") in Figure E-1). In general, as total production increases, the cost of producing each additional unit increases, resulting in an upward slope for the supply line. With respect to the demand line, or "curve," as in the market for consumer goods, as price increases, purchasers buy less. However, at higher prices, suppliers are willing to supply more. Conceptually, when the amounts supplied and demanded are identical, an equilibrium price is reached (price "P" and quantity "Q" in Figure 1). In practice, a stable equilibrium is seldom reached. However, this conceptual construct is still useful as an entry point for understanding the dynamics and interactions of the raw fish and QP markets under fully competitive conditions and conditions that are less than fully competitive.

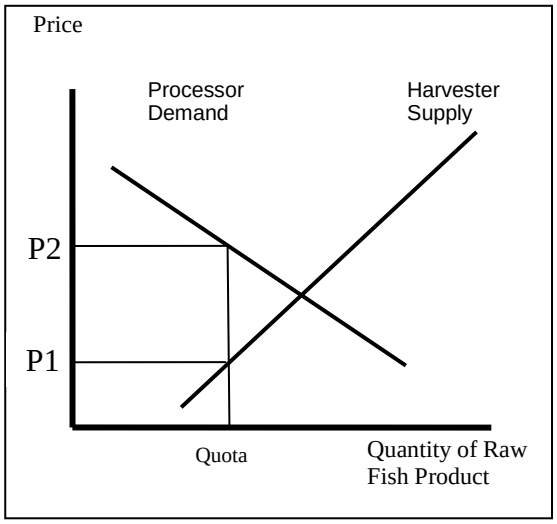

Figure E-2. Harvester cost (P1) and raw fish market price (P2) when harvest is constrained by a quota and rents are not dissipated through harvester capital investment.

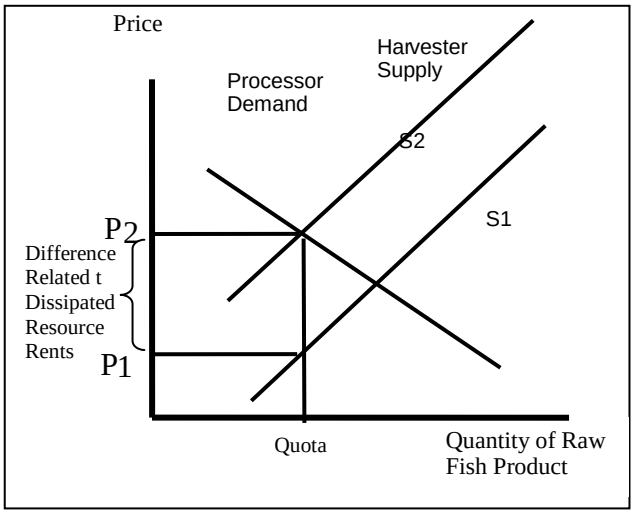

Figure E-3. In this example, it is assumed that harvesting and processing sectors are fully competitive and that harvester costs increase from S1 to S2, dissipating potential resource rents (see text for discussion of processor competition on the position o the processor demand curve and the resulting price).

Fisheries managers impose constraints to protect a resource. These constraints are generally below the amounts that fishermen would produce in the absence of a regulatory restriction ("Quota" in Figure E-2). In Figure E-3, the quota could be produced by harvesters at a cost of P1 and processors would be willing to pay price of P2. The difference between P1 and P2 reflects the rents that could be charged for the resource. However, these rents are not extracted. Therefore, processors and harvesters will struggle during price negotiations to exert bargaining power and capture a portion of the potential rents. However, to the degree that they are successful in capturing some of the difference between P1 and P2, their above-normal profits will cause them to expand their operations, and new entrants may be attracted, expanding industry capacity.

Under fully competitive conditions, new harvester entry and increasing competition raises harvest costs and dissipates rents, as illustrated by the shift from supply curve S1 to S2 in Figure E-3. The resulting price in this example is P2. The competition for harvest may also require processors to increase their investment in capital to levels above that necessary to process the fish. For example, if the fishery becomes season limited (e.g., becomes an Olympic fishery like the current shoreside and mothership sector whiting fisheries) processors with insufficient capacity to handle the product available during the season would invest in additional capacity to allow them to process in a time frame that matches the vessels' harvesting time frame.

The use of additional capital and variable inputs to increase their production capacity increases their costs and may reduce the price they are willing and able to pay for the product. In Figure E-3 this would be reflected by a downward shift of the processor demand curve. If the supply curve shifts up and the demand curve shifts down, the result would be that the lines would intercept above quota at some point between P1 and P2 for fully competitive harvesting and processing sectors, and all resource rents would be fully dissipated. In the shoreside nonwhiting fishery, cumulative trip limits have been implemented specifically to constrain the pace of the fishery. Therefore, there is not currently a race for fish, and the need for processors to invest in additional capacity is limited. Nevertheless, there may be some overcapitalization in the fishery due to the dramatic declines in optimum yields (OYs) for certain species

since the late 1990s. While there is not a race for fish in this fishery harvest sector, overcapitalization in this fishery has resulted from the investments occurring prior to the cumulative limit management regime imposed in the early 1990s, declining OYs, continuation of Olympic fishing conditions in other fisheries in which trawl vessels also participate, and government programs encouraging investment in domestic fishing capacity.

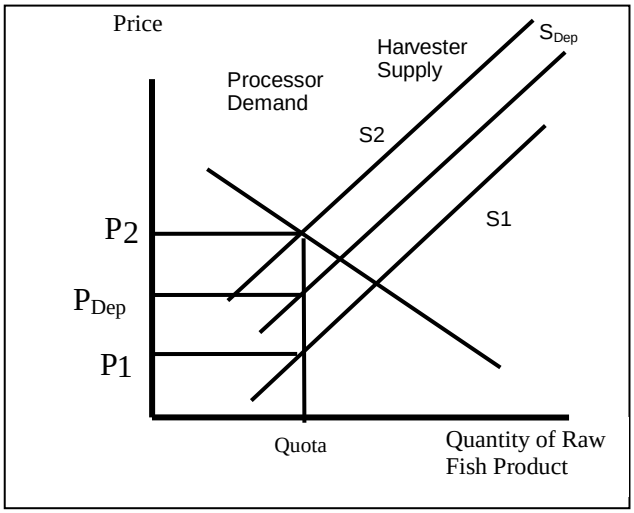

Figure E-4. Capture of a portion of the available rents (difference between P2 and PDep) through the example of a possible buyer (processor) exercise of market power.

In the case that either sector has market power, resource rents might not be fully dissipated. Market power means that members of at least one of the sectors can influence price to move away from the competitive equilibrium and use that power to capture a portion of the resource rent. Factors that make it likely that a sector will be able to exert market power are discussed in more detail in the section on QS flow among groups (page E-8). For harvesters, the effective exercise of market power to capture rents would also require some additional self-restraint or constraints such as barriers to entry.[1] Otherwise, we would expect harvesters to use the resource rents they capture as profits to support their competition for harvest, thereby raising their cost curve and, over time, dissipating the rents.

Suppose a quota constraint creates an opportunity to capture rents and the rents are not dissipated. If processors were able to exercise market power and capture all the rents, the price for raw fish would be P1 (Figure E-4). If processors are able to use market power to capture only a portion of the rent, they might be able move the raw fish price to an intermediate position. For example at an intermediate equilibrium, denoted P_{Dep}, processors would capture the difference between P2 and $P_{Dep.}$ If vessels were able to exert market power, they would capture the difference between P1 and $P_{Dep.}$ Unless the coordination that allowed them to exert the market power also enabled them to constrain their competition with one another, the difference between P1 and P_{Dep} would be dissipated as the industry increases capital investment and costs, thereby shifting the supply curve from S1 to S_{Dep} in Figure E-4. Along the same lines, returning to Figure E-3, if the harvesters are able to capture all of the available rent and not dissipate it with increased capital investment (the supply line remains at S1), the price for raw fish would be P2, and the rents captured by harvesters would be an amount associated with the difference between P2 and P1. If harvesters were to dissipate all of the rent in the race for fish, the harvester supply line would rise to S2.

E.3 QP Markets and Interaction with Raw Fish Markets

The IFQ program would create a new input that a vessel would have to acquire to bring raw fish to shore for sale: the QP. On one hand, harvesters will experience a cost associated with this new input; on the other hand, rationalization of the fishery is expected to drive down other costs of production. Figure E-5 picks up where Figure E-3 left off and assumes an equilibrium price has been established at P2 (for now

[1] The license limitation program provides some constraint on expansion of harvesting capacity and possibly supports increased cooperation among harvesters in that regard. However, there are still some permits that are unused or relatively unused. In addition, for the whiting fishery, where the race for fish continues, there continues to be an opportunity for capital stuffing (i.e., increasing the amount of capacity used with permits within the constraints of that permit).

ignore lines S3 and D2 and price P3), holding the product mix and quality constant. The net effect of an IFQ program is that the harvest supply curve depicted in Figure E-5 would stay at S2 with a price of P2, and the costs for all inputs except the QP would decline, perhaps back to S1.[2] The difference between P1 and P2 would reflect the value of the QP.[3] For those who must buy QP to participate in the fishery, the QP cost is a direct price that they would pay (their cost curve would be S2), and their profits would not vary much from competitive market equilibrium. For those who receive an initial allocation, the cost of the QP would be the opportunity cost (by holding on to the QP they lose the opportunity to gain revenue by selling the QP). They will collect the difference between P1 and P2 as rent as long as they remain in the fishery and continue to hold their initial allocations.

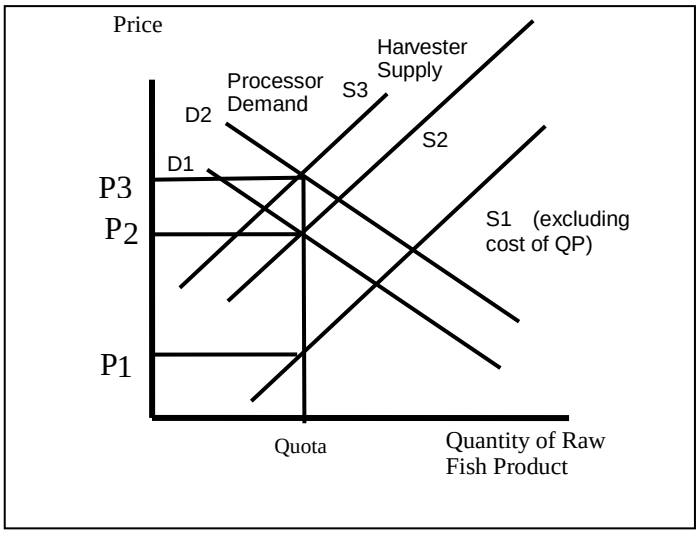

Figure E-5. Effect of a price increase through change in quality (movement of demand from D1 to D2) on value of the QP (difference between P1 and P3). (Line S1 would be the supply line of an efficient fleet if it did not have to pay for QP).

Often, the imposition of an IFQ program also creates an opportunity to increase revenues through increasing the product quality, selling when prices are higher, etc. In such a case, under competitive conditions, processor demand for the higher value products would be expected to be higher, for example, at D2 as compared to D1 in Figure E-5. This would result in an increase in the raw fish price from P2 to P3. In this example, it is assumed that the harvester costs exclusive of the QP would be expected to remain relatively unchanged (line S1 in Figure E-5), and the price of the QP would be expected to increase by the difference between P2 and P3 (increasing the harvester supply curve from S2 to S3). Thus for those who must buy QP, as the exvessel price goes up, their profit margins do not increase substantially. Those who already hold QS/QP experience an increase in financial profits. However, the firms with QS/QP still incur an opportunity cost by holding and not selling their shares. Therefore, from a theoretical perspective, in terms of assessing net economic performance, they, too, would not experience a substantial increase in real profits, though they would experience financial profits (because they do not have to buy the QP) and an increase in wealth in the form of the value of the QS asset that they hold.

[2] For purposes of simplicity, here it will be assumed that prices decline to S1. However, there will be other costs associated with harvester participation in the IFQ program. One major cost will be that of carrying observers.

[3] Assuming that industry bears the cost of observers, the cost curve would be higher, diminishing the difference between raw fish price and operating costs (excluding cost of buying QP). As this difference diminishes, the amount fishermen would be willing to pay for QP would decline, decreasing the market price of the QP.

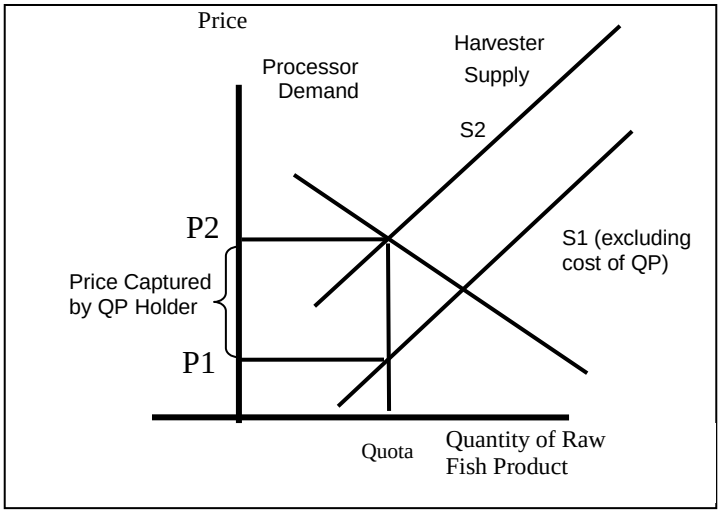

Figure E-6. Price captured by QP holder.

The actual market transaction prices reported for raw fish will be affected by who provides the QP for a transaction and the terms and conditions under which the QP is provided. In a competitive market (a large numbers of sellers and buyers acting independently), vessels not having to pay for QP will be willing to fish if they receive at least P1 for their deliveries of fish (their marginal costs excluding the cost of the QP), and processor will be willing to pay P2 for the raw fish (Figure E-6). If markets are functioning effectively, the person holding the QP should be able to sell QP to the harvester or the processor for the difference between P1 and P2 and capture the resource rent.[4] The QP holder could be the permit owner, vessel owner, crew, processors, communities, or others. The following examples show how reported raw fish price outcomes may vary depending on who provides the QP, assuming that both the harvesting and processing sectors are competitive.

- If a vessel holds its own QP, the price for the fish would likely be reported as P2, and it would include the value of the QP supplied for the transaction (in Figure E-6). P2 is composed of the vessel marginal cost (the minimum the vessel would fish for, P1 in Figure E-6) plus the price of the QP supplied by the vessel (the difference between P2 and P1).[5]

- If a processor holds the QP and buys from an independent vessel, the transaction price would vary depending on the arrangements made to transfer the QP to the vessel account (i.e., whether the QP price was wrapped together with the fish price). For example, if a processor provides the QP at no charge, then the exvessel price would be expected to be the vessel marginal cost (P1 in Figure E-6). If a processor sells the QP to the vessel, it would be expected that the price of the QP would be recovered in the exvessel price, which we would expect to be P2 if both sectors are fully competitive (Figure E-6).

Under a fully competitive situation, if both parties hold some of the QP that will be used in a particular landing, actual prices may be between the two extremes (P1 and P2). However, we would expect the amount of resource rent collected by each side to be the same as if the two parties had entered into separate sales agreements (i.e., both parties are expected to enter into the agreement only if they can earn as much revenue as they would working with a party who brought no QP to the transaction). Table E-1 contains **hypothetical** information used to illustrate the negotiating dynamic when both sides are competitive. In this table expected ex-vessel prices are shown based on the amounts of QS held by vessels and processors assuming the following:

1. Processor marginal revenue $0.40 per pound
2. Vessel marginal cost $0.30 per pound

[4] If the fishery is overcapitalized, the QP holder may not only capture a portion of the resource rent, but also a portion of the profits expected to otherwise accrue to harvesting capital, and possibly processing capital. This issue will be addressed in the section on impacts and the equity of the initial QS allocation.

[5] The difference between P2 and P1 represents the vessels opportunity cost for the QP (a profit it could have made by not fishing and selling the QP to someone else).

- In Scenario 1, all the QP is held by the vessel, and the expected price would be the processor marginal revenue ($0.40/lb) (i.e., the price would include the vessels marginal cost and the value of the QP, P2 in Figure E-6).
- In Scenario 2, all the QP is held by the processor, and the expected price would be the vessel marginal cost ($0.30/lb) (P1 in Figure E-6).
- In Scenario 3, the total transaction and the QP held are the sum of scenarios 1 and 2. The expected exvessel price would be an amount that brings both the processor and the vessel an amount of rent at least equal to what they would have earned if they entered into separate transactions with other partners; otherwise, they would not enter into the transaction. Only one price satisfies this condition, $0.366/lb.

