

**Protectionist Response to Import Competition
in Declining Industries Reconsidered**

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November 1995

1995-96 Discussion Paper Series No. 9596-01

dp9596-01
pages: 17

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*I am grateful to Oliver Hart for his advice and encouragement for this research. The preliminary draft of this paper was written while I was visiting the Center for Economic Studies, University of Munich and the Institute for Advanced Studies in Vienna, Austria. I thank these two institutions for their hospitality during my stay. The financial support for this research was partly provided by the Austrian Ministry of Science and Research.

I. Introduction

In a seminal article on the political economy of trade protection, Hillman (1982) proposed a theory of endogenous protection in which the level of protection provided to an import-competing industry is determined as an outcome of political competition by agents in the economy. Hillman adapts the regulation model of Stigler-Peltzman to this international setting in which the government is viewed as a less benign, *political support-maximizing* agent.

More specifically, he uses a Ricardo-Viner type specific factors model of international trade where owners of the factor specific to the import-competing sector lobby for protection whereas owners of other factors oppose it. Adopting the Stigler-Peltzman assumption employed in the context of regulation, he first specifies a political support function which depends on the welfare levels of two competing groups which, in turn, depend on the level of the regulated domestic industry price.¹ The implication of this set-up is that the industry's domestic price is invariant to import price changes because the political support-seeking policy-maker will always ensure that the domestic price is maintained at the level where the political support function is maximized. Therefore, the import tariff will be adjusted to exactly offset any exogenous changes in the world price.

To escape the conclusion of a static domestic price and to derive more interesting price dynamics in the face of intensifying import competition, Hillman amends the Stigler-Peltzman political-support function (SPPSF) by assuming that political support rather depends on the *divergence* of welfare levels from their anarchistic free-trade counterparts rather than on the welfare levels *per se*. In other words, political support is responsive only to "gains and losses due to the authorities' acting to cause the domestic price to deviate from the world price via tariff intervention"; economic agents blame or credit the government on their welfare changes *only if* they are caused by government intervention. By resorting to this alternative assumption, he derives price dynamics in

¹Based on Bernheim-Whinston's menu auction framework, Grossman and Helpman (1994) provide microfoundations for the reduced-form political-support function.

which declines in the world price lead to corresponding declines in the domestic price.² Therefore, if the world price continues to decline, protection will not be sufficient to sustain a domestic price above the break-even point for the domestic producers and import competition eventually induces them to exit. This result enables him to conclude that "[p]olitical-support motivated protection to a declining industry is accordingly transient, and terminal (p.1184)." Hillman's paper, thereby, gives an impression that a direct implication of the static domestic price derived from the original SPPSF is permanent protection that shields the industry indefinitely from outside competitive pressure.

In this paper, I argue that, in contrast to Hillman's (1982) seminal article, the government may provide only temporary protection to the declining industry *even with* the Stigler-Peltzman type political-support function if the world price continues to decline. Hillman's logic in the political-support maximization problem, is flawed in that he inadvertently leaves out the possibility of corner solutions where the industry is left to shut-down.³ From the outset, thereby, the government's incentive to remove protection is simply ruled out by restricting his attention on the interior solution. If the possibility of pure consumer protection is considered, temporary protection can be restored as a political equilibrium. As a result, I establish that Hillman's main conclusion of temporary protection is robust to alternative specifications of the political support function. This point is important because it is not clear *a priori* which specification is more plausible. In fact, a subsequent study by Long and Vousden (1991) takes issue precisely with Hillman's specification of the political support function. According to them, "it may be more reasonable to suppose that people care about changes in welfare (whatever their cause) relative to the situation before the fall [in the world price]."

Even though both specifications predict temporary protection, the price dynamics generated are qualitatively different across specifications. SPPSF predicts a static price followed by a sudden drop in the domestic price accompanying trade liberalization

²It is even possible that the policy-maker's response to a decrease in the world price accelerates the decline of the domestic price.

³This case is called pure "consumer protection" by Peltzman (1976).

whereas the Hillman specification predicts a continuous price decline even during the period of protection.

