Turkey: Export Miracle or Accounting Trick?

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Was Turkey's recovery from debt crisis an export miracle, as
some contend? A consequence of its proximity to the Middle
East? Or just an accounting trick — the result of a shift from
underinvoicing to overinvoicing? Or a response to sound export
incentives and exchange rate policy?

This paper is a product of the Country Operations Division, Latin America and the Caribbean Regional Office, Country Department II. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Margaret Stroude, room I8-163, extension 38831 (15 pages with figures).

Alone among major debtor countries, Turkey substantially lowered its debt-export ratio — by more than a third between 1980 and 1987. But the driving force behind the Turkish export miracle — indeed, its very existence — have been a matter of debate.

Some contend that Turkey's export boom had little to do with export incentives or exchange rate policy but was mostly a consequence of Turkey's proximity to the Middle East. Others claim that export growth reflected a shift from underinvoicing before 1980 toward overinvoicing afterward — a product of accounting tricks in response to changing incentives to be truthful about export receipts.

If what happened to Turkey is spillover from its proximity to the Middle East, there is little other countries can learn from the experience. And if export subsidies were behind Turkey's export growth, are GATT and free trade maybe being overpromoted? What pulled Turkey out of debt?

Using an econometric model, Arslan and van Wijnbergen assessed the contributions of various factors to the Turkish export miracle, whose existence they confirm.

Surprisingly, they learn that import growth in the Middle East made a negative contribution to Turkey's 1980-87 export boom. And although there was a switch from underinvoicing to overinvoicing, this accounting trick was nowhere near enough to explain the export miracle.

After extraneous factors such as the oil boom in the Middle East are accounted for, Turkey's export miracle was more than a response to explicit export incentives. It was a result of macroeconomic policies and trade reform that allowed a steady real depreciation of the Turkish lira.

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Table of Contents

1   Introduction

Turkey's recovery from its debt crisis in 78-80 has ever since made it the paragon of export led growth. In striking contrast to the Latin American experience after 1982, Turkish growth recovered rapidly, with exports leading the way. Alone among the major debtor countries, Turkey substantially lowered its debt export ratio, by more than a third between 1980 and 1987. Real export growth rates were close to those obtained in for example South Korea in the late sixties and seventies.

But the driving force behind the Turkish export miracle, and in fact its very existence, have remained a matter of debate. Some have pointed to Turkey's liberal provision of export incentives. Others have focused on the set of macroeconomic and import liberalization policies that caused Turkey's agressive nominal exchange rate policy to actually produce sustained real depreciation (Anand et alii (1988)).

A much more skeptical view has been expressed by Celasun and Rodrik (1987) and Rodrik (1988). They argue that not more than 30% of the increase in exports can be traced to the real depreciation of the TL, and find little empirical support for any effect of the export incentives. They conclude that Turkey's export boom had little to do with the incentive regime or exchange rate policy, but was mostly a consequence of Turkey's proximity to the Middle East. The fact that recorded data show rapid export growth to the OECD countries too is, they argue, a consequence of a shift from underinvoicing before 1980 towards overinvoicing after 1980. This shift in invoicing strategy was, they agree, a response to exchange rate and export incentive policies, as black market premia fell and export subsidies rose. Thus these policies produced, to some extent, a chimera of export growth, a shift from unofficial to official exports, with no real underlying increases in excess of what could simply be explained by the high growth rate of imports into Iran and Iraq.

The importance of this issue goes much beyond the merely academic. There is a persistent belief among some observers (for example Balassa (1978,1985)) that agressive export policies promote growth, a practitioner's view that has recently begun to gather theoretical support (Romer (1989)). Moreover, almost every study of creditworthiness has shown the importance of debt export ratios in creditors' assessment of sovereign risk (McFadden et alii (1988)). But if exports play such an important role, the policies that lead to high export growth are of substantial interest. If all that happened in Turkey was a favorable spillover of its proximity to the Middle East, there is little other countries can learn from the Turkish experience. If on the other hand, active export subsidies were the main determinants of Turkey's export growth, one should wonder about the costs of joining GATT, and whether the static efficiency gains of free trade have not been promoted too much by its adherents (World Bank and IMF, to mention some). The third explanation, real exchange rate depreciation, would put the focus much more on the macroeconomic policies and trade reforms that made such a depreciation, where actively pursued through nominal exchange rate policy, sustainable in real terms.