Table E-1. Hypothetical example of price negotiations between harvesters and processors where both sectors are fully competitive.

	QP Owned by		Total Landing	Exvessel Price	Exvessel Value	Vessel Marginal Cost ($.30/lb)	Processor Marginal Rev ($.40/lb)	Rents for QP Collected by	
	Vessel	Processor						Vessel	Processor
Scenario 1	2,000 lbs	0	2,000 lbs	0.40	$800	$600	$800	$200	$0
Scenario 2	0	1,000 lbs	1,000 lbs	0.30	$300	$300	$400	$0	$100
Scenario 3	2,000 lbs	1,000 lbs	3,000 lbs	0.366	$1,100	$900	$1,200	$200 ($.066/lb)	$100 ($.033/lb)

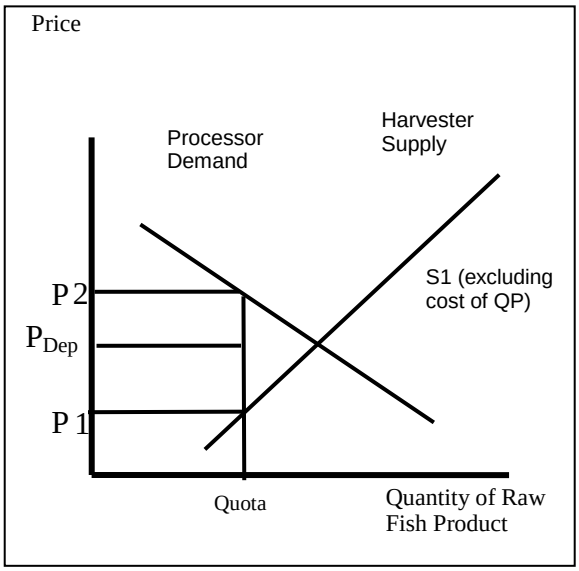

Figure E-7. Capture of a portion of the available rents (difference between P2 and P_{Dep}) through the exercise of market power by a buyer (processor). QP holders capture difference between P_{Dep}. and P1.

If the raw fish market is not fully competitive, there are two situations to consider. First, consider the situation of the entity that comes to the negotiating table with QP and desires to use his/her market power to increase profits. For this example, assume that entity is a harvester, and he/she is facing a fully competitive processing sector.[6] That entity can do no better than the price P2 in Figure E-7[7] At price P2, the entity receives its full marginal cost of harvesting (excluding the value of the QP, P1) plus the value of the QP (difference between P2 and P1). Similar logic shows the same result for a processor bringing QP to the table. If the processor tries to depress the price below P2, it will cut into the amount that is paid to the QP holder. In either situation, if the source of the price leverage is the QPs held, then the party attempting to excerpt market power could only cut into what it would reimburse itself for its own QP. This, then, implies that in an IFQ program where one side is fully competitive, the only way for the other side to gain from the exertion of market power is through the influence of the prices of transactions for which it does not

[6] For now, we will also assume the processing sector is fully rationalized, so there is no excess capacity.

[7] Unless it is able to achieve price discrimination (i.e., to charge firms for whom the delivery is more valuable more than other firms). Price discrimination is difficult to achieve and usually only arises in certain monopoly-type situations. Unless price discrimination can be achieved, the harvester can do no better than P2 with respect to a delivery for which it has QP.

hold the QP. For example, if a processor without QP was able to get a harvester to settle for a price of P_{Dep}, in Figure E-5, that processor would capture the QP related value reflected by the difference between P2 and P_{Dep}, the harvester would get P_{Dep} (before paying for the QP), and the QP holder would get the difference between P_{Dep} and P1. Of course, if the QP holder is not the harvester, the QP holder may decide to not take part in the transaction and seek an alternative buyer. Similarly, if a harvester without QP faced a processor and were able to get the processor to pay a price of P_{Dep} for raw fish, the harvester would earn his/her normal return of P1 plus additional profits reflected by the difference between P_{Dep} and P1, the processor would pay the price of P_{Dep}, and the QP holder would get the difference between P_{Dep} and P2. In both these situations, the entity exerting the market power is not the QP holder, and the QP holder loses the value unless the QP holder refused to participate in the transaction and accepts a better offer, which would be likely if the QP market is competitive.

Finally consider a possible case where both parties are in a position to exert market power (perhaps one sector is highly concentrated, and the other has many entities but is organized and working together cooperatively. Any exertion of market power by one side will come out of the value of the QP held by the other side or a third party. If the source of one side's power is that it holds a large amount of QP relative to the other side, the amount of additional rents it can extract is limited by the amount of QP held by the other side. If the QP holder is a third party (harvester or the processor), the QP holder's own ability to preserve his/her return on his/her QP holdings will depend on the competitiveness of the QP market and the QP holder's ability to exert power in price negotiations.

E.4 QS Flow among Groups (Independent of the Initial Allocation)

After the initial allocation, QS will be traded between members of the groups initially receiving the QS and any other entity eligible to own a U.S. documented fishing vessel (whether or not they actually own one). Traditional economic thinking holds that in the absence of transaction costs (the cost of buying and selling something) the QS will end up in the hands of those able to derive the greatest benefit from it independent of the initial allocation (Coase 1-44). However, transaction costs do exist. Recently, it has been demonstrated that other factors are at work such that the initial allocation may affect the long-term distribution of a resource (Hurwicz 49-74). In this section, we seek to put the question of initial allocation in the context of the expected flow of QS among groups no matter who receives the initial allocation. Once we cover the dynamics affecting this flow, we will be in a position to look at how the initial allocation might alter those dynamics.

In our previous discussion, we focused on the QP, which are issued each year to those holding QS. Our focus now turns to QS. The value of the QS is directly related to the value of the QP that will be issued for those QS in the future. We will consider the following factors from the perspective of their influence on the flow of QS among groups, independent of the initial allocation (also see the hexagons in Figure E-8).

1. Relative efficiency and intramarginal rents (page E-11)
2. Vertical integration, quasi-rents, and economic rents (page E-13)
3. Market power, horizontal integration and market share consolidation (page E-17)
4. Access to capital (demand) (page E-35)
    a. Time preference
    b. Risk
    c. Planning horizon
5. Access to capital (supply) – risk (page E-38)

Above, we identified that resource rents in the form of profits will be captured by the owner of the QS under an IFQ program, regardless of the nature of that entity (vessel, processor, crew, etc.). This result

changes only if a party not holding QP is able to exert market power, causing the price to deviate from the equilibrium for raw fish. In the following discussion, it will be important to consider other sources of profit and how they vary within and between sectors. This includes discussion of normal profits and intramarginal rent (see relative efficiency), as well as quasi-rents and economic rents (see vertical and horizontal integration). The following table provides a brief overview of these economic concepts and the technical terms we use for them.

Table E-2. Explanation of Terminology: return on investment, profits, and rents.

General Term and Description of the Concept	Economic Term
Normal Return on Investment: The level of profit required to compensate for capital investment (compensate the owners of capital). For industries that involve greater risk, greater return is required to compensate or attract capital investment. If the industry profit level is not sufficient to compensate capital, there will not be new investment.	Quasi-rents
Efficiency Profits: Profits earned by firms that are more efficient than others.	Intramarginal Rents
"Reasonable" Profit Level: Income necessary to pay for all labor, supplies, capital, and entrepreneurial expertise used by a firm at going market prices. This includes normal return on investment (quasi-rents).	Normal Profits (Zero Economic Rent or Zero Economic Profit)
Extra Profits (Abnormal Profits): Any earnings above normal profits are considered "economic profits" or "economic rents." Economic profits or rents attract new entrants.	Economic Rents (Above Normal Profits)
Cost of the Resource: Amount paid for the use of a raw resource. In open access fisheries management, no one collects resource rents; therefore, resource rents show up as economic rents, which attract new entrants until efficiency decreases to the point that only normal or less than normal profits are earned.	Resource Rents

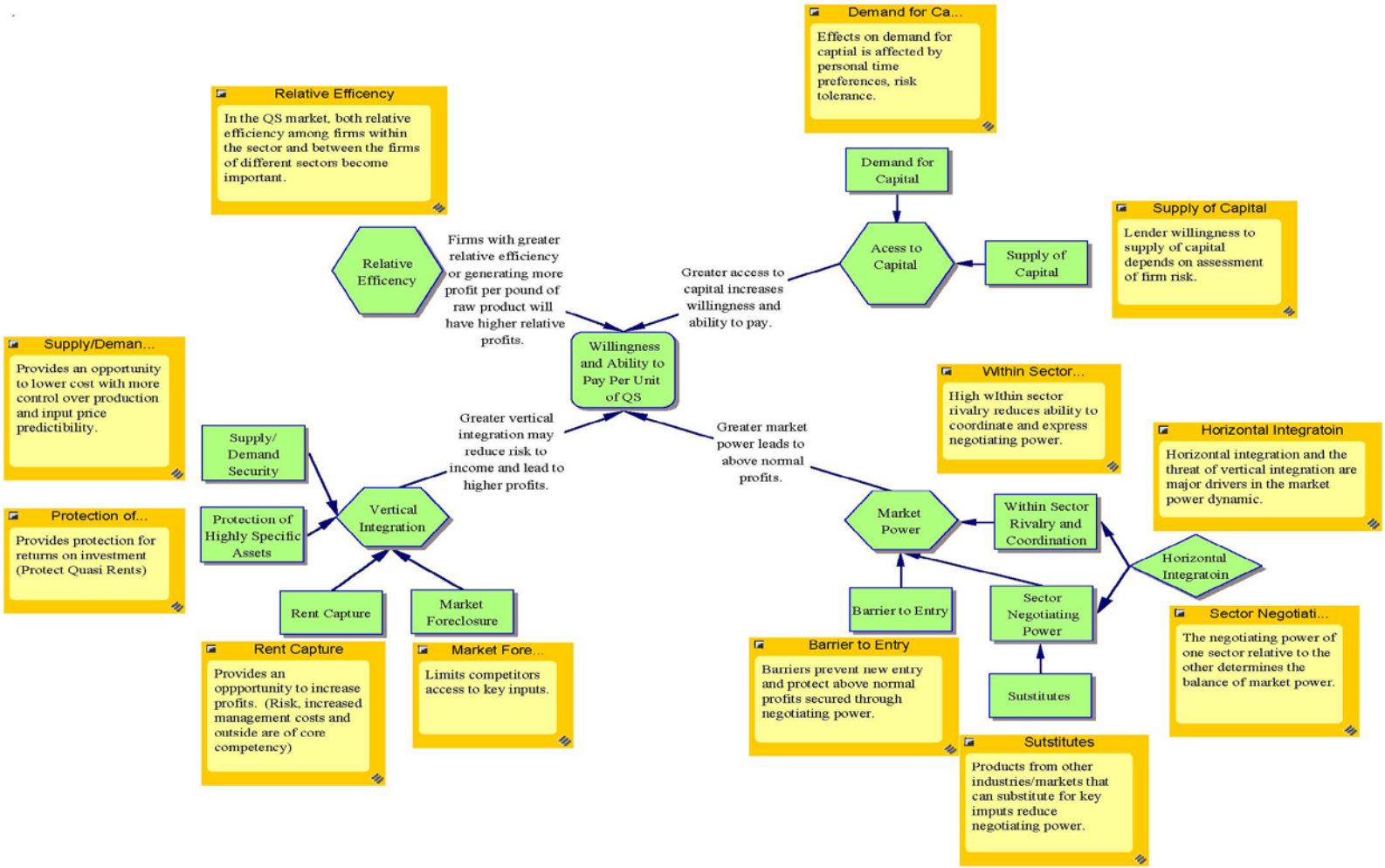

Figure E-8. Factors influencing QS flow among groups.

E.4.1 Relative Efficiency (Intramarginal Rents) and Profit Per Unit of Physical Input

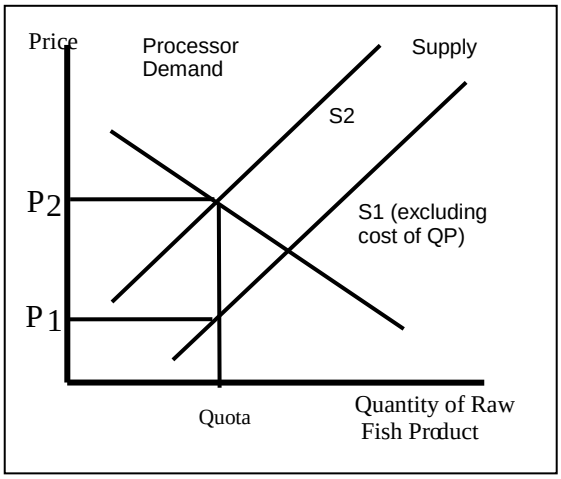

Figure E-9. Sector supply and demand curves and a point that represents a sale by a firm capturing intramarginal rents (difference between P1 and Pi).

If the harvesting and processing sectors are competitive, and the market and sectors achieve a long-run equilibrium, we would expect all participants in both sectors to be equally efficient. For both processors and harvesters, "economic" profits would be zero (all entities would have "normal" profit levels). In reality, however, even if an equilibrium market price is reached due to constant change, it is likely that some firms will be more efficient than others.[8] Additionally, it is possible for the business models of two firms to be equally efficient but produce different levels of total revenue per unit of input of a key raw produce. Those firms that are relatively more efficient and those firms that produce more value per unit of a key input (raw fish) are more likely to accumulate QS over the long run.

Firms that are more efficient than others in a sector earn extra profits, sometimes identified as intramarginal rents. Intramarginal rents are represented as the area between the price and the supply curve in Figure E-9 (the area between the horizontal line running out from P2 and the supply line S2, or the horizontal line running out from P1 and the supply line S1).[9]

Implementation of the QS program itself may affect both the harvester supply and processor demand curves. The harvester supply curve (excluding the cost of the QP) should go down as vessel efficiency improves, scale of operations increase, and less efficient capital leaves the fishery. The cost of complying with the program will limit cost savings and downward shift. If processors are overcapitalized or involved in the race for fish, the height of the processor demand curve under IFQs may increase as the amount of capital and other costs decline (as processor costs decline, the they would be expected to be willing to pay for acquisition of raw fish product increases). The IFQ program may have a differential effect on the profits of one sector as compared to that of another. The IFQ program appears to provide more direct mechanisms for the harvesting sector to improve operational efficiency as compared to processors (**Table** E-3). A harvester without QP would be forced to leave the fishery, while there is no mechanism that directly forces some processors to leave their sector.

[8] The long-term equilibrium in which all firms are equally efficient is rarely, if ever, reached.

[9] This explanation is a simplification to illustrate the main point. For a complete and technically accurate explanation of intramarginal rents and their relation to resource rents, see Coglan and Pascoe (Coglan and Pascoe 219-28).

Table E-3. Conditions leading to overcapitalization and opportunities for efficiency improvements for harvesters and processors in the nonwhiting and whiting sectors.

	Nonwhiting		Whiting	
	Status Quo	**IFQS**	**Status Quo**	**IFQs**
Harvesters	The race for fish occurred primarily in the 1980s and early 1990s. Imposition of 2-month cumulative limits and license limitation strongly muted capitalization. Overcapitalized state compounded by harvest contraction. Operational inefficiencies from constraints of 2-month cumulative limit management.	The IFQ program directly provides an opportunity for increased efficiency through consolidation of QS, transfer of operations to more efficient producers, flexibility in determining harvest strategies (timing and species mixes), regulatory stability and more direct control over planning.	Overcapitalized in race for fish. Operational inefficiencies from race for fish.	Same as for the non-whiting fishery with the addition of the opportunity to improve efficiency through more control over the pace of fishing and improved product quality with better handling.
Processors	Overcapitalized through harvest contraction. Operational inefficiencies from constraints of 2-month cumulative limit management.	Processors will have less certainty about the expected flow of product except to the degree they can influence product flow through the prices they offer or by acquiring QS. Over time, excess capital will diminish but the IFQ does not provide a direct mechanism for consolidation of processing opportunity (processors without QS can continue to compete for deliveries by vessels with QS).	Overcapitalized in race for fish. Operational inefficiencies from race for fish.	Processors will be gain efficiency with the slower pace of harvest and may be able to increase the value of their product with better handling or the development of higher value product forms. Over time, excess capital will diminish but the IFQ does not provide a direct mechanism for consolidation of processing opportunity (processors without QS can continue to compete for deliveries by vessels with QS).

See Sections 4.9 and 4.10 for discussions of the efficiency effects of the IFQ program on the trawl and processing sectors, respectively. Note that the existence of differences in relative efficiency within a sector depends on the industry not reaching a complete equilibrium and is independent of whether a sector has been able to exert market power and influence price away from the market equilibrium.