In section III, I modify the basic model with SPPSF by allowing partial mobility of specific capital used in the import competing sector. With convex costs of adjustment, it is shown that the price dynamics now resemble those of Hillman (1982). However, the mechanisms responsible for the decline of domestic price before liberalization are fundamentally different across models.

II. The Hillman Model with the Possibility of Shut-Down.

A. The Original Hillman (1982) Argument⁴

Suppose that the government maximizes the following SPPSF:

$$\tilde{M}(P) = M(\Pi(P), P), \quad (1)$$

where P is the domestic price in the import competing industry and $\Pi(P)$ is the corresponding industry profits. Higher industry profits elicit greater political support from the owners of the factor specific to the industry. Consumers, however, are antagonized by higher prices; $M_{\Pi} > 0$ and $M_P < 0$. Further assume that $\Pi_P > 0$, $\Pi_{PP} < 0$, $M_{\Pi\Pi} < 0$ and $M_{PP} < 0$ in the relevant range.⁵

Let P^* and T denote the world price and the specific tariff, respectively. Then, I have

$$P = P^* + T \quad (2)$$

Let me define

$$P^0 = \operatorname{argmax} M(\Pi(P), P) \quad (3)$$

⁴See Hillman (1982) for details.

⁵To facilitate comparison, I follow closely the notation used by Hillman (1982).

Then, the government sets the domestic price to be equal to P^0 by using trade policy instruments, i.e.,

$$P^0 = P^* + T \quad (4)$$

This implies that the tariff is adjusted to exactly offset any changes in the world price to ensure that the static political support maximizing price P^0 always prevails in the domestic market, i.e.,

$$dT = -dP^* \quad (5)$$

Equation (5) is the basis for Hillman's conclusion that SPPSF renders permanent protection to the declining industry.

B. Political Support Maximization with Corner Solutions

I submit that the original Hillman argument hinges crucially on the exogenously imposed constraint that $\Pi(P) > 0$. More precisely, let P^s be the break-even price for the industry. Then, Hillman limits his attention to domestic prices higher than P^s in the policy-maker's political support maximization problem. In other words, his permanent protection result with SPPSF is, in a sense, preordained from the outset by excluding the possibility of shutting down the industry.

To see this, consider Figure 1(a), which depicts the indifference curves for the government with the industry profit function. Suppose that the world price declines continuously. Then, the government will support the domestic price at the level of P^0 until the world price P^* reaches \bar{P} , at which point the government is indifferent between protection and trade liberalization, i.e.,

$$M(\Pi(P^0), P^0) = M(0, \bar{P}) \quad (6)$$

However, if the world price falls further than that, the government prefers trade liberalization and opts for pure consumer protection by removing the tariff protection. As a result, the domestic price experiences a discontinuous drop to the level of the world price and continues to decline as the world price falls further from that point along the thick line in Figure 1(a).

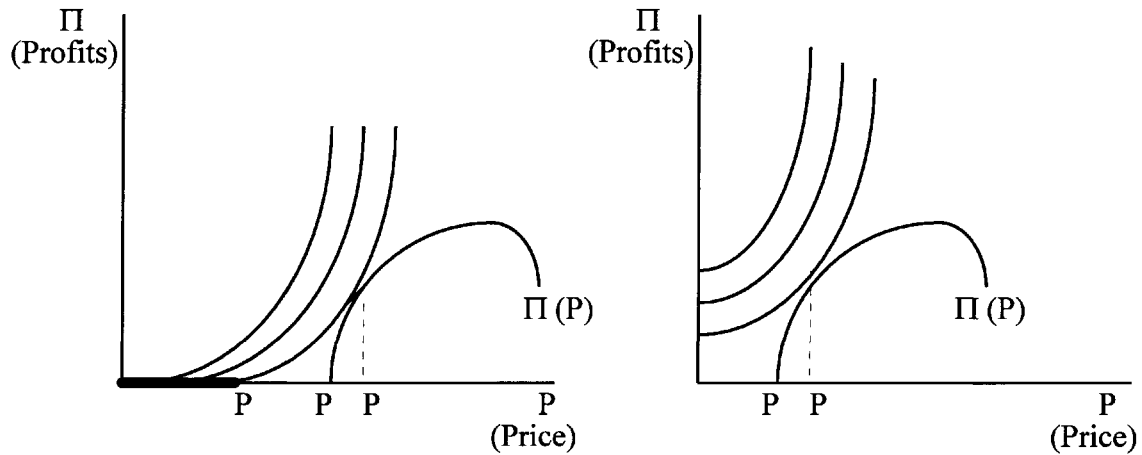


Figure 1(a).