Thus the rationale for what we pursue in this paper; an assessment of the relative contributions of all the factors mentioned sofar to Turkey's export growth. Our effort starts with an assessment of whether there was, in fact, an export miracle once the Middle East is discounted; or was it all a product of accounting tricks in response to changing incentives to be truthful about the true extent of export receipts. In Section 2 we compare Turkey's

trade statistics with those reported by its main trading partners to assess whether there was in fact significant growth to countries outside the Middle East. We then present a simple model focusing on the role of export incentives, relative prices and foreign income growth in export determination. This model is estimated econometrically and then used for an assessment of the contributions of the various factors mentioned to the Turkish export miracle, a miracle, by the way, the existence of which we do confirm.

2   Export Incentives and Export Performance

2.1   Export Developments in Turkey.

Since 1980, Turkey's trade strategy has shifted from interventionist import substitution towards a more market-based outward orientation. Export growth over the same period has been impressive. In volume terms growth averaged 24 percent per annum. As overall exports expanded, the structure of exports changed drastically too, both in terms of commodity composition, and markets reached.

Industrial exports grew spectacularly during 1980-1987, from $ 1.0 billion in 1980 to $ 8.1 billion in 1987. Industrial exports, which in 1980 represented 36 percent of total Turkish exports, had more than doubled their share by 1987. But agricultural exports remained at the same level in value, with their share in total exports falling from 57 percent to 18.2 percent.

The pattern of exports markets has also changed very rapidly, with the Middle Eastern Countries taking an increasing share (cf figure 1). Exports to Oil-exporting Countries (RXO in Fig.1) jumped from $ 0.4 billion (13.8 percent of total exports) to $ 2.9 billion (36.4 percent of total exports) in 1985. Iran and Iraq have become Turkey's major export markets, mainly because of Turkish exporters easy access to these markets, although supply factors too must have played a role. [1]/ However since then exports to oil-exporting countries have stagnated, as falling oil prices forced these countries to curtail their expenditure (cf Fig. 1).

However Turkish export growth was much more than a spill-over from the Middle East, triggered by buoyant OPEC expenditure. Turkish exports to other countries, mostly the major OECD Countries, grew at an equally impressive rate of 17.5 percent per year on average (again, in volume terms). Exports to the OECD Countries expanded in both labor-intensive industries (such as textile and apparel) and specialized products (mostly specialized industrial and electrical machinery). Low value added exports consisting mostly of raw materials (such as processed food), diminished in importance. Exports of textiles, leather products, chemicals, machinery, electrical equipment expanded at a higher growth rate than the average of total exports. Textiles and leather products remain the largest exporting industries, while the iron and steel industry has emerged as the second most important export industry.