One of the factors determining the flow of QS will be the amount of profit a firm is able to generate with that QS on a per unit of raw product basis. Profit per unit of raw product and overall efficiency may vary from one another. By way of providing a conceptual example, consider grain farming and the production of bread. Assume that both the grain growing and grocery industries are competitive, both with normal returns on investment, and that grain is the key input without which there would not be a loaf of bread to sell (there are no substitutes for grain). We know that there are only a few cents worth of grain in a loaf of bread that may cost several dollars. Moreover, we know that on a per unit basis the farmer's profit is a fraction of those few cents, while the grocer's profit is a larger amount, some fraction of the several dollars that the loaf of bread costs. Thus, in a competitive market, the financial profit both earn may be similar, but the amount of profit per unit of the raw product may be substantially different. If each are now offered the opportunity to insure their profit based on a rate per unit of grain, the grocer will be willing to pay more because he has a greater dollar profit at risk per unit of grain. From this viewpoint, it is possible to demonstrate the potential for two companies operating at different points in the production

chain with equal relative efficiency on a dollar basis to generate different levels of profit on the basis of units of raw fish. The point of this discussion is not to identify a particular direction that QS is likely to move, but to establish conceptually relative profitability per unit of a key raw product could operate to drive the distribution of QS in a direction away from the firms with greatest relative efficiency when all inputs are taken into account. If processors have greater profit per unit of raw product, they may be willing to pay more for QS to secure access to the resource. On the other hand, to maximize profits, it is likely that they will hire the most efficient vessels to use the QP they are issued each year.

A number of other factors that affect efficiency will be influenced by the creation of an IFQ program. Some of these are discussed below in sections on integration and access to capital.

E.4.2 Vertical Integration, Return on Investment (Quasi-rents), and Above-normal Profits (Economic Rents)

Vertical integration or control occurs when a firm owns or exerts control over its suppliers or customers.[10] Businesses may vertically integrate to increase technical efficiency,[11] increase economic efficiency by internalizing transaction costs, and/or seek to exert market power (Perry 183-255). A processor that also owns a harvesting operation is a vertically integrated company. In commercial fisheries, some factors that may encourage vertical integration are as follows:

- Supply/demand market security
  - Price
  - Quantity
  - Quality
  - Timing
- Protection of profits from assets that are not easily employed in some other use ("highly specific" or "nonmalleable" assets)
- The capture of profits from another level of the production chain (rent capture)
- Preventing competitors from acquiring a key input – for increasing market share (market foreclosure)

(adapted from Dawson 1-125)

Increased management costs and the risks entailed in expansion beyond areas of core competence may be a downside of vertical integration.

QS ownership does not provide harvesters with a direct opportunity to vertically integrate in that QS are required for harvesting and provide no opportunity to direct or control processing operations.[12] Therefore, discussion of the opportunities that an IFQ program may create for harvesters to vertically integrate is taken up in the context of the IFQ program's effect on market power (see section, "Market Power, Horizontal Integration, and Consolidation" in the following).

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[10] Vertical integration or vertical control: Ownership or control of (1) suppliers (backward integration, e.g., a buyer owning a vessel), (2) buyers (forward integration, e.g., a vessel owning a buyer). Some companies engage in both forward and backward integration (balanced integration). Horizontal integration is the term used for one firm owning another that is producing the same outputs (e.g., one harvesting company owning another harvesting company).

[11] An example of technical efficiency is the integration of the steel production process such that already heated material does not have to be reheated for the next phase of the production process. At this point, technical efficiencies have not been identified with respect to the harvester processor interface.

[12] Once the IFQ program is created, the ownership of QS itself might be considered a type of vertical integration (i.e. ownership of the QS gives the harvester direct control of an essential factor of production, the QP). Elsewhere in this document, ownership of QS is sometimes referred to as a form of vertical integration.

There are a number of reasons to expect that processor vertical integration might increase under IFQs:

- The opportunity to own QS may provide a less expensive way for processors to respond to existing pressures for vertical integration (pressures to ensure market security or protecting assets that may not be easily transferred to other uses, nonmalleable assets).
- If there are above normal profits in the harvesting sector because of existing market power, or an increase in harvester market power as a result of the IFQ program (see following section, page E-17), the opportunity to capture these profits (rent capture) would create additional incentive for vertical integration through direct ownership of a harvesting operation. Acquisition of additional QS would be expected to accompany this integration.
- The exclusivity of QS provides a new opportunity for processors to increase their market share by acquiring QS and, thereby, foreclosing the opportunity of competing processors.

Processors that are already vertically integrated through ownership of vessels might have more incentive to acquire QS to protect their profits than firms that are not vertically integrated. For entities that own vessels, the acquisition of QS will protect both the profits from their harvesting operations and processing operations.

While there are reasons to expect that an IFQ program might lead processors to acquire QS in response to changing incentives and opportunity for vertical integration, control limits applied to QP would substantially limit a given processor's ability to use IFQ ownership to vertically integrate. For some processors, control limits could even reduce existing levels of vertical integration (immediately, if there is no grandfather clause, or over time as the grandfather clauses expire). Vertical integration through direct ownership of vessels would be constrained by control limits applied to QP. For example, assume a processor owns vessels that operate using amounts of QP that put the processor at a QP control limit. The processor would not be able to expand its vertical integration by acquiring additional vessels because it would not be able to acquire additional QP for additional vessels, since any such acquisition would put the processor over its QP control limit. Therefore, a control limit applied to QP would limit some processors' ability to acquire both QP and additional vessels. In its final preferred alternative, the Council applied control limits only to QS, not to QP. Therefore, a processor desiring to expand its harvesting operation will be able to do so but will not be able to support those operations with QS (each year it will have to acquire QP from other QS holders).

Vertical integration entails a firm taking on management costs related to merging the newly acquired means of production. If a firm is already vertically integrated and is just expanding the amount of that integration, there may be little additional risk. However, if the firm were extending beyond its area of core competency for the first time, it would be taking risks that could lead to higher production costs until full competency is developed. Managing a skilled crew and operation of a fishing vessel requires knowledge substantially different from the operation of a processing facility. The implementation of an IFQ program would provide processors of raw fish some opportunity to extend their control over supply production without necessarily having to incur the management costs and risks associated with control over a fishing vessel. By holding QS, a processor would be able to offer QP to the available fleet and have more leverage to control the timing of the delivery of those QP. However, while holding the QP provides the processor with an additional degree of vertical control, it is not enough to entirely free the processor from uncertainty about the price it would have to pay to get the raw fish delivered in the fashion it desires. The vessel would still be an independent operation. For example, even if the processor holds the QP, if the vessel also has its own QP, or there are competing processors in the area, it may still have to offer a higher price for the raw fish to get the desired delivery terms (time and quantity). Ownership of the underlying QS would secure QP price certainty for the processor and provide substantial leverage, but not complete certainty with respect to the raw fish price.

E.4.2.1 Supply/Demand Market Security

In general, price, quantity, quality, and timing are market security issues that can be addressed through vertical integration. With respect to quantity in a delivery, quality, and timing, processors can influence the delivery of an independent harvester through price negotiations or general market offerings. However, doing so involves transaction costs, which can be avoided with vertical integration. Vertical integration allows the producer to plan and control production and, most important, to know price (Arrow 173-83). For example, with respect to timing and quantity, the producer can more efficiently allocate labor and assets that are fixed for the period. It is also easier for a processor to control production quality when the employees work for the processor rather than the harvester. In situations where investment to support production for an upcoming period must be made with only partial or uncertain information about market price for key inputs, there will be a tendency for firms to vertically integrate. Moreover, in such a situation, this tendency for vertical integration will also encourage horizontal integration and the exertion of market power (Arrow 173-83). Under an IFQ program, the opportunity to own QS would provide processors a lower cost means for vertically integrating for market security.

E.4.2.2 Asset Specificity (Malleability) and Quasi-rents

Highly specific (unmalleable) assets are those that cannot be easily transferred to other uses if access to a key input is lost. The value of the asset that is not recoverable through transfer to another use is considered a sunk cost or sunk portion of the asset. Consideration of asset specificity has to take into account not only the alternative use of the asset but also the cost of moving the asset into the alternative use. The difference between the value of the asset in its current use and its value in the next best use is the *quasi-rent.*[13] Quasi-rents are considered a part of "normal rents" or "normal profits." They represent the return on investment that is necessary to attract and maintain capital in an industry.

The profit a buyer needs to pay a return on capital investment (quasi-rents) may be subject to capture when the number of suppliers is limited. For example, if one of a very limited number of suppliers selling an input knows a customer has equipment that must have that input (that there are few substitute inputs) and that the customer's equipment is not easily transferred to a different use, that supplier may be able to negotiate a higher price and capture some of the buyer's profit otherwise needed for a return on investment. Alternatively, a customer who is buying from a supplier that has a very unmalleable asset might be able to capture some of the suppliers return on capital investment. Such a circumstance might arise if there are a limited number of customers and a product that is highly specific in its use and its availability. An example would be a vessel with a hold full of fish and no pre-agreed-upon buyer. In this case, the fish are the unmalleable asset. Thus, specific assets earn a return that is subject to capture when there are market imperfections. The capture of these profits can only be sustained over the short term; otherwise, the firm losing the profit will not earn enough to replace its capital and will eventually be forced to leave the industry.

In the section above on the interaction of QS and raw fish markets (page E-4), we noted that when the raw fish market is fully competitive the QP owner would be expected to capture resource rents. With fully competitive markets and overcapitalization, the QP owner may capture both the resource rents and some of the quasi-rents. In an overcapitalized situation, firms seeking to ensure they have sufficient product for optimal production levels will bid away some of the profits (quasi-rents) that would otherwise go to returns to capital. However, this would be a short-term phenomenon. As assets age, deteriorate and are not replaced—all else being equal—QP prices would be expected to decline. The decline in QP prices would yield back the profits for return on investment to induce new investment. [This dynamic is

[13] The terms "economic profits" or "economic rents" occur when profits are above normal. See the following section for additional discussion of economic rent.

discussed in more detail in A-2.1.1.a, in the sections on "Investment, Dependence, and Disruption," and impacts on "Buyer/Processors."]

E.4.2.3 Rent Capture and Economic Profit (Economic Rent)

Vertical integration is also a way for one sector to capture another sector's economic profit (economic rent). Economic rent is any profit that is earned above that necessary to pay all costs, including the cost of recouping the original capital investments. Economic rents are termed "above normal" profits.[14] Vertical integration may be through forward integration (a harvester buying a processor) or backward integration (processor buying a harvester). In determining whether vertical integration will increase its profits, a firm would have to consider increased management costs and risk associated with expansion of the business beyond its area of core competence.

When both sides of a market are competitive and at equilibrium, there would be no above-normal rents to capture through vertical integration. However, if one or both sides are exerting market power under status quo, or become able to exert power as an outcome of the IFQ system, then there is an increased incentive to vertically integrate to capture rent (see the following section on market foreclosure and the section discussing horizontal integration, starting on page E-17). Firms able to capture economic rent will place more value on QS and have more incentive to buy QS to secure access to their key input.

E.4.2.4 Market Foreclosure

Firms may vertically integrate to limit their competitor's supply. While vertical integration occurs under status quo, use of that integration to foreclose a competitor's market is difficult. Any additional harvesting capacity acquired by a processor competes with existing harvesting operations, effectively reducing the two-month cumulative limits (or the season length, in the case of catcher vessels participating in the whiting fishery). It might be argued that the license limitation program makes it difficult to add capacity. However, latent permits and permits that are not used to full capacity offer opportunity to expand capacity. Further, even if a processor acquires a fully utilized permit and vessel, capacity could be expanded if the competitor losing deliveries from that permit and the vessel compensate by bringing one of the latent or underutilized operations on line. Whether or not IFQ would become a key production input for which there is no substitute, the creation of an IFQ system would provide a new opportunity for entities to foreclose a competitor's access to another key input (raw fish) and expand market share through vertical integration by the purchase of QS. Alternatively, if prevented from acquisition of QS through accumulation limits, a processor might secure a contract for delivery by a vessel with QS. Since no one else could purchase the fish associated with the QS assigned to that vessel, this would be a form of vertical control and market foreclosure. However, use of such contracts by processors could be counted toward a processor's QS/QP accumulation limit. Whether accumulation control limits would apply to marketing commitments secured by this type of a contract would have to be determined.[15] Foreclosing a competitor's access to an essential input (raw fish) will become more feasible under an IFQ program. This could lead to further consolidation in the processing sector, as discussed in the following section on market power.

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[14] Economic rent does not include quasi-rent since quasi-rents are necessary to maintain an asset in the industry over the long run (i.e., to provide incentive for future investment). The intramarginal rents earned by firms that are more efficient than others may be economic rents (discussed in the section on relative efficiency, page E-11). In addition, above-normal profits earned by firms exerting market power would be considered economic rent.

[15] While under a control limit, fishery managers would not directly monitor these contracts. If suspicion arises that an entity is exceeding a control cap via the use of private contracts, that circumstance could be investigated, and at that time, contracts would be evaluated as potential violations of the control cap.

E.4.3 Market Power, Horizontal Integration, and Consolidation

"Market power is viewed as the ability to maintain ***long-term abnormal profit…***" (Poole and Van de Ven -429). Market power enables firms to move price away from the competitive, market-determined equilibrium. In a fully competitive market, no firm or sector has market power because none can influence price away from the equilibrium. If a firm is able to achieve above normal profits through the expression of market power, they will be willing and able to place a higher value on the QS because the QS represents a larger stream of profit to them than to other firms. Thus if a firm or sector has market power under status quo and it is maintained under the IFQ program, or if the firm or sector establishes market power under the IFQ program, QS will flow in the direction of the entities with market power.

Market power is influenced by the following:

- Rivalry and coordination within a sector (page E-17). Effective exertion of market power requires coordinated action and coordinated action is affected by the degree of rivalry within a sector.
- Relative bargaining (negotiating) power between sectors (page E-21). The bargaining power of the sector vís-a-vís another sector is affected by current conditions and threats of longer-term recourse. This topic will be addressed in three parts:
  - Threat of substitutes
  - Harvester bargaining power
  - Buyer/processor bargaining power
- Barriers to entry (page E-23). Unless barriers to entry can be maintained, higher profit will attract new entry that will then disrupt market power.
  (adapted based on (Porter))

One of the major themes that shows up in the consideration of rivalry, coordination, and bargaining power is sector concentration (the number of firms and whether market share is relatively evenly spread among the firms, or is spread among just a few). As concentration in a sector increases, ability to exert market power increases. Two processes affect concentration:

- Horizontal integration—occurs when one firm in a sector acquires another or when firms within a sector merge.
- Market consolidation—occurs when existing firms expand market share (with other firms losing market share and potentially exiting the business).

In the following sections, we will address each of the factors influencing market power and then turn to the question of how implementation of an IFQ program may change these factors and thereby influence market power. These sections help to set the stage for addressing the question of how the initial allocation of QS affects the longer-term distribution of QS.

E.4.3.1 Rivalry and Coordination

Market power requires some form of coordinated action within the sector to move the price away from the market equilibrium (away from the price that results when there are many independent participants on both sides of the market transaction). In some situations, there may be legal issues if that coordination is jointly planned. On the other hand, sometimes a single firm acts as a price setter with other members of the sector following that firm's lead. Such coordination through smaller firms following the lead of larger firms is occasionally seen in the airline industry and some other industries with a structure similar to that of west coast groundfish processors. Coordination also may occur among many entities, as was attempted with mixed success during the mid-coast groundfish trawl vessel tie-up during price negotiations in

March-April 2007. Ability to coordinate within a sector depends on rivalry. For example, rivalry among harvesters increases the threat that a harvester might lose its market to a competitor during difficult price negotiations with a particular processor. A number of factors affect degree of rivalry. These factors are described in the following text box (Porter).