The Case of Corner Solutions

Figure 1(b).

The Case of an Interior Solution

Figure 1: Political Support Maximization with the Stigler-Peltzman Specification

As is clear from Figure 1(a), $\bar{P} < P^s$. Therefore, whether protection is permanent or temporary depends on the existence of such a \bar{P} on the positive axis, that is, whether the *iso-majority* curve (indifference curve for the policy-maker) tangent to the profit function crosses the P axis in the positive quadrant.⁶ Indeed, the difference between Figure 1(a) in this paper and Figure 2 in Hillman's paper (p.1183) (reproduced as Figure 1(b) here) is in the location of the iso-majority curves. In Figure 1(a), the iso-majority curve that is tangent to the profit function intersects the P axis while it does not touch the P axis in Hillman's paper. Which one prevails in the economy depends on various parameters of the economy. One variable that determines the shapes and locations of iso-majority curves, *inter alia*, would be the competitiveness of domestic producers vis-à-vis foreign producers. If the break-even point P^s is closer to 0 (i.e., domestic producers are relatively efficient), it is more likely that the case of Figure 1(b) prevails in the economy. Figure 1(a), however, is more likely with relatively less competitive domestic producers. In this case, the government will let them exit eventually because sustaining them forever involves too high a political cost. Note that the dependence of permanency of protection (or lack of it) on the relative competitiveness of domestic producers is not

⁶The term “iso-majority” curve is borrowed from Peltzman (1976).

confined only to the SPPSF specification. The same applies to Hillman's anarchistic-reference-point political support function in that the transience of protection is true only when domestic producers are sufficiently inefficient compared to foreign producers. Therefore, both specifications generate a qualitatively similar result on the transience of protection.

Once we allow for the possibility of pure consumer protection, therefore, temporary protection can arise as a political equilibrium under alternative political support function specifications. The price dynamics, however, exhibit qualitatively different patterns across specifications. With the Hillman-type specification the domestic price declines continuously in the face of a declining import price even before the removal of protection. SPPSF specification, in contrast, predicts a static price that is followed by a precipitous drop to the level of the world price with trade liberalization (See Figure 2).

One question that can be asked is why the policy-maker would not choose a price lower than \bar{P} initially if it can generate a higher level of political support than P^0 that protects the sector. Why does he wait until the world price reaches \bar{P} ? The reason is that the iso-majority curves for the policy-maker are drawn assuming that there are no subsidy payments from the government that drain the treasury. In a realistic case where the government faces a budget constraint, the choice of prices lower than the prevailing world price will certainly entail financing by distortionary taxes and will definitely reduce political support.⁷ Therefore, the choice of prices lower than \bar{P} without any subsidy on imports would be possible only when the world price *itself* declines to this level.

⁷The analysis can be extended by explicitly introducing the political cost of financing subsidy payments by a distortionary tax into the policy-maker's objective function.

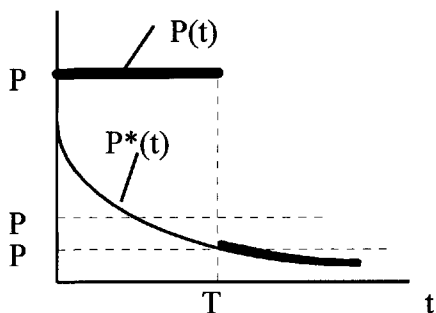


Figure 2(a).