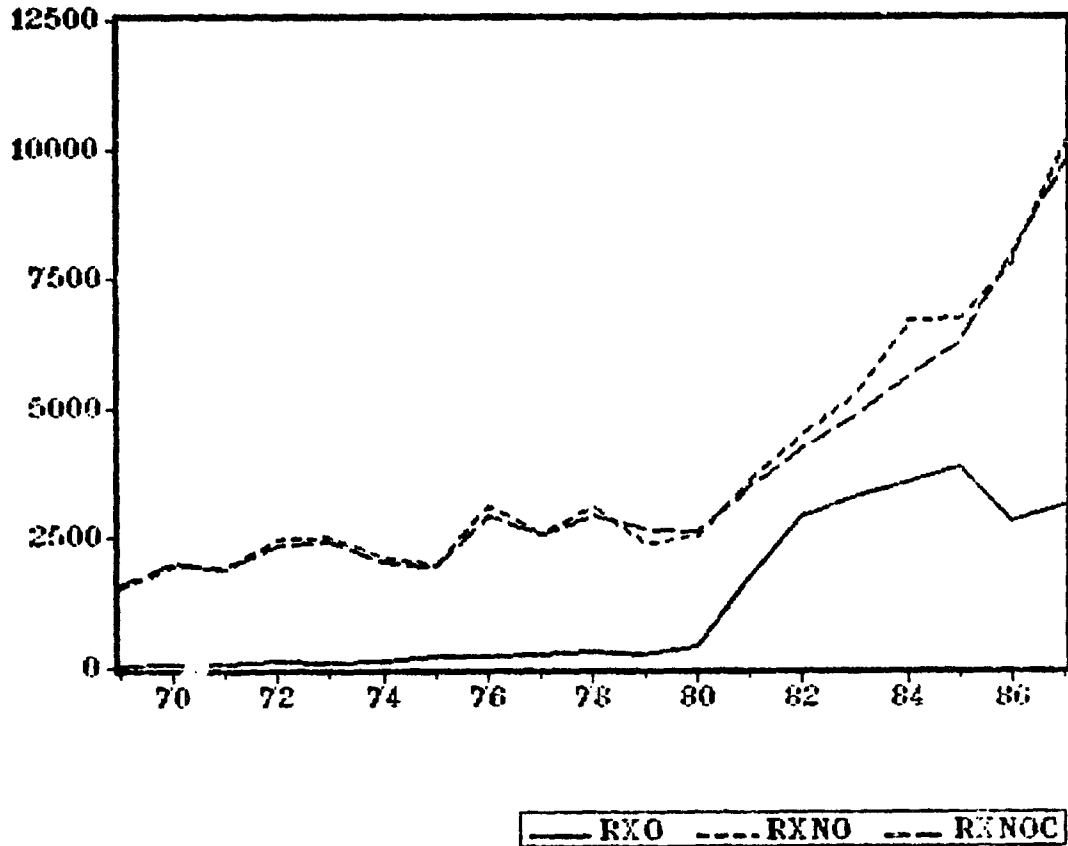[1]   The economic boom in the Middle East started well before 1980.

Figure 1: Turkey's exports (volume) to oil and non-oil countries;
RXO : exports to oil exporting countries
RXNO : exports to non-oil countries, Turkish data
RXNOC: exports to non-oil countries, trading partners' data

To what extent are all these wonderful export growth rates a chimera, a product of over-invoicing and straight fictitious exports? There is a widely shared view that the Turkish export boom has been at least partly fictitious. There is in fact no doubt that the generosity of subsidies on in particular manufacturing exports has led many exporters to over-invoice exports. But this is not the whole story. There has also been under-invoicing in some periods, because of a black market premium on foreign exchange. In order to capture this premium, the Turkish exporters would have to underreport their export revenues.

In this section, we present an estimate of the magnitude of over and under-invoicing during the 1970-87 period. The analysis is based on an

examination of partner-country data. [2]/ Turkish exports are recorded both by the Turkish authorities and by the importing country, so one has two sets of statistical records with regard to Turkey's exports. Apart from transport and insurance cost, it is reasonable to expect that export value recorded at the port of shipment will exceed the import value recorded at the port of entry whenever export over-invoicing takes place. There is no reason to expect over-invoicing by foreign importers; after all they do not receive the export subsidies, and might have to pay higher tariffs if they would over-invoice.

Before comparing Turkish statistics to corresponding trading partner trade data for an assessment of the extent of over- and under-invoicing, one adjustment needs to be made. As imports statistics are recorded on a c.i.f basis while export statistics are recorded f.o.b, the two sets of numbers are not directly comparable. To make this data comparable, we take c.i.f/ f.o.b factors from the International Financial Statistics (IMF) for Turkey's nine major trading partners in the OECD. Celasun and Rodrik (1988) (who use an across the board 8% correction factor) apply another correction; they lag trading partner data by no less than three months to correct for the time spent in transport. This would seem excessive given Turkey's proximity to its main trading partners, Germany and Italy. Since no higher frequency data are available than quarterly data, we go to the other extreme and make no adjustment for this lag. This would seem more appropriate, since transport to these countries takes at most a few days. Overestimating the time spent in transport leads to a strong upward bias in the estimate of overinvoicing in the post 1980 period since exports were growing so rapidly.

Figure 1 summarizes the results of the exercise for the period between 1969 and 1987. RXNO corresponds to exports to non-oil countries based on Turkish data while RXNOC corrects for the difference between the records in Turkey's main 9 OECD trading partners and the Turkish records on exports to these countries. Especially in the late 1970s, exports to the OECD have been subject to under-invoicing, presumably because of the much higher black market premium in that period (cf Fig. 1;). But starting in 1981, there is over-invoicing. It reached its peak in 1984, at 28 percent. The subsequent decline in over-invoicing corresponds to the period in which export subsidies were reduced. In 1987 however, over-invoicing has gone up again, because of the introduction of large subsidies in late 1986.