Within-sector Rivalry (Porter) (this summary adapted from http://www.quickmba.com/strategy/porter.shtml)
The intensity of rivalry is influenced by the following industry characteristics:

1. **A larger number of firms** increases rivalry because more firms must compete for the same customers and resources. The rivalry intensifies if the firms have similar market share, leading to a struggle for market leadership.
2. **Slow market growth** increases rivalry as firms fight for market share in order to continue growing. A firm's growth does not rely on market share competition in a growing market.
3. **High fixed costs** result in an economy of scale effect that increases rivalry. When total costs are mostly fixed costs, the firm must produce and sell at near capacity to attain the lowest unit costs. Rivalry intensifies as firms fight for customers for their production.
4. **High storage costs or highly perishable products** cause a producer to sell goods as soon as possible. If other producers are attempting to unload inventory at the same time, competition for customers increases rivalry.
5. **Low switching costs** increases rivalry. When a customer can freely switch from one product to another, there is a greater struggle to capture and retain customers.
6. **Low levels of product differentiation** are associated with higher levels of rivalry. Brand identification, on the other hand, differentiates production and tends to constrain rivalry.
7. **Strategic stakes are high** when a firm is losing market position or has potential for great losses or gains. This intensifies rivalry.
8. **High exit barriers** exist when there is a high cost for abandoning production. This intensifies the rivalry to remain in the sector. High exit barriers cause a firm to remain in an industry, even when the venture is not profitable. A common exit barrier is asset specificity. When the plant and equipment required for manufacturing a product are highly specialized, they are difficult to liquidated when demand within the sector is weak and the assets cannot easily be used in other industries.
9. **A diversity of rivals** with different cultures, histories, and philosophies make an industry unstable. There is greater possibility for mavericks and for misjudging rival's moves. Rivalry is volatile and can be intense.
10. **Industry shakeout** periods intensify rivalry. When an industry becomes crowded with competitors, and there are insufficient key inputs or insufficient product demand to support all participants a shakeout ensues, with intense competition, price wars, and company failures.

The factors affecting rivalry are listed in Table E-4 with a qualitative evaluation for the harvesting and processing sectors. This evaluation indicates that conditions for high rivalry would be expected in both sectors. High rivalry leads to shake out, which can lead to concentration of the type that is seen in the processing sector (greater concentration reduces rivalry because of the interdependence it creates among the firms as they deal with suppliers and customers).

Table E-4. Assessment of factors influencing within sector rivalry for harvesters and processors.

Factor Causing Greater Rivalry	Harvesters	Processors
1. A larger number of firms with similar market shares	+ More harvesters than processors. + Entities with similar market shares. *Note: Potential sector participants include latent permit holders.*	- Fewer processors than harvesters, Small number of firms. Very restricted in some localities. - Market shares highly concentrated, going mainly to a few companies.
2. Slow market growth	+ Yes	+ Yes
3. High fixed costs relative to variable costs	? Possibly	+ Yes
4. High storage costs or highly perishable products	+ Yes	+ Yes
5. Low cost for customers to switch suppliers	+ Yes	+ Yes
6. Low levels of product differentiation	+ Yes	N/A
7. Strategic stakes are high	+ Moderate for nonwhiting, high for whiting	+ Yes
8. High exit barriers	+ Yes	+ Yes
9. A diversity of rivals	o Uncertain	o Uncertain
10. Industry shakeout.	- Constrained by current management system	o Uncertain. Shakeout may have already occurred.
Summary	Many reasons to expect high rivalry. However, license limitation constrains threat of new entrants; and for nonwhiting, 2-month limits minimize opportunity to compete for market share	Many reasons to expect high rivalry. However, high concentration indicates shakeout may have already occurred; and threat of intense competition may discourage strong moves to expand market shares.

Harvester Rivalry. In the shoreside nonwhiting sector, the number of harvesters is small but is large relative to processors (about 100 to 120 vessels compared to 5 to 10 processing companies of significant size). Fixed costs for harvesters may be high relative to variable costs, leading to a strong incentive to maximize the use of capital. However, for the nonwhiting fishery the two-month cumulative limits prevent this from serving as an incentive for rivalry.

Strategically, license limitation and trip limit management provide limited opportunity for direct market share competition or much industry shakeout in the nonwhiting harvester sector. Assuming that the market is capable of fully absorbing the harvest (i.e., there are no market limits), within a two-month period, no vessel can preempt the harvest opportunity of another. However, if the market is limited (e.g., a limited ability to absorb Dover sole) and if processors use limited markets as leverage by making the delivery of other products (e.g., crab) dependent on negotiations over groundfish deliveries, there may be a strategic stake in maintaining a relationship with a processor.

Competition is more intense in the whiting derby. Specialized capital with a limited market creates an exit barrier (high cost of leaving the fishery). Total capital invested in a harvesting operation is likely to be lower for harvesters than processors. However, the relative exit cost per dollar of capital (i.e., non-recoverable investment) could be higher than for processors, depending on the alternative activities available for the vessel and other assets of the fishing firm as compared to processors. Lack of unified action among harvesters during the 2007 mid-coast trawler tie-up, which occurred during the price negotiations with processors, indicates that rivalry may be strong enough to prevent coordinated action. The tie-up lasted for 43 days (70 percent of the bimonthly period), but 44 vessels were active during the tie-up, and 35 vessels were active only after the tie-up. About 55 percent of the landings were made during the last 18 days off the tie-up (Table E-5). Participation varied geographically (
Table E-6).

Table E-5. Landings and deliveries for vessels during and after the mid-coast vessel price negotiation tie-up (3/1/07 to 4/12/07).

Period	MT		Exvessel Value		Days		MT/Day	Vessels
3/1/2007 – 4/12/2007	1,194	45%	1,428,863	46%	43	70%	28	44
4/13/2007 – 4/30/2007	1,474	55%	1,699,901	54%	18	30%	82	79
Total	**2,668**		**3,128,764**		**61**		**44**	**94**

Table E-6. Number of vessels delivering and not delivering during the tie-up by port area.

Port Area	Did Not Deliver During Tie-up (3/1/2007-4/12/2007)	Delivered During Tie-up (4/13/2007-4/30/2007)
Northern Puget Sound	4	2
Coastal Washington	1	2
Columbia River	17	5
Newport	7	6
Coos Bay	6	8
Brookings	3	4
Crescent City	5	1
Eureka	5	7
Fort Bragg	2	2
Bodega Bay		1
San Francisco	1	9
Monterey		2

Processor Rivalry. The processing sector also appears to have many characteristics that would lead one to expect intense rivalry within that sector. However, one characteristic in particular indicates that rivalry would *not* be expected: a few processors handle a large share of the raw fish market. It may be that previous shakeouts in the industry have reduced rivalry. If rivalry tends to be low, price setting for raw product may still be competitive or it may be that prices are set as smaller firms follow the prices set by larger firms. While processors do not publish information on offering prices for raw product, the fishing community within a port tends to be small, and it is likely that information on offering prices is readily available by word of mouth. Additionally, the processing sector is structured in such a way that it is unlikely firms can set prices independently, even if they wanted to. For example, if one of the larger processors were to increase the price it offers for fish in order to expand its market share, other processors may also increase their prices in order to preserve their shares. If this happens, the firm that started the price increase will not have gained production but would have higher costs and lower profits. Similarly, if that processor were to cut its price, it would have to guess about what it expects its competitors would do. If it believes its competitors would not also cut the prices they offer for raw fish, then by dropping its price, it may increase profits per unit of production but lose total production. On the other hand, if other processors also drop their price, then all processors may gain. The situation in which a firm is not a monopoly but also cannot change its own price without the possibility of affecting the market prices is typically characterized as an "oligopsony." In situations like this, rivalry may be lower because the major firm must consider the responses of others to any price changes. In a fully competitive situation, other firms do not usually respond directly to one firm's price changes.

E.4.3.2 Bargaining or Negotiating Power

In the previous section, we focused on the within-sector coordination required to establish market power. Here we discuss factors affecting bargaining power between sectors. These include the following:

- Threat of substitutes
- Supplier (harvester) power
- Buyer (processor) power

Substitutes. The threat of substitutes refers to substitutes from outside the industry. An oft-used example is the substitutability of glass, metal, and plastic containers for one another. When there is a substitute available from outside the sector, the negotiating stance of the suppliers is weakened. In the raw fish market on the west coast, substitutes appear relatively limited. Processors that are vertically integrated into the wholesale chain may be able to substitute production from other geographic areas to meet customer needs and may utilize some portion of their processing capacity if they have access to "imported" raw product. However, there are not a lot of substitute activities for the profit centers represented by coastal processing facilities. It is likely that locally available resources are fully exploited and that supply facilities would be idle more of the time without trawl-caught groundfish. If processors raise prices, they also face the possibility that their customers will find substitute fish products from other geographic areas or in the form other protein products. Substitute fisheries for vessels are also limited. While vessels may move into other fisheries, they will likely have to continue to deal with the same processors if they do so in fisheries on the west coast, particularly if they stay within a restricted geographic range. If they are negotiating with a processor that is a major buyer for several west coast fisheries, substitutes that would credibly allow them to threaten to sever relations with a local processor may be limited. This situation could also pertain if a processor faced a harvesting company that is dominant in a number of fisheries.

Table E-7. Indicators of harvester bargaining power.

Indicators of Higher Supplier Bargaining power (Based on Porter)	Evaluation
Suppliers can credibly threaten forward integration (ability to buy or control processing facilities).	No (Yes, at-sea whiting)
Suppliers are reasonably safe from threat of backward integration (a processor purchasing a vessel).	No
Production is concentrated among a few suppliers.	No
Sales are spread among many processors.	No
There is a significant cost for processors to switch to a different supplier.	No
The processor's customers are powerful and willing to boycott in support of the suppliers.	No
Suppliers' products are highly differentiated from one another.	No

Supplier (Harvester) and Buyer (Processor) Power. The focus here is on relative power between the sectors.

Table E-7 provides indicators of supplier (harvester) power. Several of the factors related to rivalry within the sector have corollaries in the consideration of supplier and buyer power. For each indicator of supplier power, an inverse statement describes buyer power.[16] One of the indicators of power is the ability of each group to take on the functions of the other (forward and backward integration). Some processors have successfully integrated harvesting operations, but, while there have been attempts, there are not many examples of harvesters successfully developing processing operations at a significant level. When activity in one sector is aggregated, that sector will be more powerful, and its relative power is greater if the sector on the other side of the market is disaggregated. Buying power is higher when suppliers sell products that are not highly differentiated from those of other suppliers and when the cost to a processor of switching from one supplier firm to another is low. This statement characterizes the situation of harvesters versus processors in the west coast groundfish fishery.

The 2007 mid-coast trawler tie-up may provide another indicator of sector bargaining power. Some vessels, both processor-owned and others, did not participate in the tie-up. The tie-up ended when vessels returned to fishing to avoid losing the catch opportunity represented by an entire two-month cumulative limit period. It was anecdotally reported that there was some disruption in the local wholesale markets, with other products filling in for west coast groundfish and that, when supply returned, those markets had to be regained and the alternative supply displaced.

E.4.3.3 Barriers to Entry

If a sector is able to establish above-normal profits by overcoming rivalry, coordinating action, and exerting power in negotiations, then maintenance of that profit over the long term requires barriers to entry. Barriers to entry can be classified as follows:

1. Government created
2. Patents and proprietary knowledge
3. Asset specificity (capital malleability)
4. Economies of scale

Conclusions on barriers to entry with respect to the harvesting and processing sectors are provided in Table E-8.

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Indicators of Higher Buyer Power	Evaluation
Buyers are safe from a credible threat of forward integration by suppliers (harvesters are unlikely to acquire processing facilities).	Yes (no for at-sea)
Buyers can credibly threaten backward integration.	Yes
Supply is spread among many suppliers.	Yes
There are a few buyers with significant market share.	Yes
There is not a significant cost to switch suppliers.	Yes
Buyers purchase a significant portion of the suppliers output.	Yes
The product is standardized.	Yes

Table E-8. Summary of barriers to entry.

Barriers to Entry	Harvesters	Processors
Government Regulation	Limited number of permits but some "latent." Heavily regulated.	Fishery management related regulations less heavy than for harvesters, but also face environmental regulations (waste discharge).
Special Proprietary Knowledge	Fishing locations.	None identified.
Asset Specificity (Malleability)	Very specific (geographic relocation possible).	Very specific. Shoreside--not mobile; some utility in other sectors. At-sea—mobile.
Economies of Scale (fixed costs of attaining efficient production)	Smaller than for processors.	Larger than for harvesters.

Government Created. Government action may affect barriers to entry by directly restricting participation or indirectly imposing regulations that increase capital or operating costs. The primary direct barrier for the west coast trawl fishery is the limited entry permit requirement. This permit limits the number of harvesting vessels in the fishery and, with Amendment 15 to the groundfish FMP, restricts the movement of vessels among the shoreside nonwhiting, shoreside whiting, mothership whiting, and catcher-processor sectors. A buyback program in 2003 dramatically reduced the number of trawl permits, but, even with that reduction, some permits remain relatively inactive and presumably available for purchase or lease by someone who might want to bring a new vessel into the fishery. Both harvesters and processors operate in a highly regulated environment and face compliance costs.

Patents and Proprietary Knowledge. Control of technology and proprietary knowledge provides competitive advantage where it is not readily available to others. Knowledge of fishing grounds is an example of specialized proprietary knowledge that fishermen often seek to protect. We have not determined whether some processing firms have unique knowledge that would create a barrier for new entrants.

Asset Specificity (Capital Malleability). Both harvesters and processors utilize some highly specific assets (vessels and processing facilities, respectively). Alternative uses for a vessel generally involve switching to a different fishery. If the firm retains ownership of the vessel, switching fisheries may mean geographic relocation and the need to acquire new expertise about fishing grounds, fish behavior, and gear operation. When the alternative fisheries are under a license limitation program, permits must be purchased from other vessels. If the vessel only needs a part-time opportunity, but the prices for permits in a particular fishery are driven by their value when used full time, the permit cost may be a barrier that prevents the vessel from to switching to the alternative fishery.[17] In Chapter 3, information is provided on the degree to which trawl vessels participate in multiple fisheries. Processors also have some assets that may be specific to certain species (e.g., skinning machines) and other assets that may be more versatile (e.g., cold storage facilities) and may be used for a variety of fish species within the region, as well as for agricultural and nonagricultural products. Some processors may receive product from other geographic areas, and processors that have vertically integrated into the wholesale sector may meet their customers' needs with products from other sources.

Economies of Scale. Critical here is "minimum efficient scale." The barrier will be greater if achieving the minimum size required for cost-efficient production requires a large investment in capital, personnel, and development of organizational structure. Under circumstances where there is a very high initial cost, it may be more likely that a competitor will enter from another geographic area, related industry, or

[17] On the other hand, if the alternative fishery is under an IFQ program, the costs of the harvest rights necessary to switch into that fishery will likely be more proportional to the vessel's needs.

through vertical integration as opposed to building from the ground up. Another vehicle for initial entry would be to use a different business model, for example, relying on a higher degree of product differentiation, i.e., a company might start up by selling into a small specialty niche market and then increase scale, expanding into less differentiated fish products. Shoreside processing businesses tend to involve larger commitments of capital than harvesting operations, indicating a greater challenge for new entrants.

E.4.3.4 IFQ Program Effects on Market Power and QS Flow

The following three tables and subsequent text describe how implementation of an IFQ Program may influence the determinants of market power (rivalry, bargaining power, and barriers to entry). For each of these determinants, the tables review the same indicators covered in previous sections, evaluating how these indicators would change with the implementation of an IFQ program.

Rivalry	(Section E.4.3.1)	Table E-9
Bargaining Power	(Section E.4.3.2)	Table E-10
Barriers to Entry	(Section E.4.3.3)	Table E-11

Firms in a sector with more market power are more likely to accumulate QS up to the maximum limits; such firms will be willing and able to pay more for QS, thereby influencing the flow of QS in their direction. Horizontal integration, vertical integration, and consolidation have a primary influence on market power, and barriers to entry are necessary to maintain that power. The text following the tables explains some of the results summarized in the tables. In section E.5 we will see how these results are influenced by the initial allocation of QS.

Table E-9. Effects of IFQ program on the degree of competition and co-operation within a sector (within sector rivalry) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change).

Factor Causing Greater Rivalry	Harvesters	Processors
1. A larger number of firms with similar market shares	- A decrease in the number of active harvesting vessels and harvesting companies (subject to accumulation limits). Much of the rivalry for market share will be focused on the QS/QP market. However, for harvesters who do not own their own QS this competition may also involve rivalry in the raw fish market. - Limited opportunity for latent capacity in the sector to become more active, except through direct voluntary reductions by active vessels through QS/QP transfers.	+ Decreased geographic isolation of markets, increasing number of participants within a market. + Some pressure for consolidation in response to existing overcapitalization and threat of harvester market power. - However, if there are effective accumulation limits growth of market share for larger firms will have to occur without the advantage offered by QS ownership.
2. Slow market growth	o	o
3. High fixed costs	+ Increased fixed costs (e.g. camera systems), but for harvesters the increase influences rivalry in the QS/QP market more than the raw fish market (though if a harvester is negotiating to access QP held by a processor, the two markets could be linked). - Incentive to exert market power in the raw fish market to increase profits and recover fixed costs.	o Minor increase relative to vessels*.
4. High storage costs or highly perishable products	o	o
5. Low cost for customers to switch suppliers	o	o
6. Low levels of product differentiation	o	N/A
7. Strategic stakes are high	o	+ Increased strategic stakes, expansion requires direct displacement of competitors, more limited vertical integration opportunities.
8. High exit barriers	o	o
9. A diversity of rivals	o	o
10. Industry Shakeout.	± Expected (more stable over the long term)	± Possible (not certain)
Summary	After an initial shakeout, rivalry will decrease because of fewer harvesters and accumulation limits constraints. The need to cover fixed costs (including cameras and observers) may stimulate rivalry in the QP market and cooperation in the raw fish market. Rivalry in the raw fish market will occur to the degree that processors provide QP linked with raw fish exvessel price negotiations.	Rivalry will increase as a decrease in the geographic isolation of raw fish markets expands the number of effective participants, processors position themselves to defend against the possible exercise of harvester market power, competition for market share requires direct displacement of other processors, and accumulation limits constrain existing and potential vertical and horizontal integration.