The Case of SPPSF

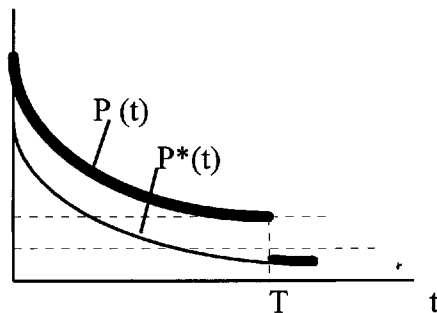


Figure 2(b).

The Case of the Hillman Specification

$P^*(t)$ = the world price (thin curves), $P(t)$ = the domestic price (thick curves)

Figure 2: Price Dynamics with Political Support Maximization

C. Rationale for Quota Protection

The optimal price dynamics generated by SPPSF may also explain the choice of a quota over a tariff as a favorite instrument to achieve the same level of protection. Note that the equilibrium values of the domestic price and quantity consumed and the level of imports with a tariff can be replicated by an equivalent quota. In the face of a declining import price, however, a quota may have a political advantage over a tariff in that the level of the quota, once it is implemented, does not need to change until the world price level reaches the critical value P^* whereas a tariff requires constant readjustment for the tariff protection to sustain the same static political-support-maximizing price P^0 . This is because the tariff has to counterbalance any changes in the world price to keep the level of imports constant and sustain the static political support maximizing price.

Consider the transparency explanation for the choice of instrument proposed by Magee (1988). According to him, the choice of instrument is governed by the “principle of optimal obfuscation” which induces policy-makers to opt for a less transparent means of income transfers to mitigate political backlash from the adversely affected groups. It is often argued that quota is politically less costly due to the fact that the protective effect of a quantitative restriction is less transparent to the losers from protectionist policies than a tariff which provides an explicit expression of the increase in the domestic price over the world price. The asymmetry in the transparency of protection would be more

conspicuous when the world price continues to fall. The constant readjustment in the tariff to offset any fall in the world price may expose the government to the criticism of “capture” by the protected industry and may prove to be politically more costly than the equivalent quota.

III. Price Dynamics with Adjustment Cost

Protection against import competition in a declining industry is often justified by the need to compensate the owners of the specific factor to the industry for their loss of income. Up to now, we analyzed the time path of protection provided to a declining industry on the assumption that specific capital used in the importing sector is immobile. In this section, I allow partial mobility of specific capital to explore the implications of this adjustment possibility for the price dynamics and industry rationalization.

To analyze the dynamic exit process of capital from the declining import sector, assume that $\Pi(P)$ represents rents earned by one unit of capital in the importing sector when the domestic price of the imported good is given by P . The ownership of industry-specific capital is dispersed. When the capital is moved to other sectors, it earns a competitive rate of R^* .⁸ As in Mussa (1978), assume that the specific capital used in the importing sector can be converted to capital usable in other sectors with convex costs of adjustment. More specifically, let Δ be the rate of capital movement. Then, the cost of adjustment function for *each* unit of capital, $C(\Delta)$ satisfies the following properties:

$$C(0) = C'(0) = 0, \text{ and } C'(\Delta) > 0 \text{ for any } \Delta > 0 \quad (7)$$

With the possibility of changing sizes of industry due to partially mobile capital, it is natural to assume that the political influence of the industry also changes according to its size. As in Cassing and Hillman (1986), assume that the supply of protection provided to the import-competing industry depends on the absolute size of the industry. To incorporate this fact, I write the political support function in the following way:

$$\tilde{M}(P; K) = M(K\Pi(P), P) \quad (1)'$$

⁸To keep in line with the model in the previous section, the analysis takes a partial equilibrium approach.

where K is the amount of specific capital employed in the import-competing sector. In other words, the political weight given to an industry increases with the size of the industry.