But altogether the conclusion should be clear from Fig.1: the partner-country data comparisons reveal some over- and under-invoicing, but really not to a substantial extent. The "corrected" figures still show a very sharp increase in exports to the OECD. Thus the Turkish export boom is for real.

There are several factors which have contributed to the Turkish export boom since 1980. Outward-oriented growth policy, the sustained real depreciation, export subsidies, and very favorable market conditions in the Middle East, at least until 1984, have all played a role. Real exchange rate depreciation and the boom in the oil countries have been brought up already; we therefore turn immediately to the export incentive regime below, in Section 2.2.

2.2   Export Incentives

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[2]   The source of the data is the Directions of Trade Statistics data tape compiled by the IMF.

Many Turkish exports qualify for as many as five export incentive regimes. First, for many sectors a deduction equal to 20 percent of export earnings is allowed in calculating taxable income, provided total annual exports exceed US$250,000. In addition to exports of manufactured goods, the 20 percent export allowance is also available for exports of fresh fruits, vegetables and seafood, international transportation earnings; certain tourist income; and construction, repairs, and technical services performed abroad. An export allowance of 5 percent is avr'lable for traders-exporters who are not the producers of the exported goods.

A further export subsidy is provided in the guise of a drawback of indirect taxes borne in the course of manufacturing in Turkey. Rebates are provided at rates that originally ranged from 2-1/2 percent to 20 percent. Assignment of products to one of several lists (originally 9 lists i.e., one for each rate of 20, 17-1/2...and 0) is specified in an official list that ostensibly depends on determination of the indirect tax content in various commodities. However in 1986 the rates have been scaled down to only 49 percent of their original levels. In addition, many items on the list have been shifted from higher to lower rate categories, and some rebates were eliminated, such as the one on textiles. The rebates were eliminated ogether at the end of 1988.

Large exporters benefit from a global drawback based on annual total qualifying earnings of net foreign currency. Turkish law makes provision for export companies that, by concentrating total exports of smaller producers into one unit, can benefit from the maximum export rebate.

A third export subsidy is given through favored foreign exchange allocation and duty-free imports. Exporters who hold export encouragement certificates can apply to get foreign exchange for their import needs and/or receive the right to duty-free imports. These duty-free imports are limited to between 40 to 60 percent of the amount exported. In addition to this, whenever there is black market premium over official exchange rate, exporters would benefit by having direct access to foreign exchange at the offical rate.

Fourth, in addition to all this, extra-budgetary funds provide further export subsidies. The Resource Utilization Support Fund (RUSF) provided export subsidies at a rate of 2 percent (down from 4 percent) of gross exports earnings, without adjustment for domestic content. But export subsidies from the RUSF were discontinued in November 1986. However, in January 1987 the Support and Price Stabilization Fund (SPSF) started providing export subsidies to several commodities on the basis of volume, not value, of exports. This change should eliminate the incentive for over-invoicing of exports that was embedded in the earlier system of value-based incentives.

Finally, the fifth and last incentive category consists of export credits, extended at interest rates below prevailing market lending rates. Under the export credit rediscount scheme, exporters holding certificates and reaching minimum levels of exports are entitled to obtain preferential credit for up to 25 percent of their export commitment. The interest rate for such credit is 38 percent, far below market lending rates over the entire period under consideration.

The measure of export subsidies used in the econometric analysis below incorporates the last four categories of subsidies given, all converted into ad-valorem equivalents. However the first subsidy category, deductions from taxable corporate income, has not been included; it is difficult to convert

into a general measure, as its value depends on the tax situation of each
individual firm.