*The IFQ program is likely to increase some processor fixed costs related to compliance with regulations, but those costs are not expected to be nearly as substantial as for vessels. To the degree that fixed costs increase, there will be an incentive for processors to increase production, thereby increasing rivalry and posing a higher barrier to new entrants.

Table E-10. Effects of IFQ program on the bargaining power of one business sector in relation to the other (bargaining power) ("-" = indicator or less power, "+" = indicator of more power, "o" = no change).

Indicators of Sector Power	Harvester (Supplier) Evaluation	Processor (Buyer) Evaluation
Threat of vertically integrating with other sector (See section on vertical integration for more detail)	+ Harvesters may vertically integrate by retaining ownership of fish while they are being processed (demanding custom processing services). + Harvesters may exert vertical influence by using QS to encourage new entry by processing concerns.	+ Increased incentive. - Threat limited by accumulation limits. - Possible reduced vertical integration for firms with strong vertical integration.
Business sector concentration (See #1 of table on "rivalry" for more detail)	+ Increased concentration. + Reduction of potential for competition through activation of latent permits.	- Decreased geographic isolation of markets (QP liquidity). + Pressure for consolidation/integration. - Consolidation/integration constrained by accumulation limits.
Switching Costs (processor to a different supplier or supplier to a different processor)	o	O
Processor customer power	O	N/A
Harvester products are highly differentiated from one another	O	O

Table E-11. Effects of IFQ program on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change).

Changes to Barriers to Entry	Harvesters	Processors
Government Regulation	+ Increased fixed costs. + Absolute barrier to entry and expansion	+ Increased fixed costs. Relatively minor compared to harvesters.
Special Proprietary Knowledge	O	O
Asset Specificity (Malleability)	O	O
Economies of Scale (fixed costs of attaining efficient production)	+ The cost of achieving any given level of scale will be increased by the need to acquire QS.	+ If processors in the industry acquire QS, the cost to new entrants to reach a similar level of scale, efficiency, and risk control will be increased by the need to purchase QS. Accumulation limits create absolute barrier in ability to protect higher production levels through ownership of IFQ.

Harvesters. Regardless of who is given the QS, implementation of an IFQ program will result in a shakeout in the harvester sector, leading to consolidation of harvest among vessels in the long term. If most of the harvest were also concentrated among a few of the remaining harvesters, rivalry would be further reduced; however, accumulation limits would be expected to limit concentration. While rivalry may be reduced, the IFQ system is not, itself, one in which intense rivalry among harvesters who acquire QS would be expected. To expand their market share, harvesters would have to compete in two markets: (1) the QS/QP market, to gain the needed access rights; and (2) the raw fish market.[18] Once a harvester secures QS/QP, the need to compete with other harvesters for a share of the raw fish market may be minimal (i.e., it is expected that, in general, the trawl groundfish allocation will be fully utilized—that markets will exist or be developed for all of the reasonably marketable catch).[19] Moreover, since harvesters' ability to expand revenue through increased harvest will be limited by their QS/QP holdings, there is a strong incentive for them to cooperate in raw fish price negotiations with processors as a main means of increasing their revenue for the catch for which they have QS/QP. However, the degree of direct competition and rivalry among harvesters for shares of the raw fish market will depend on the long-

[18] The need to gain access rights in the form of QS/QP and the effects on the market are closely related to the creation of a barrier to entry, discussed in the following paragraph.

[19] For some species, such as Dover sole, supply may exceed demand at prices that harvesters are willing to make a delivery.

term distribution of QS among harvesters and processors. Some harvesters may not acquire all the QS they need for their optimal production levels. If some QP are available from processors (e.g., those processors not using the QP holdings from their own vessels), the negotiations over QP and raw fish prices may be linked.

Under the IFQ program, there is not likely to be latent license capacity for a processor to threaten to draw on if negotiations fail. This affects rivalry among harvesters, bargaining power, and entry barriers. Under status quo, by using a latent permit, a new harvester might come online without directly taking fish deliveries away from another harvester.[20] The need to hold QS/QP forms an absolute barrier to entry, and new entry can only occur to the degree that the production of an existing participant is first removed through the acquisition of QS/QP. While the barrier to activation of latent capacity may increase the opportunity for a harvester with its own QS to exert power, harvesters may still have to be concerned about linkages between their harvest of groundfish and deliveries from other fisheries (e.g., Dungeness crab).

Fixed costs affect both rivalry and barriers to entry; here we will discuss harvester rivalry. Categorization of fixed costs depends on the time frame of reference. For example, costs may be fixed for a year, a trip, or a day of a trip. An increase in fixed costs, particularly those related to compliance and costs that are fixed per day of fishing, such as observer costs, would be expected to increase rivalry in the QS/QP market but increase cooperation in the raw fish market. [21,22] Increased fixed costs will likely lead vessels to seek to expand their production per trip, requiring more QS/QP. However, if there is a willing buyer for any QS/QP acquired (i.e., vessels need not compete for a market for their raw fish), the increased fixed costs would give vessels a greater incentive to coordinate marketing in the raw fish market in the hopes of generating higher profits to recover increased fixed costs.

Harvester market power may also increase with an increased opportunity to exert vertical control through (1) retaining ownership of fish and hiring custom processors, and (2) acquiring QS and using those QS to encourage new processors to enter the west coast market by guaranteeing raw fish deliveries. Custom processing has been seen in the IFQ system in British Columbia. [23] This initial increase in vertical control through custom processing could allow vessels to develop some of the marketing expertise, which might then put them in a better position to more completely step into vertical integration by taking on direct ownership of processing facilities. If harvesters encourage entry of a new processor, that processor would still have to compete with existing processors in the wholesale market, but their risk could be substantially reduced if harvesters with QS are willing to make long-term commitments.

With respect to entry barriers, there will likely be certain government required compliance costs, e.g., camera systems, that will raise the cost of entry. Harvesters wishing to achieve efficiencies related to any particular scale of production will also have to purchase an amount of QS commensurate with that scale of production (the effect of the initial allocation in this regard will be discussed in Section E.5).

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[20] While the two-month landing limits mutes some rivalry, under status quo, if a licensed vessel holds out during negotiations, a buyer may be able to find another licensed vessel to make that delivery, activating a latent permit if necessary (there are a number of permits available that are not used or not used to their full capacity).

[21] The cost of the QS/QP itself does not represent a fixed cost because they can be sold (the QP in particular) during the season.

[22] With consolidation of production among fewer vessels, it is likely that some of the existing permits will go unused and may be available for purchase by new entrants (reducing the cost of entry with respect to permit price). However, the higher the fixed compliance costs for participating in the program, the more QS/QP a new entrant will need to buy to achieve the level of efficiency necessary to pay the cost of the QS/QP. The fixed costs and need to purchase QS/QP will result in a net increase in the cost of entry (barrier to entry).

[23] Under a custom processing arrangement, vessels retain ownership of the fish, which is processed for them under contract. The harvesters then sell the fish into the wholesale or retail market. In this way, harvesters begin vertical integration and the capture of some rents from other parts of the production chain.

Processors. With an IFQ program, rivalry would be expected to increase among processors for a number of reasons (note: this portion of the analysis does consider the effect of the initial allocation).

First, processor rivalry may be increased by a decrease in the geographic isolation of markets that effectively raises the number of participants. In the discussion box below, a hypothetical construct is provided to explain how the liquidity of QP may link markets that had been previously geographically isolated, thereby expanding the number of participants. Table E-13 through Table E-16 provide information on processors that operate in multiple ports and the size of processors in each port as measured by their average metric tons for 2004 to 2006 for the whiting and nonwhiting fisheries.

Second, the potential for increase in harvester market power will encourage processing firms to integrate horizontally and vertically. With respect to vertical integration, acquisition of QS could provide a lower-cost means for processors to (1) compete with one another for market share (foreclosing competitors' access to supply and consolidating processors' market shares), (2) vertically integrate to secure supply,[24] and (3) hold out during negotiations. However, while there may be more incentive for horizontal integration and consolidation, actual integration may be limited by accumulation limits.[25]

Finally, rivalry may also increase due to direct strategic conflict. Direct strategic conflict would be associated with the foreclosure effect caused by any firm that tries to expand operations, the effects of accumulation limits on current industry structure, and a firm's ability to integrate horizontally and vertically. With respect to the foreclosure effect, under status quo, a processor can expand its operations by acquiring access to an unused or underutilized limited entry permit and vessel. Other processors are displaced indirectly as managers reduce vessel two-month cumulative limits in response to the increased effort, and processors compete with one another to sell their products in the wholesale market. Under IFQs, competition will be direct. A processor can secure more product only if the raw product going to a competitor is directly and immediately reduced (i.e., acquisition of QP or harvester delivery commitments directly reduce a competitor's market share by foreclosing its access to supply of a key input). Accumulation limits will alter the existing and potential horizontal and vertical integration, possibly shifting power balances within the sector and leading to strategic repositioning. Fish buyers at their QS accumulation limits who are vying to maintain or increase production will have to compete with one another for the production of existing vessels with less latitude in the means available for securing harvest commitments. They would not be able to offer their own QS/QP to cover additional harvester (see paragraph below on the limits to vertical integration).[26]

[24] Facilitating planning for more efficient production.

[25] In its final preferred alternative, the Council applied accumulation limits on control limits only to QS; this substantially reduced the constraint that the control limits would have imposed on vertical integration by processors and horizontal integration by harvesters. Under the final preferred alternative, such integration can occur limited only by antitrust laws and the ability of the firm to acquire QP each year from other QS owners.

[26] The situation under IFQs and status quo would be similar for vessels that max out their two-month limits with deliveries to a particular buyer. One buyer can bid production away from those vessels only at the cost of a direct reduction in raw product delivered to another buyer.

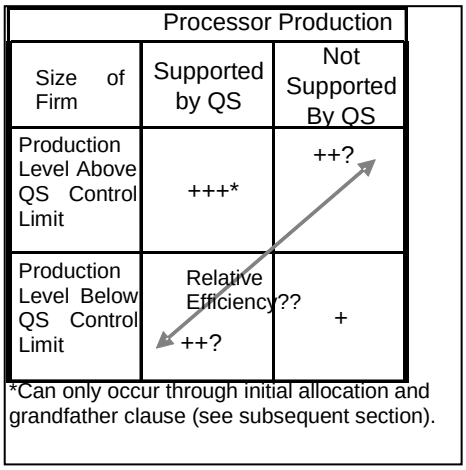

Figure E-10. Relative efficiency (including risk factors) based on size of firm and whether production is supported by QS.

For processors that are at their control accumulation limits, horizontal integration could occur only through the acquisition of firms that do not control QS, and expansion (consolidation) can occur only through increasing the proportion of production unsupported by processor-owned QS. When at the control limit, a processor that expands production decreases the portion of its production supported by QS controlled by the processor (such a processor would be increasing the amount of its QS in the upper right hand cell of Figure E-10). At the same time, processors that are not at their limits may acquire additional firms that own QS or support expanded production by securing additional QS (expand activity in the lower left hand cell of Figure E-10). Therefore, unless firms at their QS accumulation limits have other advantages (e.g., are already more efficient than firms that are below their accumulation limits, gain enough efficiency through expansion to compensate for the costs and risks of production unsupported by QS, or have better access to capital), firms that are below their accumulation limits may gain more advantage through consolidation (growth). However, with respect to consolidation, firms with no QS may be less expensive to acquire than those with QS, making them more likely candidates for acquisition by firms at their accumulation limits that wish to extend their horizontal integration. Processors at accumulation limits will be more likely to expand if, for them, the relative efficiency of an additional increment of production not supported by QS is greater than the same increment of additional production by a firm operating at a lower level of overall production, but with support of its own QS (the upper right-hand cell of Figure E-10 is *greater* than the lower left-hand cell). On the other hand, if the relative profitability is the opposite, it will be more likely that smaller firms will acquire QS and expand up to accumulation limits (the upper right-hand cell of Figure E-10 is *less* than the lower left-hand cell). Section A-2.2.3-e provides data on the number of fish-buying firms that would be expected to be above and below accumulation limits under various allocation formulas.

Processors at their accumulation limits may not be able to further integrate vertically through acquisition of harvesting vessels. If control limits apply to both QS and QP, a processor at its control limit that decided to vertically integrate by purchasing a groundfish trawl vessel would not be able to acquire additional QP to place on the vessel.[25] The definition of control will also be important in determining the nature of harvester-processor relations. For example, if exclusive contracts for delivery are considered "control," then processors at their limits may not be able to enter into this type of contract with a harvester. At the same time, it would be less expensive for processors not at the control caps to vertically integrate though acquisition of QS (as compared to integration by acquisition of a vessel), increasing the viability of a threat by the processors to integrate vertically. However, it is more likely to be the smaller processors that will not be at their accumulation limits, and they may not control enough of the processing capacity to exert much market power.

While processor rivalry may increase for the reasons described above, some of the same factors will decrease bargaining power, specifically the decrease in the threat for backward integration due to the effect of accumulation limits and the expanded geographic scope of the market due to the liquidity of QP and interaction between the QP and raw fish markets. At the same time, the threat of the potential for harvesters to exert market power will provide incentive for increased cohesion among processors. However, processors' ability to act together is very limited because of antitrust law constraints. Harvesters, on the other hand, are able to coordinate their marketing under provisions of the Fishermen's Collective Marketing Act.

Those processors that own QS may be more competitive than those that do not (depending on acquisition costs); therefore, the possible need for new entrants to acquire some QS to be competitive may add to the cost of entry, creating a barrier to entry. Differences in processor profit opportunities before and after implementation of the IFQ program may also create a short-term barrier. If existing processors have some market power before implementation of IFQs, and that market power still exists, but at a diminished level after IFQ implementation, new entrants will be at a disadvantage in their ability to recover their investment compared with those who may have recovered their investments at a time of relatively greater profit.

The above paragraphs deal with conditions that would encourage or discourage the exertion of market power among processors. In this context, if the raw fish market is competitive before and after implementation of IFQs, and the processing sector is overcapitalized because of recent declines in OY or the race for fish in the whiting sector, that sector may bid away some of the profits associated with capital investment to secure access to harvest and QS. Also, if processors currently have market power in the raw fish market, but do not after IFQs are implemented, they will also be likely to bid away some of their profits. In both cases, a new entrant will face the situation of attempting to recover capital investment in an environment in which existing firms are not making enough profit to cover their capital costs. While this situation may present a temporary barrier to entry during a period of processor rationalization, it is not relevant to the market power evaluation, since there would be no market power for an entry barrier to preserve.

Box: Decreasing the Geographic Isolation of Local Raw Fish Markets

Consideration of the factors influencing market power requires careful definition of the scope of the market and assessment of whether that scope changes with the implementation of an IFQ program. In the market for raw fish, part of a processor's ability to exert market power may be based on transaction costs that imply less than perfect mobility in harvesting operations. The cost of moving harvesting and raw fish marketing activities between geographic areas or from one owner to another reduces mobility, or in some sense, creates "stickiness" in the system. This stickiness determines the scope of the individual markets. There may be numerous processors coast wide, but if there is only one or a very limited number of processors in a particular port, under status quo, the processors in that port may have more bargaining power than if they compete on a coast wide basis. While they have some latitude to offer lower prices within a port, that latitude may be limited if there is a processor in another port willing to offer a higher price. In such a case, if the processor in the vessel's preferred port offers a price that is lower than the price available in an alternative port by an amount greater than the cost of delivering to the alternative port, the preferred port processor might lose that delivery.* In aggregate, if one processor operates in many ports coast wide, coordinating prices between its plants, and if that sector operates similar to other sectors with a single dominant player (with smaller processors following the prices of the larger processors), then the opportunity for a vessel to find a higher price elsewhere along the coast may be limited.