As in the previous section, define $P^0(K)$ as:

$$P^0(K) = \operatorname{argmax} \tilde{M}(P; K) = M(K\Pi(P), P) \text{ subject to } \Pi(P) > 0 \quad (3)'$$

It can be easily verified that the optimal domestic price with protection, $P^0(K)$, increases with K , i.e., $dP^0(K)/dK > 0$; due to greater political clout, a bigger industry can solicit a higher level of protection.⁹

Also define the critical value of the world price, \bar{P} , at which the policy-maker is indifferent between protection and liberalization as:

$$M(K\Pi(P^0(K)), P^0(K)) = M(0, \bar{P}) \quad (6)'$$

Then, $\bar{P}(K)$ can be shown to decrease with K , i.e., $d\bar{P}(K)/dK < 0$; as the size of an industry and its corresponding political influence increases, it requires a lower world price for the beneficial consumption benefit to outweigh the political cost of trade liberalization.¹⁰

Note that $\bar{P}(K)$ is lower than the break-even point for the domestic producers, P^s . This implies that any remaining capital in the sector at the time of liberalization will eventually move to other sectors. With convex adjustment costs, however, there is an economic incentive to spread adjustment over time in order to avoid congestion rather than do it all at once. As a result, sectoral adjustment, in general, will begin before the actual trade liberalization *even if* the domestic price shielded by tariff protection provides

⁹By definition, $P^0(K)$ satisfies the following first-order condition: $M_{\Pi}(K\Pi_P) + M_P = 0$. Total differentiation of this first-order condition gives us:

$$\frac{dP^0}{dK} = - \frac{M_{\Pi\Pi_P}}{M_{\Pi\Pi}(K\Pi_P)^2 + M_{\Pi}K\Pi_{PP} + M_{PP}}$$

Since the denominator is negative by the second-order condition for the maximization of the political support function and $M_{\Pi} > 0$, $\Pi_P > 0$, we have $dP^0(K)/dK > 0$.

¹⁰Totally differentiating (6)' and applying the envelope theorem gives us:

$$M_{\Pi} \Pi_P dK = M_P d\bar{P}$$

Therefore, $\frac{d\bar{P}}{dK} = \frac{M_{\Pi} \Pi_P}{M_P} < 0$.

a higher return in the protected sector than R^* . The incentive for an early adjustment, however, reduces the size of the industry, which in turn, has a depressing effect on the optimal domestic price for the policy-maker and hastens the timing of trade liberalization.

More precisely, let $\Delta(t)$ and $P^*(t)$ be the rate of capital outflow from the importing sector and the world import price at time t , respectively. Suppose that trade is liberalized at time T . For this to happen, the amount of capital remaining in the importing sector at time T , K_T , must satisfy

$$P^*(T) = \bar{P}(K_T) \quad (8)$$

Let $K_0 = \bar{K}$ be the initial level of capital in the importing sector. Then, the rate of capital outflow from time zero to T satisfies

$$\int_0^T \Delta(t) dt = \bar{K} - K_T \quad (9)$$

Let me first analyze the dynamics of capital movement from the time of liberalization, T , on. Let τ denote the time period required for the capital movement to be completed. Since the world price that triggers liberalization is always below the break-even point, the equilibrium arbitrage condition, in conjunction with the boundary condition $\Delta(T+\tau)=0$, requires the following:

$$\frac{R^*}{r} - C(\Delta(s)) = \frac{R^*}{r} e^{-r(T+\tau-s)}, \text{ for any } T < s < T+\tau \quad (10)$$

Eq. (10) completely determines the dynamics of capital movement ($\Delta(s)$) from time T to $T+\tau$. Differentiation of (10) with respect to s yields:

$$-C' \Delta'(s) = R^* e^{-r(T+\tau-s)}, \text{ for any } T < s < T+\tau \quad (11)$$

Note that $\Delta(s)$ is monotonically decreasing in s for any $T < s < T+\tau$. Moreover, $\Delta(s)$ depends only on $\rho=(T+\tau-s)$, the remaining time to be elapsed for the capital movement to be completed. This allows me to write $\Delta(s) = \phi(T+\tau-s) = \phi(\rho)$, where $\rho = T+\tau-s$. Then, the cumulative capital movement from T to $T+\tau$ can be written as:

$$\Phi(\tau) = \int_0^\tau \phi(\rho) d\rho \quad (12)$$

For τ to be the equilibrium time span of adjustment for the capital remaining at time T (K_T), it is required that

$$\Phi(\tau) = K_T \quad (13)$$

Since $\Phi(\tau)$ is an increasing function of τ , Eq. (13) uniquely determines the equilibrium time needed for adjustment, τ , as a function of K_T . Note that $\tau(K_T)$ is increasing in K_T , signifying the fact that the more capital remaining in the industry at the time of liberalization, the more time is needed for the adjustment to be completed. In equilibrium, each unit of capital should earn the same rent as the last unit exiting the industry earns, which is $(R^*/r) e^{-r\tau}$. This, in turn, implies that the asset value of each unit of capital remaining in the importing sector at the time of liberalization depends on K_T .