3   Structure of the Model and Estimation Results

The model presented below focuses on the interplay between export
incentives, the real exchange rate and foreign factors influencing demand for
Turkish goods. The emphasis is on three major decisions, two by Turkish
entrepreneurs and one by potential foreign consumers of Turkish goods, and the
way policy influences those decisions. First, how does the incentive to sell
at home rather than abroad depend on relative prices of home and export goods,
inclusive of export incentives? Second, of what entrepreneurs decide to sell
abroad for any given relative price structure, how much is reported so as to
collect on export subsidies, and how much goes unreported so as to exploit any
difference between black market and official exchange rates? Third, for given
relative price of Turkish exports and competitors' output, how do foreign
consumers allocate their expenditure? How does that decision change when
relative prices do?

We assume that the relative price of exports moves so as to reconcile
the resulting aggregrate supply of Turkish exports, reported or unreported,
with aggregate foreign demand for Turkish goods. We keep exogenous both
foreign prices, summarized as P^*, and the price of Turkish goods sold at home,
P. We will refer to $P/(EP^*)$ as the real exchange rate e. P_x is the absolute
price of exports. The relative price of Turkish exports can thus be defined in
two different ways; with respect to foreign goods, $p_{x*} = P_x/(EP^*)$, or with
respect to home goods: $p_{xh} = P_x/P$. [3]/ These two relative prices are linked
through the real exchange rate: $p_{x*} = p_{xh}$ e.

Endogenizing export prices allows us to address the important question
of which way export incentives are shifted, backwards to domestic entre-
preneurs or forward to foreign consumers? The answer to this question is an
important input in any assessment of the welfare impact of export subsidies.
At the same time, maintaining the real exchange rate exogenous, i.e.
determined outside the model, allows us to escape introducing a full-blown
general equilibrium model of the Turkish economy. The use of such a full blown
GE model would have made it all but impossible to use only fully estimated
relationships, something we consider essential.

3.1 Model Structure

Assume there is one good produced in Turkey, y, which can either be
exported or sold at home. The home price is P, and the unit benefit of
exporting equals π_x. π_x may differ from P_x because of export subsidies or
exchange market arbitrage with the black market in ways to be defined below.
We assume rising marginal production costs (expressed in terms of home goods):

(1) $c = c(y)$, $c' > 0$, $c'' > 0$.

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[3] We use capital letters for absolute prices and lower case letters for
relative prices.

If goods are sold at home there are no further distribution costs. If goods
are exported, additional costs are incurred depending on how far away from the
harbor firms are located. For given location, we assume fixed unit shipping
costs $s_x(1)$, with 1 an index of distance from the harbor. $s_x(1)$ is also
expressed in terms of home goods. We assume a continuous distribution of firms
over the index 1 and unit shipping costs that increase smoothly with distance.
        Each firm maximizes profits:

(2) $\max_x (y(1)-x(1))) + (\pi_x/P-s_x(1))x(1)-c(y(1))$ s.t $0 \leq x \leq y$

The first order condition for y(1) ties down each firm's total output:

(3) $c'(y(1))=1$

As to exports,

(4) $x(1) = y(1)$ if $(\pi_x-s_x(1)) \geq c'$

        0   if $(\pi_x-s_x(1)) < c'$

In fact, firms are indifferent between exporting and selling at home in the
case of an equality. We simply assume that a tie results in exports. This is
of no consequence because it happens at only one support point in a continuous
distribution. (4) yields, after aggregration, an aggregrate export supply
function:

(5) $x/y = f(\pi_x/P)$

        Consider next the decision to report exports or not. In practice
unreported exports can take different forms and can be positive or negative.
Positive unreported exports result from underinvoicing or downright smuggling
out. Negative unreported exports can result from overinvoicing or, in
extremis, from reporting exports that in fact never took place (fictitious
exports). Both phenomena have been widely reported in response to Turkish
export incentives. Fictitious exports are particularly easy to implement for
exports to countries with large contingents of Turkish workers such as West
Germany, Switzerland or the Netherlands because of often close personal
relations between exporter and importer.
        We adopt a stylized model in line with some similarity to the smuggling
literature (Pitt (1981), Martin and Panagarya (1984)). Reporting exports
implies eligibility for export subsidies s (defined as ad valorem subsidies);
against this plus point is the minus point of foregoing the opportunity of
exchanging foreign currency receipts at the more favorable black market rate.
Define the black market premium (the black market rate over the official rate,
minus one) as ϕ. Revenues from exporting are:

(6a) $\pi_x x = P_x(1+xs)x_o + P_x(1+\phi)(x-x_o)$

where x_o represents reported exports.