The introduction of QP changes the situation by reducing the cost of moving production between ports, thereby reducing stickiness. QP may move from one port to another at relatively low cost. Consider a hypothetical status quo situation In which there are five ports (yellow, red, blue, white, and orange [in north to south order]), and there are processors in each port. Within each port, there are only a few processors, and the costs of moving fish between ports isolates the local market and provides the processors in each port with some latitude to follow price setting by the dominant processor in that port. If the dominant processor in each port is processor A, then prices may be coordinated among the somewhat separated markets. Now consider a QP market. Since QP can move easily between ports, there may be really a single market for QP along a major section of the coast. Now if Processor A wants to offer a lower price for vessels delivering fish in say, Port Orange, vessels can consider transferring QP to a willing buyer in any one of the other ports without catching the fish themselves. With respect to relations with a particular vessel in Port Orange, Processor A has to contend not only with Processor F and possibly D, but also with Processors C, B, and E. If one of those processors is willing to offer a higher exvessel price for the fish, the QP can easily be transferred to the alternative port, with the vessel in Port Orange receiving the higher profits associated with the QP.

Table E-12. Hypothetical markets for raw fish and quota pounds.

Raw Fish				Quota Pounds	
Market	**Processors**			**Market**	**Processors**
Port Yellow	A B C			Coast wide or Regional (e.g., north of 40 10)	A B C D E F
Port Red	A				
Port Blue	A B E				
Port White	A D				
Port Orange	A F				

Whether the price-setting situation hypothesized here exists and whether the additional mobility provided by QP is enough to break down such price setting are open for discussion. If processors are able to exert market power, they will be in a stronger position to buy QS up to accumulation limits or negotiate strong contracts for delivery of QS fish.

There are some limits to QP mobility that influence the result and have to be considered:

(1) There will be some transaction costs associated with the QP transfers (even if much lower than for the movement of the vessels or fish).

(2) There may be non-pecuniary benefits to fishing (lifestyle benefits associated with the fishing activity that are not financially rewarded) such that a fisherman will have some additional tolerance to fishing at a profit lower than what he might receive by not fishing and selling the QP in an alternative market (i.e., a fishermen might be willing to give up some of his quasi-rents).

(3) If this transfer of QP went on for a period, and if the vessel owner were not able to cover its fixed costs through other fishing activities, over time, the vessel owner would reduce the size of its capital investment (the vessel owner would likely sell the vessel).

Table E-13 through Table E-16 provide information on processors that operate in multiple ports and the size of processors in each port as measured by their average metric tons for 2004 to 2006 for the whiting and nonwhiting fisheries.

*Other factors would also come into play such as negotiations over the suite of raw product a vessel might want to deliver to its preferred port on a year-round basis.

Table E-13. Trawl non-whiting groundfish buyers active in multiple ports (A = active buyer in the port) and single ports (count of single port buyers in each port), and distribution their buying activities among ports (based on 2004 to 2006 fish tickets).

	Non-whiting Buyer Category*																
	Buyers Active in Multiple Ports and Ports In Which They Were Active													Number of Buyers Active in a Single Port		SubTotal	Total Buyers
Port	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	>10,0000 lbs	<10,0000 lbs	>10,0000 lbs	
Neah Bay						A								2		3	3
Blaine									A					1		2	2
Bellingham						A			A					1		3	3
West Port	A														2	1	3
Ilwaco														1		1	1
Astoria	A					A									3	2	5
Tillamook	A														2	1	3
Newport	A				A										4	2	6
Florence														1		1	1
Coos Bay	A	A			A									1	4	4	8
Brookings	A	A			A										1	3	4
Crescent City	A						A								2	2	4
Eureka	A		A													2	2
Fort Bragg	A	A	A												1	3	4
Bodega Bay	A	A	A		A											4	4
San Francisco	A		A	A			A				A	A			2	6	8
Oakland		A														1	1
Princeton		A	A											3	5	5	10
Santa Cruz															3	0	3
Monterey												A	A	1	1	3	4
Moss Landing		A		A				A			A		A	1	4	6	10
Morro Bay				A			A	A		A				1	6	5	11
Avila				A												1	1
Santa Barbara										A						1	1
Total	**11**	**7**	**5**	**4**	**4**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**13 Buyers**	**40 Buyers**	**62**	**102**

* The 10,000-pound threshold is an average per year.

Table E-14. Number of non-whiting buyers by average level of landings received during 2004 to 2006.

Port	<10,000 lbs	10,0000 - 20,000 lbs	20,000 - 100,000 lbs	100,000 lbs - 100 mt	100 mt - 500 mt	500 - 1,000 mt	>1,000 mt	Subtotal >100,000 pounds	TOTAL
Neah Bay		1	1		1			1	**3**
Blaine			1			1		1	**2**
Bellingham			2				1	1	**3**
West Port	2				1			1	**3**
Astoria/Ilwaco	3		1				2	2	**6**
Tillamook	2		1					0	**3**
Newport	4				1		1	2	**6**
Florence/ Coos Bay	5	1		1			2	3	**9**
Brookings	1	1		1		1		2	**4**
Crescent City	2			1	1			2	**4**
Eureka					1		1	2	**2**
Fort Bragg	1		1		1	1		2	**4**
Bodega Bay	3		1					0	**4**
San Francisco Bay & Princeton	10	1	4	1	3			4	**19**
Santa Cruz	3							0	**3**
Monterey	2		1		1			1	**4**
Moss Landing	4	1	1	3	1			4	**10**
Morro Bay/Avila & Santa Barbara	8	2		1	2			3	**13**
TOTAL	**50**	**7**	**14**	**8**	**13**	**3**	**7**	**31**	**102**

Table E-15. Trawl shorebased whiting buyers active in multiple ports (A = active buyer in the port) and single ports (count of single port buyers in each port), and distribution of their buying activities among ports (2004 to 2006).

Port	Whiting Buyer Category*			
	Buyers Active in Multiple Ports and Ports In Which They Were Active		Buyers Active in a Single Port	Total Buyers
	B1	B2		
West Port			1	**1**
Ilwaco			1	**1**
Astoria	A	A	2	**4**
Newport	A		2	**3**
Coos Bay	A		2	**3**
Crescent City			2	**2**
Eureka	A		1	**2**
Moss Landing		A		**1**
Totals	**4**	**2**	**9 Buyers**	**17**

Table E-16. Number of whiting buyers by average level of landings received during 2004 to 2006.

Port	<100,000 lbs	100,000 lbs – 1,000 mt	>1,000 - mt	**TOTAL**
West Port			1	**1**
Ilwaco			1	**1**
Astoria		3	1	**4**
Newport			3	**3**
Coos Bay	1	1	1	**3**
Crescent City		2		**2**
Eureka	1		1	**2**
Moss Landing	1			**1**
Totals	**3**	**6**	**8**	**17**

E.4.4 Access to Capital (Demand) - Discount Rates

The purchase of QS requires access to financial capital. Such purchases may occur by using wealth that a firm or individual already holds or through commitment of future earnings in return for access to capital held by someone else (e.g., commitment of future payments in return for a loan from the bank). The focus of this section is on factors that affect how much individuals and businesses are willing to pay for access to capital (demand) and how that affects their access to QS. The focus of the following section is on factors that affect how much lenders are willing to supply capital and how that affects the ability of individuals and businesses to get loans for the purchase of QS.

All else being equal, QS will flow toward people or businesses that have a low personal discount rate (Francis et al. 217-33). [Note: personal discount rates are related but different from market interest rates that must be paid to borrow. Interest rates will be discussed in a following section.] Discount rates play a major role in determining how much an individual is willing to pay for QS. The value of QS to the individual represents the expected stream of income from QP issued for that QS, discounted based on preferences between future and present income. People or businesses that have a strong preference for earnings in the current year as opposed to future years are said to have high discount rates.

Here we will first discuss discount rates in general and then discuss factors affecting discount rates, including the following:

- Time preference
- Risk

To illustrate the effect of differential discount rates of QS values, consider a person who places a relatively high value on current consumption as compared to next year's consumption, say a 25 percent discount rate. That person would prefer to receive $80 this year rather than waiting and receiving something less than $100 next year ($80 + (25 percent x $80)) but would give up $80 this year in order to gain something more than $100 next year. To illustrate the effect of differences in discount rates, consider an amount of QS that is expected to generate $100 of net revenue each year. To simplify this illustration, we will limit the duration of time considered to five years. Now assume there are individuals with discount rates of 5, 10, and 20 percent. Table E-17 shows how much these individuals would be willing to pay for the QP in each subsequent year and in total, assuming that they had to buy QP for all five years up front. As can be seen, a person with a discount rate of 5 percent would be willing to pay $452 now for the QS compared to $269 that a person with a 20 percent discount rate would be willing to pay for that same QS (i.e., the person with the lower discount is willing to pay 68 percent more).

Table E-17. Example of the effect of personal discount rate on willingness to pay for a five-year stream of revenue.

		Year					Present Value
	Personal Discount Rate	**1**	**2**	**3**	**4**	**5**	**(5 years summed)**
		Values by Year($)					
	Nominal Values	**100**	**100**	**100**	**100**	**100**	**500**
Person A	Values Discounted at 5%	100	95	90	86	81	452
Person B	10%	100	86	73	63	53	375
Person C	20%	100	68	47	32	22	269

People with lower discount rates are likely to pay more for QS even if they expect to derive similar revenue. The following sections discuss factors affecting personal discount rates.

Literature based on IFQ trading shows fishermen have fairly high discount rates (Asche 403-10). Table E-18 displays the relationship between the ratio of QS value and QP value and the implied discount rate.

Table E-18. Discount rate associated with different relationships between quota value and QP value (adapted from Asche, 2001).

QS/QP Value	**3/1**	**4/1**	**5/1**	**6/1**	**10/1**	**11/1**	**15/1**
Discount Rate	0.50	0.33	0.25	0.20	0.11	0.10	0.07

In the mid 1990s, ratios reported for the Iceland IFQ system varied from 3.5/1 to 9.2/1 depending on the species. This would place discount rates between 11 and 50 percent. These rates would be determined by those able to participate in the market. In Iceland, the system is designed to discourage absentee ownership of ITQ (ownership by those who do not participate as harvesters). Therefore, the rates may better reflect time preferences of fishermen. If members of other sectors of the fishing industry or the broader economy also participated in the market, the ratios might be different. We will now look at some factors that influence the general discount rate.

E.4.4.1 Personal Time Preferences

We are using the term "time preference" here to reference personal time preferences unrelated to risk and other factors that influence discount rates. Factors affecting time preference include income, wealth, innate patience, and education (Becker and Mulligan 729-58).[27] Individuals with low income will often have higher time preferences (value current consumption over future consumption) due to a greater desire to meet immediate needs. Research on fishermen time preferences is available but limited. When asked to respond to hypothetical profit decreases and increases for a series of years, fishermen in the north Irish Sea answered in ways that indicated a range of time preferences that were fairly high (Curtis 775-78). Thirty-seven percent of all fishermen had discount rates of greater than 50 percent, and 40 percent had discount rates of between 30 percent and 50 percent. It seems likely that crewmembers will be less wealthy than business owners and, therefore, more likely to discount future earnings and less likely to acquire QS. Level of expected future income also affects time preference (if one expects income to rise in the future, one may have a higher preference for current consumption). Similar to an individual, managers of a business under financial stress may place a higher value on current income that is needed to survive, compared to the value that a healthier business might place on current relative to future income. Simple patience is another personal characteristic affecting time preference. While QS is more likely to flow in the direction of those with lower time preferences, the IFQ system itself, independent of the initial allocation, is not expected to directly affect personal time preferences.

E.4.4.2 Risk

The aspect of risk of concern here is a person's assessment of future risk. Considerations include ability to enjoy/utilize future income and personal assessment of the likelihood that future earnings will be realized. Those who face greater risk in their activities or otherwise believe the future is riskier will discount QS and be less likely to buy than those who see more certainty, unless the acquisition of QS overcomes that risk. The IFQ program will create an opportunity for individuals (e.g., crew), businesses, or other entities (e.g., communities) to increase the security of their income by acquiring QS to ensure access to harvest. A QS owner may earn income from the sale or direct use of the QP associated with the QS, or use it as leverage to ensure access to employment or other economic activity (e.g., a community ensuring the continuation of fishing activity in its port). This is closely related to risk reduction through vertical integration, discussed in a previous section (page E-13). Assessments of the degree to which ownership of QS might increase security will also involve consideration of the likelihood that there will be changes to the program or changes in the fishery resource. Other factors affecting risk under IFQs are discussed in Chapter 4. These include a harvesting firm's assessment of the risk that it will encounter a disaster tow for limiting overfished species or that another vessel will encounter such a tow and cause portions of the trawl IFQ fishery to be closed, even though some QP have not been harvested.[28]

E.4.5 Access to Capital (Demand) – Planning Horizon and Investment Recovery

Another factor determining the value a person will place on QS is the length of time over which the person will value the asset. A person with a shorter planning horizon may tend to place a lower value on QS; however, future resource rents can be captured by the firm at any time through the sale of the QS (assuming competitive sectors). Therefore, in order for the planning time horizons to make a difference,

[27] Note: Individuals who expect to have higher incomes in the future or have less utility for income in the future (e.g., the anticipation of a more limited ability to enjoy the income) will also have higher discount rates than those without such expectations.

[28] Another aspect of risk is simply the risk a person attributes to the possibility that they will not be around or will have less ability to enjoy the income in the future than they do in the present.

the firm must be earning some rents that are not reflected in the QS value (representing resource rents) or place some additional value on the QS that will not be captured in sale of the QS.

To illustrate, assume that the following:

- There are two individuals who each have a discount rate of 5 percent (person A in the previous example).
- They both own QS and earn resource rents (the difference between P1 and P2 in Table E-19**Error! Reference source not found.**).
- They are equally efficient and earning intramarginal rents (see Section E.4.3).
- The $100 value that they anticipate earning each year is derived from owning the QS (rents) *and* participating in the fishery (intramarginal rents).

When they leave the fishery, they will be able to sell their QS and capture future resource rents. However, they will no longer capture the intramarginal rent. If we assume the intramarginal rents are $20, that the general market price for the QP is $80, and that a person plans on leaving the business after three years,[29] that person would value the QS at only $419 as compared to $452 for someone who plans to remain in the fishery for all five years (the actual time horizons over which QS is valued are likely longer; the five-year horizon is being used to illustrate the concept).

Table E-19. Example of the effect of planning horizon on willingness to pay for a f-year stream of revenue (both cases assume that QS are sold at the end of the five-year period, but that Person A-2's intramarginal rents are based on exceptional fishing skill and will not be captured upon sale of the business).

		Year					Present Value
	Personal Discount Rate	1	2	3	4	5	(5 years summed)
		Values by Year($)					
Person A-1	Nominal Value	100	100	100	100	100	500
	Discounted Values at 5%	100	95	90	86	81	452
Person A-2	Nominal Value	100	100	100	80	80	$460
	Discounted Values at 5%	100	86	73	69	65	419

In this example, we have considered a planned exit. Other factors may also affect planning horizons, for example, the amount of time required to recover the cost of a capital investment. If one of the reasons a firm holds QS is to increase its security in recovering on a capital investment, the longer it takes to recover on that capital investment, the longer the stream of benefits the firm will necessarily take into account and the more it may be willing to pay for the revenue security the QS provides, as compared to other firms with a shorter time horizon.

E.4.6 Access to Capital (Supply)

The main concern here is what it costs to borrow money (access to capital) for the purchase of QS. These costs are generally reflected in the interest rates charged by lending institutions. Risk, at the industry and borrower level, is major determinant of willingness to lend. At the industry level, an IFQ program is expected to reduce risk by stabilizing the industry economically, allowing for better long-term planning, and improving stock conservation through improved information and more precise control over total

[29] Also assumed here is that the source of the person's intramarginal profits is such that he/she will not be able to capitalize on those profits through sale of the business (receive a price for the firm that takes into account the firm's greater efficiency relative to other firms). An example of this would be if the individual leaving the industry is also the vessel operator and the source of his/her rents is superior skill.

removals. The IFQ program may also increase the potential for harvesters to exert market power (or decrease the effectiveness of processor market power), thereby increasing the risk that processor profits may decline. Therefore, all else being equal, the cost of capital for processors could increase.

