Transparency in the Foreign Exchange Market and the Volume of International Trade

by

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Abstract

In this paper we study the impact of more transparency in the foreign exchange market on the ex ante expected volume of international trade. Transparency is measured by the informational content of publicly observable signals. These signals convey information about the use of policy instruments which affect the future exchange rate. We find that more transparency may increase or decrease the volume of international trade. In particular, the impact of more transparency depends the curvature of the marginal cost function of the firms. Furthermore, ex ante expected profits of the firms are higher when the foreign exchange market is more transparent.

JEL classification: D8, D51, F21, F31

Key words: exchange rate risk, transparency, export production, futures markets.

1 Introduction

Many papers have stressed the role of uncertainty in international currency markets for the performance of the real sector of an economy and, in particular, for cross border trade flows (Cushman (1986), Kawai and Zilcha (1986), Zilcha and Eldor (1991), Gagnon (1993), Broll and Eckwert (1999), Moschini and Hennessy (2000)). These contributions study the impact of exchange rate uncertainty on international trade in a framework where distributional parameters linked to higher moments of the random future exchange rate are changed in a comparative static way. While these studies have produced a number of interesting results, they can be criticized on the grounds that the stochastic nature of the economic environment ought to be considered an exogenous structural element of the model rather than a policy tool. And it is hard to see what kind of normative conclusions or policy recommendations can be drawn from comparative static exercises focusing on shocks to parameters which are not under the control of policy institutions.

In this paper we follow a different approach. Our approach is based on the view that agents perceive exchange rate movements as random because they are imperfectly informed about the use of policy instruments affecting the exchange rate. The foreign exchange market is considered *more transparent*, if more public information is made available about the selection of policy variables and about the way these variables affect the future exchange rate.

Thus, the exchange rate uncertainty perceived by individual decision makers is not completely exogenous: the government may reduce this uncertainty by way of enhancing transparency, i.e., by making more information available about important determinants of exchange rate movements, such as the foreign exchange positions of central banks or fiscal and monetary policy rules. In our framework more transparency does *not* reduce the (ex ante) volatility of the future exchange rate per se. Instead, the (ex post) distribution of the exchange rate *after* some public information about policy variables has become available involves less uncertainty if the foreign exchange market exhibits more transparency.

We consider a model of partial equilibrium where a competitive exporting firm faces risky revenues due to a random future exchange rate. The distribution of

the exchange rate is affected by the selection of policy variables. In our framework the firm has access to a futures market for foreign exchange. The terms at which the firm can hedge the revenue risk through trade in currency futures depends on the available information about the selected policy variables. The reliability of this information serves as a measure for the degree of transparency on the foreign exchange market.

Our notion of transparency is adopted from the work by Drees and Eckwert (2003). These authors have characterized market transparency using a criterion which is conceptually related to the literature that emerged from the seminal works by Blackwell (1953), Drèze (1960) and Hirshleifer (1971;1975). According to this criterion, transparency is linked to the informativeness of an observable signal which is (imperfectly) correlated with the future exchange rate. The signal conveys some information about determinants of the unknown exchange rate and, therefore, allows the firm to update its beliefs. The uncertainty to which the firm is exposed when it decides about export production depends on the observed signal as well as on the information system within which the signal can be interpreted. We characterize the foreign exchange market as more transparent if the signal conveys more precise information about the determinants of the future spot exchange rate. Thus, higher transparency implies that exchange rate risk is reduced through the dissemination of more reliable information.

How does more transparency in the foreign exchange market affect the export volume of the international firm? The answer depends on the curvature of the firm's marginal cost function: more exchange rate transparency stimulates (reduces) export production if the *marginal* cost function is concave (convex). By contrast, expected firm profits always increase with more exchange rate transparency regardless of technological parameters and of attitudes towards risk as long as the cost function is convex.

These results differ in nature from the findings in earlier studies which have adopted a simplistic approach of modeling transparency by means of exogenous changes in the distributional parameters of the exchange rate (e.g., Franke (1991), Viaene and de Vries (1992), Broll et.al. (1995)). In such a framework the forward

exchange market is completely separated from the underlying transparency concept; hence, the well-known separation property implies that parameters affecting the volatility of the exchange rate have no impact on international trade. Yet, this approach misses out on an important link that exists between exchange rate transparency and the terms of contracting on the forward exchange market. Taking this link into account yields new insights into the implications of exchange rate transparency for international trade.[1]

The paper is organized as follows. In Section 2 we present the firm's decision problem and introduce the concept of transparency which underlies our analysis. Section 3 contains the main results: we characterize the impact of more transparency on the export volume and on the firm's expected profits; and we illustrate the central aspects of our results by means of an example. Section 4 concludes the paper.