We assume that the chance of being caught increases with the share of exports going unreported, and that a penalty proportional to sales is imposed once an exporter is caught. Thus revenue net of expected penalties are:

(6b) $P_x(1+xs)x_o + P_x(1+\phi)(x-x_o) - P_x x\gamma(x_o/x)$, $\gamma'<0$.

Maximizing (6b) with respect to x_o for given total volume exported thus leads to a simple expression for the share of exports reported:

(7) $x_o/x = g((1+xs)/(1+\phi))$

Note thay due to overinvoicing and fictitious exports, the expression in (7) can exceed one. (5) and (7) together fully determine supply of Turkish exports and the degree of overinvoicing, underinvoicing or faking export receipts altogether.

Finally demand for Turkish goods abroad. We assume foreigners have a nested CES utility function, with aggregrate foreign and home goods in level one and the foreign good split up over Turkish goods and other imported goods in level 2 (cf Kharas (1989) for a similar approach). This leads to standard demand functions:

(8a) $M_*/A^* = h(P_{h*}/P_{M*},A^*)$,

(8b) $x_d/M^* = k(P_x/P_{M*},M^*)$

Inserting (8b) into (8a) and taking log-differences yields one of the two specifications used below:

(9) $dlog(x_d) = \alpha_0 + \alpha_1 dlog(p_x/p_{M*}) + \alpha_2\gamma_1 dlog(P_{h*}/P_{M*}) + \alpha_2\gamma_2 dlog(A^*)$

α_i are the elasticities corresponding to (8b) and γ_i the elasticities of equation (8a). "dlog' refers to logdifferences: $dlog(x)=log(x)-log(x(-1))$. The other specification used is (8b) directly.

Market clearing requires (10) to hold:

(10) $x = x_d$

(10) determines an equilibrium value of P_x for given values of P, P_{M*} and so on.

3.2   Econometric Results

All equations are estimated using TSLS. The instruments used are listed in the appendix. Consider first the export supply equation:

(11) $log(x/y) = 2.38 + 0.96*log(rpxy) + 0.81*log(rpxy(-1))$
            (5.26) (2.95)   (.76)

            $+ 0.66*log(rpxy(-2)) + 0.51*log(rpxy(-3))$
             (3.86)   (1.56)

$R^2 = 0.68$, TSLS, SMPL $= 72-89$

where rpxy=P_x(1+xs)/P. The equation shows a very strong supply response to relative prices (inclusive of export subsidies). No good results were obtained with inclusion of the black market premium; the smuggled part of total exports is apparently too small for this variable to show up significantly although it should be part of π_x. Note that x is total Turkish exports measured from foreign trade statistics where available (see the data appendix for details). This equation is estimated on a subset of 9 countries because of limited availability of counterpart trade data. In particular the Middle East had to be excluded, but the nine largest trading partners outside the Middle East were in the sample (see data appendix for details). Note incidentally that x_o/x can exceed 1.

(12) log(x_o/x) = 0.05 + 0.30*log((1+xs)/(1+ϕ))
              (3.11) (3.88)

R^2 = 0.44, DW = 1.79, OLS, SMPL = 67-87

Not surprisingly there is a substantial residue of unexplained variance, but one thing is clear. The share of total exports that is actually reported and thus shows up in the Turkish trade statistics is highly sensitive to the relative attractiveness of reporting versus not reporting as determined by subsidies and the black market exchange rate premium.

As to export demand, we looked separately at exports to oil exporting countries (x_o) and exports to other countries (x_{no}). Consider the latter first. Analysis of the error structure of the equation showed that first differencing was necessary for stationarity (auto correlation coefficients below one). Estimation of equation (9) yields the following results:

(13a) dlog(x_{no}) = 0.03 + 0.83*dlog(P_x/(EP$_{M*}$)) + 0.33*dlog(P_x(-1)/(EP$_{M*}$(-1)))
          (0.42) (1.61)   (0.68)

        + 0.27*dlog(P_{h*}/P_{M*}) + 1.32*dlog(A*)
        (0.26)   (0.66)