At the individual firm level, some of the factors that affect willingness to lend are the borrower's equity (including the liquidity of that equity), size, diversification, and viability of the business plan. The nature of a firm's equity determines the firm's ability to offer up collateral as security for a loan. When a loan is sought for the purchase of an asset, the asset itself sometimes serves as security for the loan (e.g., borrowing for a real estate purchase). Our primary concern here is a firm's access to capital under an IFQ program and how that affects QS flow. Access to capital is necessary for the purchase of QS. If a firm does not already have the capital, it will have to borrow money if it wants to purchase QS. To secure a loan to purchase QS, the QS itself may be of limited use as collateral because the value of the QS may fluctuate with changing stock conditions, prices, and regulations (including increases in costs caused by regulations and possible changes to the QS system). In deciding whether to lend for the purchase of QS, , a lender is more likely to evaluate the loan applicant's overall financial condition, including total equity and its liquidity, because the value of the QS may be somewhat tenuous. A firm without QS or with insufficient QS to support its business plan will be viewed as a higher risk.[30] Thus, QS may be of limited value as security for the loan itself, but ownership of QS may reduce the firm's risk profile, giving it cheaper access to capital secured by other assets.[31]

Table E-20. Influences of the IFQ program on QS flow through effect on demand and supply of capital.

	Harvesters	**Processors**	**Crew**	**Communities**
Demand for Capital				
Time Preference	Those with high time preference will not be willing to pay as much for QS.			
	Indication of high time preferences.	Uncertain	Low income may lead to high time preference.	Uncertain
Risk	Those who believe that the future holds greater risk than others will have a lower willingness to borrow, unless ownership of QS overcomes the risk. The fishery managed with IFQs will have inherently less risk. There is no basis to distinguish among groups.			
Planning Horizon and Investment Recovery	Those who have a longer planning horizon for the use of an asset may be willing to pay more to acquire it (as compared to someone acquiring the same asset with a shorter horizon). (This outcome depends on there being a limited ability to recover future earnings through sale of the asset at the end of the planning horizon.) There is no basis to distinguish among groups.			
Supply of Capital	The overall financial position of a firm will be evaluated in determining loan worthiness. Firms are likely to receive more favorable terms for a loan if they are larger, diversified, and have assets that may be used as security and are of value outside the industry. In general, the IFQ program will likely decrease risk in the industry. QS are of tenuous value as collateral, but are important to the viability of a firms business plan. Firms with cheaper access to capital will be more likely to accumulate QS.			
	Harvesters less likely to have capital useful in other industries. Of generally smaller total size than processors. Risk and cost of accessing capital may decrease with greater stability and possible increase in market power.	Firms more likely to have capital that may be useful in other industries Firms often of larger size than harvesting firms. Processors may experience a risk increase associated with harvester market power, increasing the cost of accessing capital.	Not likely to have fishing business related assets for use as collateral. This may mean higher costs of borrowing.	May have cheaper access if the governing body is viewed as lower risk.

[30] Not receiving a sufficient allocation in itself would raise a question in the lender's mind as to the status of the firm in the industry and viability of its business plan.

[31] Anonymous interviews with bank lenders and industry analysts. March 2008.

In evaluating the liquidity of a firm's assets, one of the factors that banks consider for the fishing industry is whether an asset can be used outside the industry (is malleable to other uses). In general, harvesting firms tend to have fewer assets usable outside the fishing business, relative to processing firms. Harvesting firms generally have a vessel and vessel-related assets (gear) and may have some shorebased equipment (e.g., a truck). Processing companies may own a number of assets that are not industry specific, potentially including land, buildings, cold storage, heavy equipment (e.g., lift trucks), trucks, and cars. [Note: Some companies may lease some of these assets (e.g., land and buildings in a port).]

Size and diversification of the firm are other factors considered in evaluating risk. Processing companies tend to require greater capital investment than harvesting companies. Their business operations may also be more diversified in that some assets may be used temporarily in non-fish industry employment (e.g., cold storage), and they may satisfy customer needs and to some extent utilize processing capacity with product from outside the geographic region. On the other hand, vessels are more mobile and so have some opportunity for diversification through geographic relocation.

E.5 Summary of Influences on the Flow of IFQ among Groups and Effect of Initial Allocation of QS

The following is a summary of the general way in which the flow of QS is influenced by the initial allocation for each of the above topics.

- **Relative efficiency**. Initial allocation will provide an infusion of capital. Those receiving an initial allocation will have an opportunity to make investments to increase their efficiency over competitors. Greater profits will then enhance their ability to accumulate more QS up to accumulation limits.
- **Vertical Integration**. Under IFQs, there will be an increased incentive for vertical integration. Those receiving an initial allocation will experience an increase in resources to support vertical integration (for processors, vertical integration includes the acquisition of QS). If there is a grandfather clause, initial allocations may lock in certain efficiency advantages among firms, until the grandfather clause expires. However, to the degree that control accumulation limits are effective, this differential will not allow the firms at their accumulation limit to acquire more QS; moreover, processing firms with higher levels of vertical integration may have to divest themselves of some harvesting opportunities.
- **Market Power**. An increase in market power among those receiving an initial allocation will increase their profits and ability to acquire additional QS. The initial allocation will affect within-sector rivalry, bargaining power, and barriers to entry.
- **Access to Capital**. Those receiving an initial allocation will have enhanced access to capital, which, in turn, will allow them to accumulate QS more rapidly. An initial allocation may increase the recipients' demand for capital, and it may be less expensive for them to acquire capital (lower borrowing costs) and thereby QS. Harvesters not receiving enough initial allocation may be viewed as high risk if they go to borrow.

The following text and tables (Tables E-21 and E-22) review these results in more detail, discussing some of the differences between sectors. Where there are a number of contingencies that will determine the expected outcome, key questions are provided to help the reader develop their own assessment of expected outcomes. A final summary table provides an overview of differences in the outcomes for harvesters and processors.

E.5.1 Relative Efficiency

For initial recipients, the initial QS allocation will give them an ongoing advantage over those who did not receive an initial allocation. The initial allocation constitutes a "free" infusion of capital and all else being equal, the firm receiving that infusion will experience greater opportunity to increase efficiency compared to firms not receiving an initial allocation. For example, assume there are two firms with similar relative costs and revenues, but the first receives an initial allocation of QS, and the second does not. If industry profitability allows the second firm to purchase QS with the expectation of being able to recover its investment in the QS, then it is implied that the firm receiving the initial allocation of QS will have a similar opportunity to make a capital investment and either expand its operations through the acquisition of yet more QS, or make other acquisitions to enhance its business activities. If this investment further advances that firm's efficiency, it will then have a competitive advantage in the acquisition of even more QS or in other areas of competition. In this way, the initial allocation may create a self-perpetuating and potentially expanding difference between firms receiving and not receiving the allocation.

Table E-21. Influences of status quo, IFQ program, and initial allocation relative to efficiency on profit distribution and QS flow (shaded cells repeats information in previous sections).

	Harvesters	Processors
Status Quo	At a competitive equilibrium, both sectors would be expected to have comparable profit levels. Because a full competitive equilibrium is never reached, in every sector, some firms are more profitable than others, and one sector as a whole may have greater profits than the other. Changes in the fishery may affect profits for firms in each sector differently. For example, the effect of the contraction of the fishery in the last decade may have affected harvesting and processing firms to different degrees.	
IFQ Program	IFQs are another change that is expected to affect the sectors differently. If one sector gains more efficiency than the other, all else being equal, we would expect that QS would initially flow toward the sector that has a greater efficiency gain. In the short term, the IFQ Program will probably provide more direct opportunity for vessels to increase their efficiency than for processors.	
Initial QS Allocation	***A self-perpetuating "leg up."*** *The initial allocation constitutes a "free" infusion of capital, and, all else being equal, the firm receiving that infusion will experience greater opportunity to increase efficiency compared to firms not receiving an initial allocation.*	

Note: An initial allocation to crewmembers or communities might also give them a leg up in an effort to accumulate wealth.

Key questions to assess the direction of future QS flow are as follows:

- At present, do we believe that one sector tends to be more efficient than the other?
- Do we think that one will gain more efficiency under IFQs than the other?
- If there is a difference between the sectors, and the less efficient sector is gaining efficiency, do we think the gain will be enough to overcome the initial deficit?

E.5.2 Vertical Integration, Quasi-rents, and Economic Rents

The initial allocation of QS will be an asset that processors may use to increase their vertical integration, placing them in a stronger financial position and strengthening their competitive stance.

Under the accumulation limit grandfather clause, processors (buyers) receiving an initial allocation of QS (based on permits they hold or direct allocation for processing history) that exceeds the accumulation limits will have a unique advantage over later entrants who will not be able to achieve the same level of vertical integration. However, while that advantage will allow them to horizontally integrate (although with the support of QS for the expanded operation) or otherwise increase their competitiveness, because of control accumulation limits, they will not be able to acquire more QS beyond the grandfather clause ceiling. Once the business ownership changes, the grandfather clause expires, and the amount in excess of the accumulation limit will flow back onto the market. When 25 percent of the QS is allocated to

processors, a greater proportion of the QS received by processors will exceed the accumulation limits than that of firms that harvest only (see Sections A-2.1.1 and A.2.2.3.e). With the grandfather clause, the more allocated directly to processors, the more of the total QS will be held by firms in excess of accumulation limits. Because any QS that a firm at its accumulation limit divests itself of cannot be repurchased, the QS held by those over accumulation limits is more likely to remain off the market than QS held by those below the accumulation limits.

If there is no grandfather clause, an already strongly vertically integrated company may be weakened by the need to divest itself of harvesting assets. One aspect of the competitive position among processors would be evened out; all processors (existing and new entrants) would be restricted to the same amount of vertical integration. This change in the within sector strength of competitors would affect the future distribution of QS within the processing sector.

Table E-22. Influences of status quo, IFQ program, and QS initial allocation on vertical integration and QS flow (shaded cells repeats information in previous sections).

	Harvesters	**Processors**
Status Quo	Reasons for vertical integration are market security, protecting profits associated with specialized assets, rent (profit) capture, and market foreclosure (preempting a competitor's access to a market). Under status quo, firms can acquire assets to engage on either side of the raw fish market (harvesters can acquire processing assets and processors can acquire harvesting assets). Expansion into the other sector also requires management time and expertise. In practice, there appears to be more acquisition of harvesting assets and little significant entry into processing by harvesting firms.	
IFQ Program	Harvester vertical integration will not be constrained by accumulation limits. Vertical integration for harvester is covered more completely under market power.	Under IFQs vertical integration and QS access motivated by vertical integration may increase as follows: • The opportunity to own QS may provide a less expensive way for processors to respond to existing pressures for vertical integration (ensuring market security or protecting unmalleable assets). • As harvester profits increase, harvesters may become more of a target for vertical integration. • The exclusivity of QS provides a new opportunity for processors to increase their market share by acquiring QS and thereby foreclosing the opportunity of competing processors. At the same time, accumulation limits may substantially limit processor ability to vertically integrate and could even reduce existing levels of vertical integration. Accumulation limits would prevent processors from supporting as great a proportion of their production as harvesters, because processors handle larger volumes than harvesters do on a per operation basis. Vertical integration through direct ownership of vessels would also be constrained by accumulation limits because any QP put on the vessel would count against a processor's accumulation limits. Any processor with vessel capacity that substantially exceeds the accumulation limits may divest themselves of some of those vessels.
Initial QS Allocation	*Firms receiving an initial allocation will be in a stronger financial position to vertically integrate, thereby strengthening their financial position and competitive stance.*	
		Under the grandfather clause, processors (buyer) receiving an initial allocation of QS that exceeds the accumulation limits will have a unique advantage over later entrants. However, accumulation limits will prevent those grandfathered in from using that advantage to acquire QS. Once the grandfather clause for those QS expires, there will be a new flow of QS onto the market. *The more allocated directly to processors the more of it that will be held by firms in excess or at accumulation limits (if there is no grandfather clause). Because any QS divested cannot be repurchased, the QS held by those at accumulation limits is more likely to remain off the market than QS held by those below the accumulation limits.* *If there is not a grandfather clause, an already strongly vertically integrated company may be weakened by the need to divest itself of harvesting assets and affect the future distribution of QS within the processing sector.*

Key Question:

1. If there is no grandfather clause, to what degree will smaller processing companies be strengthened? If larger companies receive fewer QS and is a relative strengthening of smaller companies, would those companies use that strengthening to buy QS up to the accumulation limits?

E.5.3 Market Power, Horizontal Integration, and Consolidation

To simplify the discussion in this section we will address the initial allocation issue from the perspective of its effect on QS flow in the long term as the amount of QS allocated to processors increases. Our concern in that regard is how the initial allocation affects market power. The more market power a sector has, the more likely it is that QP will flow toward that sector.

This discussion provides additional detail on the effects of the initial allocation on market power, as displayed in tables each on the factors that determine market power, as follows.

Rivalry	(Section E.4.3.1)	Table E-23
Bargaining Power	(Section E.4.3.2)	
Table E-25		
Barriers to Entry	(Section E.4.3.3)	Table E-26

Readers are encouraged to review the tables, then look to the discussion to provide additional information on the findings displayed in the tables.

Discussion of Results in Tables

For harvesters, competition in the raw fish market will increase as the amount of the initial QS allocation to harvesters declines and that to processors increases. If processors cannot reach agreements with existing harvesters, latent permits may be activated to meet processor needs, increasing the number of active harvesters. As the allocation to processors increases, the financial health of the largest producing vessels and financially weakest firms may be diminished. The largest producing harvesters may not achieve the level of production they would have if there had been a 100 percent allocation to harvesters and a grandfather clause.[32] The largest harvesters need the benefit of the grandfather clause if they are to attain close to their historic production levels. The only way they can benefit from the grandfather clause is through what they receive in the initial allocation. If the amount of QS they receive as part of the initial allocation diminishes as a result of the allocation to processors, the level at which they are grandfathered in will be lower. If harvesters are grandfathered in at lower levels, the level of concentration in the sector will be closer to what would be expected over the long term as the grandfather clause expires.

To achieve previous production levels, some harvesters may have to borrow money to acquire QS or enter into raw fish delivery price negotiations with processors. This will have a more significant adverse effect on the weaker firms than on the stronger firms and will move the harvesting sector through its shakeout and adjustment period more quickly. At the same time, any QS received will reduce the barrier to exiting; thus, as the amount harvesters receive goes down, the incentive to stay in the fishery will increase. A more rapid adjustment period with more stress on financially weak firms and higher exit barriers will increase strategic stakes, and rivalry will be more intense during initial phases of the program. Negotiations with processor for access to processor-held QP may be an important factor in determining which harvesting firms survive. With less of an initial allocation, harvesters will be in a somewhat

[32] Processors do not need QP to produce and so can achieve their historic production levels even if they do not receive an initial allocation.

weaker position with respect to the assets they have available to threaten more vertical integration as part of their price negotiations. The initial allocation will also provide harvesters with a competitive advantage vís a vís new entrants. On one hand, that advantage diminishes as the amount of QS going to processors increases; on the other hand, the importance of the initial allocation as an advantage in competition in the raw fish market for access to processor-held shares increases.

The grandfather clause has less significance for competition within the harvester sector than it does within the processing sector. Within the harvesting sector, harvesters able to take advantage of the grandfather clause will have a cost advantage but will not be able to use that cost advantage to compete for QS or in the raw fish market because they will not be able to add QS or QP to their existing holdings. Processors will not experience the same limitations in using their advantage to expand market share.

With respect to rivalry within the processing sector, rivalry generally decreases as the concentration of market shares increase. Market share concentration will likely be influenced by the concentration of the initial allocation of QS. Some processors own permits and will, therefore, receive an initial allocation regardless of whether there is an explicit allocation to processors. If there is no direct allocation to processors, there will be greater differences in the allocations among processors (five processors that also own permits would receive an initial allocation). QS will be most evenly distributed among processors if there is an allocation to processors, but no grandfather clause, thus increasing rivalry. Under such circumstances, smaller processors (processors that would not receive enough initial allocation to put them above the accumulation limits) will receive a greater initial allocation, increasing the security of their access to raw product and putting them in a better position to acquire additional QS and compete with larger processors. Rivalry will likely decrease if there is an allocation to processors and a grandfather clause. More of the QS will be concentrated among larger processors than without a grandfather clause.

The initial allocation will also lower the exit barrier, providing compensation for leaving the fishery and reducing the intensity of the competition to remain in the fishery. Those choosing to leave the fishery will provide remaining participants with an opportunity to consolidate and expand operations. At the same time, the additional endowment will also give all existing processors receiving an initial allocation an advantage over any new entrant (raising the entry barrier). For larger processors, in particular, the initial allocation (with a grandfather clause) will provide an opportunity to produce at a larger scale with a lower risk profile, increasing the competition barrier for new entrants. Over time, a decreased exit barrier and increased entry barrier would be expected to increase consolidation.

With respect to processor bargaining power, as the amount of QS allocated to processors increases, their position in negotiating raw fish prices with harvesters will improve because of their option to use their own QP on their own vessel or to activate a latent permit. If all QS goes to harvesters, for as long as the QS remains in harvester hands, at least initially, direct harvester competition for market share in the raw fish market should be minimal.