2 Export Production and Foreign Exchange Market Transparency

We consider the model of an exporting firm which extends over two periods, $t = 0, 1$. The firm produces a homogenous good in period 0 and sells its products abroad for a given price of p_1 units of foreign currency. Production costs in domestic currency, $C(x)$, are a strictly increasing and convex function of the export volume, x. The firm's random revenues, as of date 1, in domestic currency are $\tilde{e}_1 p_1 x$, where $\tilde{e}_1$ is the one-period-ahead spot exchange rate between the domestic currency and the foreign currency. The tilde refers to the random nature of the spot exchange rate $\tilde{e}_1$ which assumes values in $E := [\underline{e}, \overline{e}]$, where $0 < \underline{e} < \overline{e} < \infty$.[2]

As of date 0, when the firm decides about production, the future exchange rate,

[1] In our framework the separation property also holds, hence the volatility of the exchange rate does not affect the forward rate. Rather, the distinctive feature of our study derives from the adoption of a more general and, we believe, more meanigful transparency concept. Unlike in the existing literature, our notion of transparency incorporates the whole distribution, and not just the volatility, of the exchange rate. The degree of transparency, therefore, interacts with the terms of contracting on the forward exchange market.

[2] We mark random variables by a tilde; we delete the tilde when referring to a *realization* of a random variable.

$\tilde{e}_1$, is random. The randomness derives from the future use of a monetary or fiscal policy instrument, $\tilde{m}$, and from a noise term (with zero mean), $\tilde{\varepsilon}$,

$$\tilde{e}_1 = \tilde{m}_1 + \tilde{\varepsilon}, \tag{1}$$

where $\tilde{m}_1 := \theta(\tilde{m})$. $\tilde{m}$ assumes values in the policy space $\Omega := [\underline{m}, \overline{m}]$. $\theta : \mathbb{R}_+ \to \mathbb{R}_+$ describes how the monetary/fiscal policy instrument, $\tilde{m}$, affects the future exchange rate.

Agents are imperfectly informed about the central bank's/government's strategy of using the monetary/fiscal policy instrument $\tilde{m}$. Therefore, from the perspective of the firm $\tilde{m}_1 = \theta(\tilde{m})$ constitutes a random variable. The central bank/government exerts some control over the distribution of $\tilde{m}_1$: it may reduce the variability (as perceived by private agents) of $\tilde{m}$ by making more information about monetary/fiscal policy objectives available to the public. The link between information about monetary/fiscal policy and the distribution of $\tilde{m}$ will be spelled out in full detail in Section 2.2.

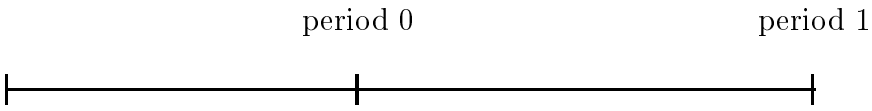
According to (1), the future exchange rate consists of two components: a random monetary/fiscal policy term, $\theta(\tilde{m})$, and a noise term $\tilde{\varepsilon}$. We assume that $\tilde{m}$ and $\tilde{\varepsilon}$ are stochastically independent. This implies, in particular, that the noise term will not be affected by information about monetary/fiscal policy $\tilde{m}$. Prior to choosing a production level, the firm observes a signal y which is provided to the public by the central bank/government. This signal is the realization of a random variable $\tilde{y}$. We assume that $\tilde{y}$ is correlated with $\tilde{m}$. The signal, therefore, contains information about the unknown monetary/fiscal policy and, hence, about the future exchange rate. Thus, at the time when the production decision is made, the relevant expectation for $\tilde{e}_1$ is the updated (in a Bayesian way) posterior belief.