If I define $V(K_T)$ as the asset value of remaining capital at the time of liberalization, the dynamics of pre-liberalization capital movement can be described by the following arbitrage condition:

$$\frac{R^*}{r} - C(\Delta(t)) = \int_0^T \Pi[P^o(K_s)] e^{-r(s-t)} ds + V(K_T) e^{-r(T-t)} \text{ for any } 0 < t < T,$$

where $K_s = \bar{K} - \int_0^s \Delta(t) dt$ and $V'(K_T) < 0$ (14)

As t approaches T , the RHS of Eq.(14) approaches $V(K_T)$, which is less than R^*/r . To restore the equality in Eq. (14), $\Delta(t)$ should be positive, meaning that the capital adjustment process starts even before liberalization. The pre-liberalization capital flight, in turn, causes a decrease in the regulated domestic price of the industry output and hastens the timing of liberalization through its effect on the political support function. Therefore, partial capital mobility with convex adjustment costs in the SPPSF specification generates price dynamics similar to Hillman (1982). However, the mechanisms responsible for the price dynamics are totally different across specifications. In Hillman (1982), the declining world price is directly responsible for the declining domestic price because in his specification, political support depends on the differential between the world and the domestic prices, not the absolute level of the domestic price. Here, the declining domestic price is, in a sense, self-inflicted on the owners of specific capital. In anticipation of the eventual liberalization, they start to exit the industry even before the liberalization in order to avoid congestion in the adjustment process. This

early exit from the industry reduces the political clout of the industry and causes a decline in the domestic price.

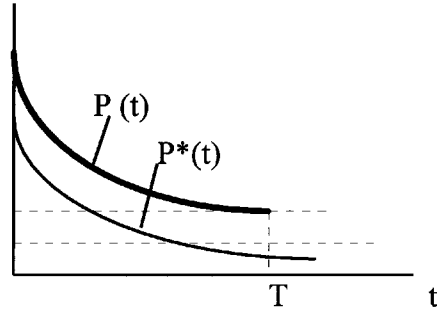
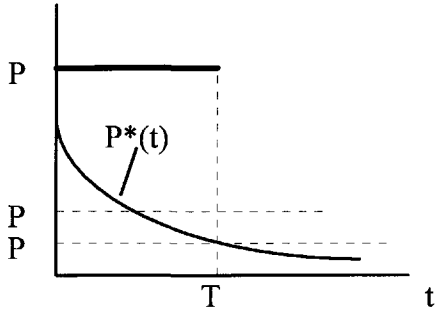
IV. Conclusion

This short note reconsidered Hillman's (1982) politically-motivated protection of declining industry in the face of import competition. Hillman suggests that permanency of protection depends on the specification of the political support function. Hillman's finding can be disturbing because the model generates conflicting results under alternative, but equally plausible assumptions. This note points out that the nonrobustness in Hillman's paper is due to the fact that he inadvertently omitted the possibility of pure consumer protection in the SPPSF specification. Once this case is explicitly accounted for, I demonstrate that temporary protection arises as a political equilibrium across specifications. This exercise is important because the plausibility of alternative specifications cannot be ascertained *a priori*. This paper, therefore, shows that Hillman's basic result of temporary protection is more general than suggested in his paper because its validity is not confined to his own specification of the political support function.

I also analyze the price dynamics and the speed of adjustment with the original SPPSF. Despite the robustness of the temporary protection result, pre-liberalization price dynamics exhibit different patterns across specifications. Introducing the partial mobility of specific inputs with convex adjustment costs into the SPPSF, however, restores the price dynamics of the Hillman specification even though the underlying mechanisms responsible for the declining domestic prices are rather different.

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