The initial allocation also provides an asset to support increased vertical and horizontal integration by smaller companies. Those receiving large amounts of QS would be limited in their ability to use it to acquire QS because of their accumulation limits. However, even for those larger initial recipients, the capital infusion could provide an advantage in the acquisition of processors that do not hold QS. Whether this occurs would likely depend on the relative efficiency gain when a large processor acquires a new facility without additional QS to support production at that facility as compared to a smaller company acquiring the same facility, but with the benefit of QS to support the production. If the efficiency gains for a large company expanding without QS are sufficient, then the capital infusion represented by QS may allow them to aggregate additional processing operations (or expand existing operations).

Table E-23. Influences on rivalry of status quo, IFQ program and QS initial allocation (as more QS goes to processors) (shaded text repeats previous tables) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change.

Factor Causing Greater Rivalry		Harvesters	Processors
1. A larger number of firms with similar market shares	Status Quo	+ Under status quo: larger than number of processors. + Entities with similar market shares. Potential sector participants include latent permit holders.	- Small number of firms. Very restricted in some localities. Market shares highly concentrated, going mainly to a few companies.
	IFQS	- A decrease in the number of active harvesting vessels and harvesting companies (subject to accumulation limits). Much of the rivalry for market share will be focused on the QS/QP market. However, for harvesters who do not own their own QS, this competition may also involve rivalry in the raw fish market. - Limited opportunity for latent capacity in the sector to become more active, except through direct reductions by active vessels through QS/QP transfers.	+ Decreased geographic isolation of markets, increasing number of participants. + Some pressure for consolidation in response to existing overcapitalization and threat of harvester market power. - However, if there are effective accumulation limits growth of market share for larger firms will have to occur without the advantage offered by QS ownership.
	Initial QS Allocation	*+ Latent permits may be activated to handle processor owned QP, increasing the number of participants.* *As more QS goes to processors, and those processors receive more allocation than can be serviced with processor owned vessels, then there will be more competition among harvesters for the opportunity to utilize latent capacity to deliver raw fish on processor owned QP.* *The long-term distribution may be achieved more quickly in that there will not be as many permits receiving QS as high above the accumulation limits.*	*? Concentration of market shares will be influenced by the QS allocation. If there is a grandfather clause, there will be greater concentration of the QS allocation among processors regardless of whether there is an initial allocation to processors (because of processor-held LE permits). If there is no grandfather clause, an allocation to processors will result in a more even distribution of QS until the grandfather clause expires.* *The initial allocation will be an asset to support growth for smaller firms. For larger firms (at accumulation limits), use of the initial allocation as an asset to support further horizontal consolidation will depend on the relative incremental efficiency of a large firm expanding without QS compared to a small firm expanding with QS.*
2. Slow market growth	Status Quo	+Yes	+Yes
	IFQs	O	o
	Initial QS Allocation	O	*o*
3. High fixed costs	Status Quo	+Yes	+Yes
	IFQs	+ Increased fixed costs (e.g., camera systems), but for harvesters with QS, the increase influences rivalry in the QS/QP market more than the raw fish market. - Incentive to exert market power in the raw fish market to increase profits and recover fixed costs.	o Minor increase relative to vessels.
	Initial QS Allocation	*o*	*o*
4. High storage costs or highly perishable products	Status Quo	+Yes	+Yes
	IFQs	O	o
	Initial QS Allocation	O	*o*

Table E-24. Influences on rivalry of status quo, IFQ program and QS initial allocation (as more QS goes to processors) (shaded text repeats previous tables) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change. (continued)

Factor Causing Greater Rivalry		Harvesters	Processors
5. Low cost for customers to switch suppliers	Status Quo	+Yes	+Yes
	IFQs	O	O
	Initial QS Allocation	O	*o*
6. Low levels of product differentiation	Status Quo	+Yes	N/A
	IFQs	O	o
	Initial QS Allocation	O	*o*
7. Strategic stakes are high	Status Quo	+Moderate for nonwhiting, high for whiting	+Yes
	IFQs	O	+ Increased strategic stakes, expansion requires direct displacement of competitors, more limited vertical integration opportunities.
	Initial QS Allocation	*+ Increase as more goes to processors. More rapid shakeout. Those able to partner with processors to acquire QP and increase scale of their operations are more likely to survive over the long term.*	*Change and uncertainty may increase action based on perceived strategic stakes.*
8. High exit barriers	Status Quo	+Yes	+Yes
	IFQs	o	o
	Initial QS Allocation	*+As more of the initial allocation goes to processors, exit barriers will be higher.*	*-Reduced exit barriers. Selling the QS may be a way to clear off debts/accumulate savings and leave the industry.*
9. A diversity of rivals	Status Quo	o Uncertain	o Uncertain
	IFQs	O	o
	Initial QS Allocation	O	*o*
10. Industry Shakeout.	Status Quo	- Constrained by management system	o Uncertain
	IFQs	+ Expected	o Possible
	Initial QS Allocation	*+As more goes to processors, the intensity of the initial adjustment and speed of the shakeout will increase. There will not be as many firms as high above the accumulation limits (assuming a grandfather clause); financially weaker firms will drop out more quickly.*	*The initial distribution will alter the balance of competitive advantages among existing processors and may lead to new entry, a shakeout, or stabilize existing participants.*
Summary	Status Quo	Many reasons to expect high rivalry. However, license limitation constrains threat of new entrants; for nonwhiting, two-month limits minimize opportunity to compete for market share.	Many reasons to expect high rivalry. However, high concentration indicates shakeout may have already occurred; and threat of intense competition may discourage strong moves to expand market shares.
	IFQs	After an initial shakeout, rivalry will decrease because of fewer harvesters and accumulation limits constraints. The need to cover fixed costs may stimulate rivalry in the QP market and cooperation in the raw fish market. Rivalry in the raw fish market will occur to the degree that processors provide QP linked with raw fish exvessel price negotiations.	Rivalry will increase as a decrease in the geographic isolation of raw fish markets expands the number of effective participants, processors position themselves to defend against the possible exercise of harvester market power, competition for market share requires direct displacement of other processors, and accumulation limits constrain existing and potential vertical and horizontal integration.
	Initial QS Allocation	*+As more QS goes to processors, rivalry in the raw fish markets will increase as harvesters vie for processor held QP needed to achieve the larger scale of operations and efficiency needed survive the initial shakeout. Exit barriers will be higher increasing the intensity of the competition to remain in the fishery.*	*Quite a bit of uncertainty about effect, some of it related to the decision on a grandfather clause for processors. Some shift in the balance of power within the sector could lead to a shakeout (particularly if larger firms are disadvantaged by accumulation limits and no grandfather clause).*

Key Questions:

Which will be more profitable, taking into account variation in risk?

- A processing facility purchased by a small company that can also acquire QS for a significant amount of the facility's raw product needs?
- The same processing facility purchased by a larger processing company that cannot acquire additional QS to cover the facility's raw product needs?

If the former is more profitable, the IFQ program may inhibit further consolidation in the processing sector. If the latter is more profitable, consolidation may continue and may accelerate with the infusion of capital represented by IFQs (depending on balance with other factors such as changes in harvester market power and ability to vertically integrate).

Will there be a grandfather clause for processors? If not, an initial allocation to processors may advantage small processors relative to larger processors.

Table E-25. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on bargaining power status and QS flow (shaded text repeats previous tables; "-" = indicator or less power, "+" = indicator of more power, "o" = no change).

Indicators of Sector Power		**Harvester (Supplier) Evaluation**	**Processor (Buyer) Evaluation**
Threat of vertical integration is addressed in more detail the section above on vertical integration. Sector Concentration is addressed in more detail in the above table on rivalry.			
Threat of vertically integrating with other sector	Status Quo	- Not much threat	+ Threat
	IFQ Program	+ Harvesters may vertically integrate by retaining ownership of fish while they are being processed (demanding custom processing services). + Harvesters may exert vertical influence by using QS to encourage new entry by processing concerns.	+ Increased incentive. - Threat limited by accumulation limits - Possible reduced vertical integration for firms with strong vertical integration due to accumulation limits.
	Initial QS Allocation	Financial resources for threatening vertical integration diminish.	Increased viability of vertical integration for firms not at QS accumulation limits.
Sector concentration	Status Quo	- More firms than processors. - Even distribution of market share	+ Relatively few. + High market share concentration
	IFQ Program	+ Increased concentration. + Reduction of potential for competition through activation of latent permits.	- Decreased geographic isolation of local markets. + Pressure for consolidation/integration - Consolidation/integration constrained by accumulation limits.
	Initial QS Allocation	*- Potential for activation of latent permits or capacity to service processor held QS increases number of possible participants*	*+ Processor held QP can be used to activate latent permits, decreasing harvester sector concentration.* *? Effect on processor concentration is uncertain. More concentration if larger firms expanding without the support of QS gain more profits than smaller firms expanding the same amount but with the support of QS, and a grandfather clause applies to the accumulation limits. The initial allocation will be an asset that may support consolidation.*

Table E-24. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on bargaining power status and QS flow (shaded text repeats previous tables; "-" = indicator or less power, "+" = indicator of more power, "o" = no change). (continued)

Indicators of Sector Power		Harvester (Supplier) Evaluation	Processor (Buyer) Evaluation
Switching Costs (buyer to a different supplier or supplier to a different buyer)	Status Quo	- No significant costs.	+ No significant costs.
	IFQ Program	O	O
	Initial QS Allocation	*O*	*O*
Buyer customer power (customer willingness to boycott in support of supplier)	Status Quo	- No	N/A
	IFQ Program	O	N/A
	Initial QS Allocation	O	*N/A*
Harvesters' products are highly differentiated from one another	Status Quo	- No	+ No
	IFQ Program	o	O
	Initial QS Allocation	*o*	*O*

Table E-26. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) and QS flow.

Changes to Barriers to Entry		Harvesters	Processors
Government Regulation	Status Quo	Limited number of permits but some "latent." Heavily regulated.	Fishery management related regulations less heavy than for harvesters but also face environmental regulations (waste discharge).
	IFQ Program	+Increased fixed costs. +Absolute barrier to entry and expansion.	Minor increased fixed costs.
	Initial QS Allocation	The QS needed for participation will not be affected by who receives an initial allocation. Relative advantage for initial recipients is addressed under economies of scale.	Relative advantage for initial recipients is addressed under economies of scale.
Special Proprietary Knowledge	Status Quo	Fishing locations.	None identified.
	IFQ Program	o	o.
	Initial QS Allocation	o	O
Asset Specificity (Maleability)	Status Quo	Very specific (geographic relocation possible)	Very specific Shoreside—not mobile some utility in other sectors. At-sea—mobile
	IFQ Program	o	O
	Initial QS Allocation	o	O

Table E-25. Influences of status quo, IFQ program, and QS initial allocation (as more QS goes to processors) on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) and QS flow. (continued)

Changes to Barriers to Entry		Harvesters	Processors
Economies of Scale	Status Quo	-	
	IFQ Program	+ The cost of achieving any given level of scale will be increased by the need to acquire QS.	+ If processors in the industry acquire QS, the cost to new entrants to reach a similar level of scale, efficiency, and risk control will be increased by the need to purchase QS. Accumulation limits create an absolute barrier in ability to protect higher production levels through ownership of IFQ.
	Initial QS Allocation	*The effect of the initial allocation on the barrier to entry for harvesters will not be as great as for processors.* *+Harvesters receiving an initial grant will have some short-term financial advantage over new entrants in competition to acquire additional QS and achieve greater economies of scale. This advantage will be diminished as more of the initial allocation goes to processors, but will also become more important as competition in the raw fish market increases with an increasing allocation to processors.* *o Those harvesters grandfathered in at greater levels of production may have greater profit opportunity than others; however, they will not be able to use those profits for the expansion of their harvesting operations. Therefore, it will not cause a competition barrier for new entrants.*	*+ If processors receive an initial allocation, over the short term, the barrier to new entrants may increase because of the relative financial advantage provided by the grant of the asset.* *+ If some processors receive an initial allocation of QS, grandfathered in above the accumulation limits, those processors may have efficiencies of scale that provide them with greater profits than would be available to new entrants or those who could only achieve a similar level of production without the benefit of support of their own QS.*

E.5.4 Access to Capital

Demand.

- **Time Preference.** The initial allocation will raise individuals' wealth level. If their income was relatively low, this may decrease their time preference, leading them to be willing to pay more for QS.
- **Risk.** Those receiving an initial allocation of QS will have more secure access to their expected fishery related income. This may increase their willingness to incur additional debt in order to purchase more QS (giving them an advantage over those who do not receive QS).
- **Planning Horizon and Investment Recovery.** The initial allocation is not expected to have an effect on planning horizons or amount of investment a firm needs to recover.

Supply. Those receiving an initial allocation will experience an increase in wealth. They will be viewed as lower risk borrowers than they were before they received the initial allocation. A lower risk profile will give them cheaper access to capital and enable them to more easily accumulate additional QS, up to accumulation limits. It will also put them in a better position to acquire capital for other improvements, which may lead to further business growth and additional QS purchases. Harvesters need access to QS/QP in order to produce. A harvester under economic stress that does not receive enough of an initial allocation for its business plan may find it difficult to acquire financing to purchase more QS and would, therefore, have to cease production or rely on QP provided by others to stay in business. Processors do not need direct access to QS for processing activities; therefore, QS/QP is not a key input. At the same time, processors with an initial allocation may be viewed as less risky, particularly if it appears that after IFQ program implementation harvesters may be in a position to exert market power. An initial allocation

to crew would likely represent a substantial boost in their capital, increasing their ability to accrue additional capital, including QS. The funding base for communities is large enough that an initial allocation of QS is not likely to affect their access to capital. See Table E-26.

Table E-27. Influences of status quo, IFQ program and QS initial allocation on access to capital and QS flow.

		Harvesters	Processors	Crew	Communities
Demand for Capital					
Time Preference	SQ	Those with high time preference will not be willing to pay as much for QS.			
		Indication of high time preferences.	Uncertain	Low income may lead to high time preference.	Uncertain
	IFQ Program	No change.			
	Initial QS Allocation	*Increased wealth of initial recipients may increase their willingness to pay for QS.*			
Risk	Status Quo	Those who believe that the future holds greater risk than others believe will have a lower willingness to borrow.			
	IFQ Program	The fishery managed with IFQs will have inherently less risk. Personal assessment of future risk may change for those who acquire QS.			
	Initial QS Allocation	*Increased income security of those receiving an initial allocation of QS may increase their willingness to incur additional debt in order to purchase more QS.*			
Planning Horizon and Investment Recovery	Status Quo	Those who have a longer planning horizon for the use of an asset may be willing to pay more to acquire it (as compared to someone acquiring the same asset with a shorter horizon). [This outcome depends on there being a limited ability to recover investment through sale of the asset at the end of the planning horizon.]			
	IFQ Program	Those who have a longer planning horizon or need a longer time to recover a capital investment or have a larger capital investment (for which QS can help secure their return) will be willing to pay more for QS. There is no basis to distinguish among groups.			
	Initial QS Allocation	*The initial allocation is expected to have no effect.*			
Supply of Capital					
	Status Quo	The overall financial position of a firm will be evaluated in determining loan worthiness. Firms are likely to receive more favorable terms for a loan if they are larger, diversified, and have assets that may be used as security and are of value outside the industry.			
		Harvesters less likely to have capital useful in other industries. Of generally smaller total size than processors.	Firms more likely to have capital that may be useful in other industries. Firms often of larger size than harvesting firms.	Not likely to have fishing business related assets for use as collateral. This may mean higher costs of borrowing.	May have cheaper access if the governing body is viewed as lower risk.
	IFQ Program	In general, the IFQ program will likely decrease risk in the industry, reducing the cost of access to capital. QS are of tenuous value as collateral but important to the viability of a firms business plan. Firms with cheaper access to capital will be more likely to accumulate QS.			
		Risk may decrease with greater stability & possible increase in market power.	Processors may experience a risk increase associated with harvester market power, increasing capital costs.		
	Initial QS Allocation	*Initial recipients will experience increased wealth and be viewed as lower risk borrowers. Cheaper access to capital will likely spur their growth and lead to future QS purchases up to limits.*			
		QS/QP is needed for production. Firms under financial stress will be viewed as high risk and may find it difficult to acquire financing to purchase QS/QP they do not receive as part of the initial allocation.	*Direct access to QS/QP is not needed for processing activities.* *An allocation of QS may increase security of access to raw product, reducing risk and cost of capital.*	*An initial allocation would likely represent a substantial boost in the capital owned by crewmembers and increase their ability to accrue additional capital, including QS.*	*An initial allocation appears unlikely to change the communities standing the capital market.*

E.6 References

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