The firm has access to a futures market where it can hedge the foreign exchange risk. The futures market opens at date 0 *after* the signal has been observed. A futures contract pays 1 unit of foreign currency at date 1. Hence the payoff is worth e_1 units of domestic currency. Let h be the forward commitment of the firm, i.e., h denotes the number of futures contracts sold by the firm. We assume that the terms of forward contracting are unbiased, which implies that the futures market

clears at a price $e_f(y)$ that is equal to the conditional mean of a contract's payoff,

$$e_f(y) = E[\tilde{e}_1|y]. \tag{2}$$

Both the payoff and the purchase price of the contract fall due in period 1. The timing of events is as follows (see Figure 1):



choice of	signal y is observed;	exchange rate e_1 is realized;
information	currency futures market opens;	output is produced and sold;
system	firm chooses x and h	futures contracts are settled

Figure 1

2.1 The Decision Problem of the Firm

The firm maximizes expected utility, defined over random profits, $\tilde{\Pi}$, where the product price in foreign currency is set equal to 1,

$$\tilde{\Pi} = \tilde{e}_1 x - C(x) + h(e_f(y) - \tilde{e}_1).$$

The decision maker's problem may thus be written

$$\max_{x,h} E[U(\tilde{\Pi})], \tag{3}$$

where $U : \mathbb{R} \to \mathbb{R}$ is a strictly increasing, strictly concave and twice continuously differentiable utility function. The firm maximizes (3) with respect to export production, x, and forward commitment h. The necessary first-order conditions, which are also sufficient, are

$$E[U'(\tilde{\Pi})(\tilde{e}_1 - C'(x))] = 0, \tag{4}$$

$$E[U'(\tilde{\Pi})(e_f(y) - \tilde{e}_1)] = 0. \tag{5}$$

From (4) and (5) we obtain the optimal production level and forward commitment as[3]

$$C'(x) = e_f(y) \tag{6}$$

$$h = x. \tag{7}$$

Next we define our notion of exchange rate transparency. The transparency of the foreign exchange market will be linked to the informational content of the signal y.

2.2 Information Systems and Exchange Rate Transparency

We identify the transparency of the foreign exchange market with the 'informativeness' of the signal $y \in Y$, where Y is a subset of some Euclidian space: the more information about monetary/fiscal policy and, hence, about the future exchange rate is revealed by the signal, the more transparent is the foreign exchange market. Thus, with more transparency private agents are able to base their decisions on more reliable information about the policy variable which affects the future exchange rate. In the sequel we will refer to the realizations of the policy variable, $\tilde{m}$, as the states of nature.

The informativeness of the signal depends on the information system within which signals can be interpreted. An information system, denoted by g, specifies for each state of nature, m, a conditional probability function over the set of signals: $g(y|m)$. The positive real number $g(y|m)$ defines the conditional probability (density) that the signal y will be observed if the true (yet unknown) state of nature is m. The firm knows the function $g(y|m)$ by which the signals are generated, given the state of nature. Using Bayes's rule, the firm revises its expectations and maximizes utility on the basis of the updated beliefs.

Let $\pi : \Omega \to \mathbb{R}_+$ be the (Lebesgue-) density function for the prior distribution over the policy space Ω. The density for the prior distribution over Y is given by

$$\nu(y) = \int_\Omega g(y|m)\pi(m)\,\mathrm{d}m \quad \text{for all } y. \tag{8}$$

[3](7) follows from (5) since, according to (2), the futures market is unbiased.

The density function for the updated posterior distribution over Ω is[4]

$$\nu(m|y) \quad = \quad g(y|m)\pi(m)/\nu(y). \tag{9}$$

Blackwell (1953) suggested a criterion that ranks different information systems according to their informational contents. Suppose g^1 and g^2 are two information systems with associated density functions $\nu^1(\cdot)$ and $\nu^2(\cdot)$. The following criterion induces an ordering on the set of information systems.

Definition 1 (Informativeness) *Let g^1 and g^2 be two information systems. g^1 is said to be more informative than g^2 (expressed by $g^1 \succ_{\text{inf}} g^2$), if there exists an integrable function $\lambda : Y^2 \to \mathbb{R}_+$ such that*

$$\int_Y \lambda(y', y)\, \mathrm{d}y' = 1, \tag{10}$$

holds for all y, and

$$g^2(y'|m) = \int_Y g^1(y|m)\lambda(y', y)\, \mathrm{d}y \tag{11}$$

holds for all $m \in \Omega$.

According to this criterion $g^1 \succ_{\text{inf}} g^2$, holds if g^2 can be obtained from g^1 through a process of randomization. The probability density $\lambda(y', y)$ in equation (10) transforms a signal y into a new signal y'. If the y'-values are generated in this way, the information system g^2 can be interpreted as being obtained from the information system g^1 by adding random noise. Note that $\lambda(\cdot, \cdot)$ in (11) is independent of m. Therefore, the signals under information system g^2 convey no information about the value of $\tilde{m}$ that is not also conveyed by the signals under information system g^1. As a consequence, the *a priori* perceived posterior policy uncertainty under g^1 will be lower than under g^2.