R^2 = 0.31, TSLS, SMPL = 71-87

The equation performs rather poorly as specified; in particular the terms involving substitution on the first level (home versus foreign goods in the country exported to) come up with very insignificant parameter estimates. We therefore reestimated the equation on the second level only, focusing exclusively on competition between Turkish exports and other exports to Turkey's export markets. This yields better results:

(13b) dlog(x_{no}) = - 0.01 + 1.15*dlog(P_x/(EP$_{M*}$))
              (0.18) (2.48)

        + 0.26*dlog(P_x(-1)/(E(-1)P_{M*}(-1))) + 1.50*dlog(M*)
        (0.64)   (2.45)

R^2 = 0.43, TSLS, SMPL = 69-87

Equation 13 shows a significant and moderately high price elasticity and a significant and high income elasticity.

The same equation for exports to oil exporting countries yields results that may come as a surprise:

$$(14) \quad \log(x_o) = -10.2 + 7.73*\log(P_x/(EP_{Mo*}) + 1.36*\log(M_{o*})$$
$$\qquad\qquad (2.35) \; (4.46) \qquad\qquad\quad (3.48)$$

$R^2 = 0.78$, TSLS, SMPL = 67-87

The equation shows a moderate income elasticity (with respect to overall imports into the Middle East) but an extremely high price elasticity. Contrary to folklore, these markets seem extremely competitive.

4   What was behind the Turkey export Miracle?

In this Section, we use the model to assess the relation between the real exchange rate, exports and competitiveness and address the question of the incidence of export subsidies. Do they mostly accrue to exporters or to foreign consumers? We then use the model to assess the relative contribution to the Turkish export miracle of the real exchange rate (really shorthand for the macroeconomic policies that supported the time path for the real exchange rate), of foreign variables, and of the export incentive system.

4.1   Export Subsidies, the Real Exchange Rate and External Competitiveness.

In the first experiment, we implement a 20 percentage points export subsidy xs. An important question is, to whom the subsidy accrues; is it shifted forward to benefit foreigners or does it go into increased profit margins of exporters? With perfectly elastic supply, higher ex ante profits for exporters will lead producers to shift into exporting until profits are baxck down, shifting the entire benefit to foreign consumers as long as there is a finite price elasticity of demand. Without any supply elasticity (or more generally with a supply elasticity below the demand elasticity) most of the subsidy will be translated in higher profits for producers ratehr than lower prices for foreign consumers. Fig. 2 shows the answer for Turkey using the model developed before.

The middle graph, RPXYF, shows the export price (expressed in terms of home goods) in the base run, without subsidy. The lines above and below rpxyf represent respectively the equilibrium producer (PXPROD) and (foreign) consumer price (PXCONS) once the twenty percent subsidy is implemented. With complete forward shifting, towards foreign consumers, PXPROD and RPXYF would coincide, with the full 20% benefit accruing to foreign consumers. In that case PXCONS would consistently lie 20% below the pre-subsidy price RPXYF. With complete backward shifting, all subsidies would accrue to domestic producers. There would thus be no decline in foreign consumer prices. PXCONS and RPXYF would coincide and PXPROD would consistently lie 20% above RPXYPF.
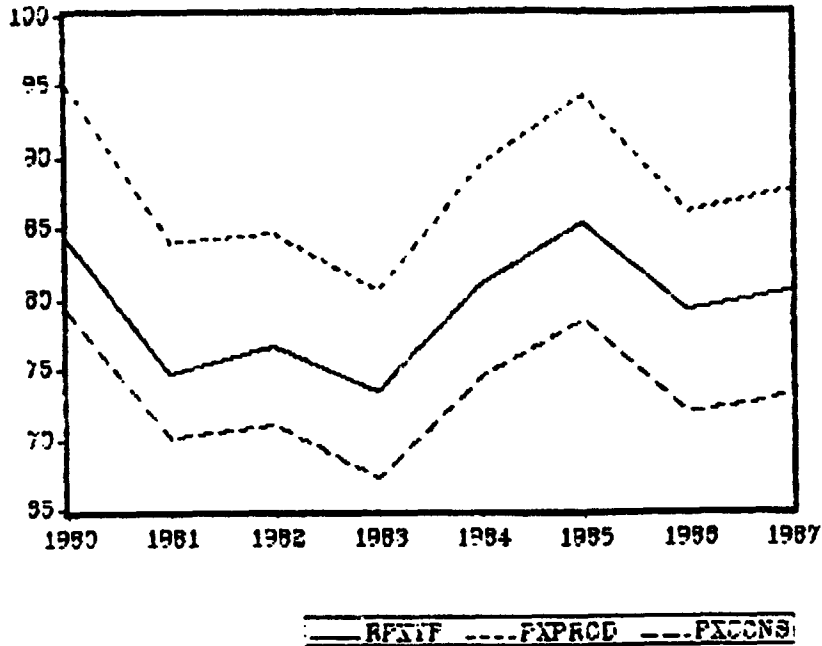
Figure 2: RPXYF: relative price of exports to home goods before imposition of export subsidies.