Our notion of exchange rate transparency is based on the informational content of the signals. A signal that conveys information about monetary/fiscal policy affects the exchange rate uncertainty to which the firm is exposed. We characterize

[4] To avoid notational clutter we distinguish between the functions $\nu(y)$ and $\nu(m|y)$ only by their arguments.

the foreign exchange market as more transparent if the signal, y, conveys more reliable information about the policy variable $\tilde{m}$ and, hence, about the future exchange rate, $\tilde{e}_1$. Thus, higher exchange rate transparency implies that perceived exchange rate volatility is reduced through the dissemination of more reliable information about the policy variable which affects the exchange rate.

Definition 2 (Exchange Rate Transparency) *Let g^1 and g^2 be two information systems. The foreign exchange market is said to be more transparent under g^1 than under g^2, if $g^1 \succ_{\text{inf}} g^2$.*

The following lemma contains a property of information systems that turns out to be a convenient tool for our analysis. The lemma formulates an alternative transparency criterion that is equivalent to the condition stated in Definition 2.

Lemma 1 *The foreign exchange market is more transparent under g^1 than under g^2 if and only if*

$$\int_Y F(\nu^1(\cdot|y))\nu^1(y)\,\mathrm{d}y \geq \int_Y F(\nu^2(\cdot|y))\nu^2(y)\,\mathrm{d}y$$

holds for every convex function $F(\cdot)$ on the set of density functions over Ω.

A proof of Lemma 1 can be found in Kihlstrom (1984). Note that $\nu^1(\cdot|y)$ and $\nu^2(\cdot|y)$ are the posterior beliefs under the two information systems. Thus, Lemma 1 implies that more transparency (weakly) raises the expectation of any convex function of posterior beliefs. For concave functions, F, the inequality is reversed.

According to equation (6) the export decision depends on the signal y. The signal determines the ex post distribution of the exchange rate and, hence, the forward rate. More transparency implies that the firm faces higher uncertainty from an *ex ante* point of view (before the signal has been revealed). This is due to the fact that the forward rate reacts more sensitively to changes in the signal if the signal becomes more informative. In particular, the forward rate is a constant and, consequently, ex ante uncertainty vanishes if the signal is uninformative. Also observe that the firm faces no *ex post uncertainty* (after the signal has been revealed)

due to the existence of an unbiased futures market. Thus, the degree of exchange rate transparency has no bearing on the uncertainty under which the export decision is formulated.

3 Exchange Rate Transparency and Export Volume

We now turn to the question how the export volume of the firm is affected as the foreign exchange market becomes more transparent. The export decision, x, is contingent on the signal y. We define the export volume, X, as the average export level before the signal has been observed,

$$X = E_y[x(y)] = \int_Y x(y)\nu(y)\,\mathrm{d}y \tag{12}$$

The following proposition characterizes the impact of more exchange rate transparency on the export volume in terms of the curvature of the marginal cost function.

Proposition 1 *Let g^1 and g^2 be two information systems such that the foreign exchange market is more transparent under g^1 than under g^2. The export volume of the firm is higher (lower) under g^1 than under g^2, if the marginal cost function $C'(x)$ is concave (convex).*

Proof: In view of (12) and Lemma 1, we have to show that the export decision, $x(y)$, is convex (concave) in the updated posterior belief $\nu(m|y)$ if $C'(x)$ is a concave (convex) function. By (6), $x(y)$ depends on $\nu(m|y)$ only via the forward rate $e_f(y)$. Since $e_f = E[\tilde{e}_1|y] = \int_\Omega \theta(m)\nu(m|y)\,\mathrm{d}m$ is linear in the posterior belief $\nu(m|y)$, the export decision $x(y)$ will be convex (concave) in $\nu(m|y)$ if it is convex (concave) in $e_f(y)$. Obviously, $x(y) = (C')^{-1}(e_f(y))$ is convex (concave) in $e_f(y)$ if C' is a concave (convex) function. The proof is complete. □

According to Proposition 1, the role of more transparency on the foreign exchange market for the export volume depends only on the curvature of the marginal cost function.[5] In particular, under the standard specification of decreasing returns

[5]Convexity of the marginal cost function is a pattern often seen in agriculture and in manufacturing where the presence of some fixed input factors (land, building of fixed size) eventually

to scale, more exchange rate transparency may stimulate or depress international trade. If the cost function is quadratic and, hence, the marginal cost function is linear, the export volume will not be affected by more transparency in the foreign exchange market.

To illustrate this result, consider the extreme cases where g^1 is fully informative and g^2 is uninformative. Under the information system g^2, the signal y does not reveal any information about $\tilde{m}$. Thus, the forward rate is equal to the unconditional expectation $\bar{e}_1 := E[\tilde{e}_1] = E[\theta(\tilde{m})]$, and

$$X_{g^2} = (C')^{-1}\big(E[\theta(\tilde{m})]\big). \tag{13}$$

By contrast, under the information system g^1, the signal reveals the future policy m and, hence, the forward rate is equal to $\theta(m)$. In this case, (6) reduces to $C'(x) = \theta(m)$ which implies

$$X_{g^1} = E\big[(C')^{-1}\big(\theta(\tilde{m})\big)\big]. \tag{14}$$

Using Jensen's inequality, (13) and (14) imply $X_{g^1} \overset{(\leq)}{\geq} X_{g^2}$ if $(C')^{-1}$ is convex (concave).

The result in Proposition 1 differs markedly from the role attributed to exchange rate transparency in earlier studies (e.g., Viaene and de Vries (1992), Broll et.al.(1995)). These studies have modeled lower transparency in the foreign exchange market simply by means of an exogenous mean preserving spread (MPS) of the random exchange rate. A MPS has no impact on the terms of contracting on the forward exchange market. Therefore, referring to the separation property according to which the forward exchange rate determines the export volume, those earlier studies have concluded that exchange rate transparency does not affect international trade. By contrast, our approach implies that higher exchange rate transparency affects the forward exchange rate – and, hence, the firm's exports – through the additional information conveyed by the signals about policy variables affecting the future exchange rate. The endogenous terms of forward contracting,

constrains production. By contrast, production processes that exhibit high substitutability among input factors may give rise to concave marginal cost functions.

therefore, constitutes an important link through which exchange rate transparency may affect international trade.

Proposition 1 might explain why the empirical evidence regarding the effect of exchange rate randomness on the volume of international trade has so far been inconclusive (Cushman (1988), Giavazzi and Giovannini (1989), Stein (1991), McKenzie (1999)): countries that differ with respect to their technologies for export production in the sense of Proposition 1 should be expected to exhibit opposing links between (ex post) exchange rate uncertainty and export volume.

Proposition 2 *Let g^1 and g^2 be two information systems such that the foreign exchange market is more transparent under g^1 than under g^2. Expected firm profits*

$$E(\tilde{\Pi}) = \int_Y \Pi(y)\nu(y)\,\mathrm{d}y \tag{15}$$

are higher under g^1 than under g^2.

Proof: Proceeding along the same lines as in the proof of Proposition 1 we need to show that

$$\Pi(y) = e_f(y)(C')^{-1}(e_f(y)) - C\Big((C')^{-1}\big(e_f(y)\big)\Big) \tag{16}$$

is a convex function of $e_f(y)$. Differentiating (16) with respect to $e_f(y)$ and using (6) yields

$$\frac{\partial \Pi(y)}{\partial e_f(y)} = (C')^{-1}\big(e_f(y)\big). \tag{17}$$

The convexity of the cost function implies that $(C')^{-1}(\cdot)$ is monotone increasing. Therefore, (17) yields the convexity of the profit function in the forward rate $e_f(y)$. □

According to Proposition 2, expected firm profits increase with more exchange rate transparency regardless of attitudes towards risk and of technological parameters, as long as the cost function is convex. This result does not imply, however, that the firm will be better off – in terms of ex ante expected utility – if the foreign exchange market becomes more transparent. When the signal affects an insurable risk, like in our model, the effect of better information on ex ante expected utility

depends on two opposing mechanisms. Firstly, when the firm receives more reliable information it is able to improve its decision, thereby increasing ex ante expected utility (Blackwell-effect). Secondly, as was pointed out by Hirshleifer (1971,1975), better information may interfere with the operation of risk sharing markets thereby destroying some risk sharing opportunities. Since the firm is risk-averse, ex ante expected utility declines. Due to these opposing effects the overall impact of more exchange rate transparency on the firm's welfare is ambiguous.[6]

3.1 An Example

We illustrate the result in Proposition 1 for a simple example economy. Suppose that the policy variable, $\tilde{m}_1$, in equation (1) takes the form

$$\tilde{m}_1 = a + \tilde{y}_1 + \tilde{y}_2, \tag{18}$$

where $a > 0$ and $\tilde{y} = (\tilde{y}_1, \tilde{y}_2)$ denotes a vector of policy instruments. Assume that the random variables $\tilde{y}_1$ and $\tilde{y}_2$ are stochastically independent and normalized such that $E[\tilde{y}_1] = E[\tilde{y}_2] = 0$.

We consider two information systems g^1 and g^2. Under g^2 the firm can observe only the realization of the policy instrument $\tilde{y}_1$, while under g^1 both policy instruments, $\tilde{y}_1$ and $\tilde{y}_2$, are observable. Clearly, $g^1 \succ_{\text{inf}} g^2$ and, hence, under g^1 the foreign exchange market is more transparent than under g^2.

From (1) and (2) we get

$$e_f^1(y) = a + y_1 + y_2 \tag{19}$$

$$e_f^2(y) = a + y_1, \tag{20}$$

and, hence,

$$x^1(y) = (C')^{-1}(a + y_1 + y_2) \tag{21}$$

$$x^2(y) = (C')^{-1}(a + y_1). \tag{22}$$

[6] In a different framework, the interaction between the Blackwell-effect and the Hirshleifer-effect has been studied in some recent papers by Schlee (2001), Drees and Eckwert (2003), and Eckwert and Zilcha (2001,2003).

Observe that the random variable $x^1(\tilde{y})$ is more dispersed then $x^2(\tilde{y})$. This is because the firm's export decision reacts more sensitively to changes in the signal if the signal is more reliable, i.e., if the foreign exchange market is more transparent.

(21) and (22) imply

$$X^1 = E\big[(C')^{-1}(a+\tilde{y}_1+\tilde{y}_2)\big] \overset{(\leq)}{\geq} E\big[(C')^{-1}(a+\tilde{y}_1)\big] = X^2 \tag{23}$$

if the inverse of the marginal cost function, $(C')^{-1}$, is convex (concave). The inequality in (23) follows from the fact that $a+\tilde{y}_1+\tilde{y}_2$ is a MPS of $a+\tilde{y}_1$ (see Rothschild and Stiglitz (1970)).

Expected profits under the two information systems satisfy

$$\begin{aligned} E(\tilde{\Pi}^1) &= E\big[\tilde{x}_1(C')^{-1}(\tilde{x}_1) - C\big((C')^{-1}(\tilde{x}_1)\big)\big] \\ &\geq E\big[\tilde{x}_2(C')^{-1}(\tilde{x}_2) - C\big((C')^{-1}(\tilde{x}_2)\big)\big] = E(\tilde{\Pi}^2), \end{aligned} \tag{24}$$

where $\tilde{x}_1 := a+\tilde{y}_1+\tilde{y}_2$, $\tilde{x}_2 := a+\tilde{y}_1$.The inequality holds because $\tilde{x}_1$ is a MPS of $\tilde{x}_2$ and $x(C')^{-1}(x) - C\big((C')^{-1}(x)\big)$ is convex as a function of x (see (17)).

4 Concluding Remarks

In this paper we have studied the role of transparency in the foreign exchange market for the export volume and expected profits of a competitive international firm. Exchange rate transparency was defined in terms of the informativeness of a signal that conveys some information about the use of policy instruments which affect the future spot exchange rate. The export volume and expected firm profits were defined by means of the ex ante expected values for export production and profits. Our analysis has produced two main results: more transparency in the foreign exchange market increases expected firm profits, but does not necessarily stimulate the export volume. If the firm's marginal cost function is concave (convex), more exchange rate transparency leads to a higher (lower) export volume.

We have conducted our analysis in a partial equilibrium setting. Therefore the results must be interpreted with care if, as is often done in the literature on the exporting behavior of international firms, export volume is taken as a proxy for the

volume of international trade. Yet, it is possible, in principle, to embed our model into a general equilibrium approach along the lines in Broll and Eckwert (1998). The key mechanisms that produce the results in this paper would equally apply in such a general equilibrium model. This observation may justify an interpretation of our findings in terms of a link between exchange rate transparency and the volume of international trade.

In deriving our results we have assumed that a futures market for foreign currency exists. In less developed economies where firms cannot use such risk sharing tools, the role of exchange rate transparency for profits and export volumes may be different. It is well known that an exporting firm may react quite differently to changes in risk exposure under various market structures (Wong (2001,2002)). The importance of the market structure for the mechanisms discussed in this paper will be the topic of future research.

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