XPXPROD: Producer price of exports, in terms of home goods and after imposition of a 20% ad valorem export subsidy.

XPXPROD: (Foreign) consumer price of exports, in terms of home goods and after imposition of a 20% ad valorem export subsidy.

The figure demonstrates that the subsidy is mostly shifted backward to producers for most of the simulation period. Initially more than two thirds of the subsidy goes into increased profit margins, a percentage that after seven years still stands at a little under fifty percent. There is, however, a significant effect on fictitious exports and overinvoicing: the ratio of reported over actual exports goes up by no less than 5 percentage points on average, making for a much stronger response of recorded than of actual exports. Thus the conclusion that export subsidies, in spite of an apparent effect on recorded exports, are not a very effective tool to increase export volumes; most of the benefits accrue for many years to home producers rather than to foreign producers.

Consider next a change in the relative price of home goods in terms of imported goods, what we have referred to as the real exchange rate. A 10 percent real depreciation will, for given relative price of exports to home goods, substantially increase demand for exports, thus putting upward pressure on the price ratio of goods sold abroad versus goods sold at home. The net effect again depends on demand and supply elasticities. The model run suggests that the real depreciation initially goes for almost 7% out of 10 into higher export prices in terms of home goods, a share that declines gradually to 5% after seven years. In terms of foreign goods the reverse happens;

competitiveness initially increases by no more than 3%, a percentage that gradually increases to reach 5% after a few years.

4.2 The Sources of Turkey's export growth.

Consider next the analysis of the factors contributing to Turkey's export growth. We first ran a benchmark case (BMARK in Figure 3) with the following characteristics:

A   the real exchange rate stays at the value it had in 1979.

B   No export subsidies

C   Import growth in the oil export countries equals 5% in each year of the simulation period (80-87); this makes it equal on average to the import growth in Turkey's OECD trading partners.

We then ran simulations relaxing these assumptions step by step. First the actual real exchange rate is restored (BRER in fig.3). Then actual export subsidies are added (BRERXS in fig.3). Finally, actual import growth in the oil exporting countries is restored; in this run actual exports are reproduced (RXWSU). The figure lisxts what total exports (actual, i.e. based on trading partner data) would have been in each case.

In the benchmark case, exports would have been no less than 74% lower than they actually were by 1987. The initial impact would have b.en lower, but still substantial (36%).[4]/ The figure shows, first of all, that the bulk of this spectacular growth in Turkey's exports can be ascribed to the impact of the real depreciation of the TL. No less than 64 of these 74 percentage points can be ascribed to the impact of the real exchange rate (cf the lines BMARK and BRER in Fig.2). Second, export subsidies had a significant, albeit substantially smaller effect: the third run, BRERXS, adds export subsidies, which adds a further 23 percentage points, bringing the total over the 74% increase between benchmark and actual values, to a total increase of 87% in 1987.

How can this apparent puzzle be explained? How come export subsidies and real exchange rate developments explain more than the actual increase in export volumes? The answer is simple albeit surprizing. Over the period, the Middle East has in fact had a negative (i.e less positive) impact, bringing exports down from an 86 to 74 percent increase between 80-87 (Fig.2). This is, one should note, by comparison to a case where oil importers' import growth grows at the rate observed in Turkey's trading partners in the OECD. Fig. 2 shows what is happening: there we plot both total imports into oil exporting countries and what these imports would have been had they grown at the average growth rate of imports by Turkey's main trading partners in the OECD (5%). The decline after 1985 does not completely offset earlier gains, but certainly makes them a great deal less impressive.

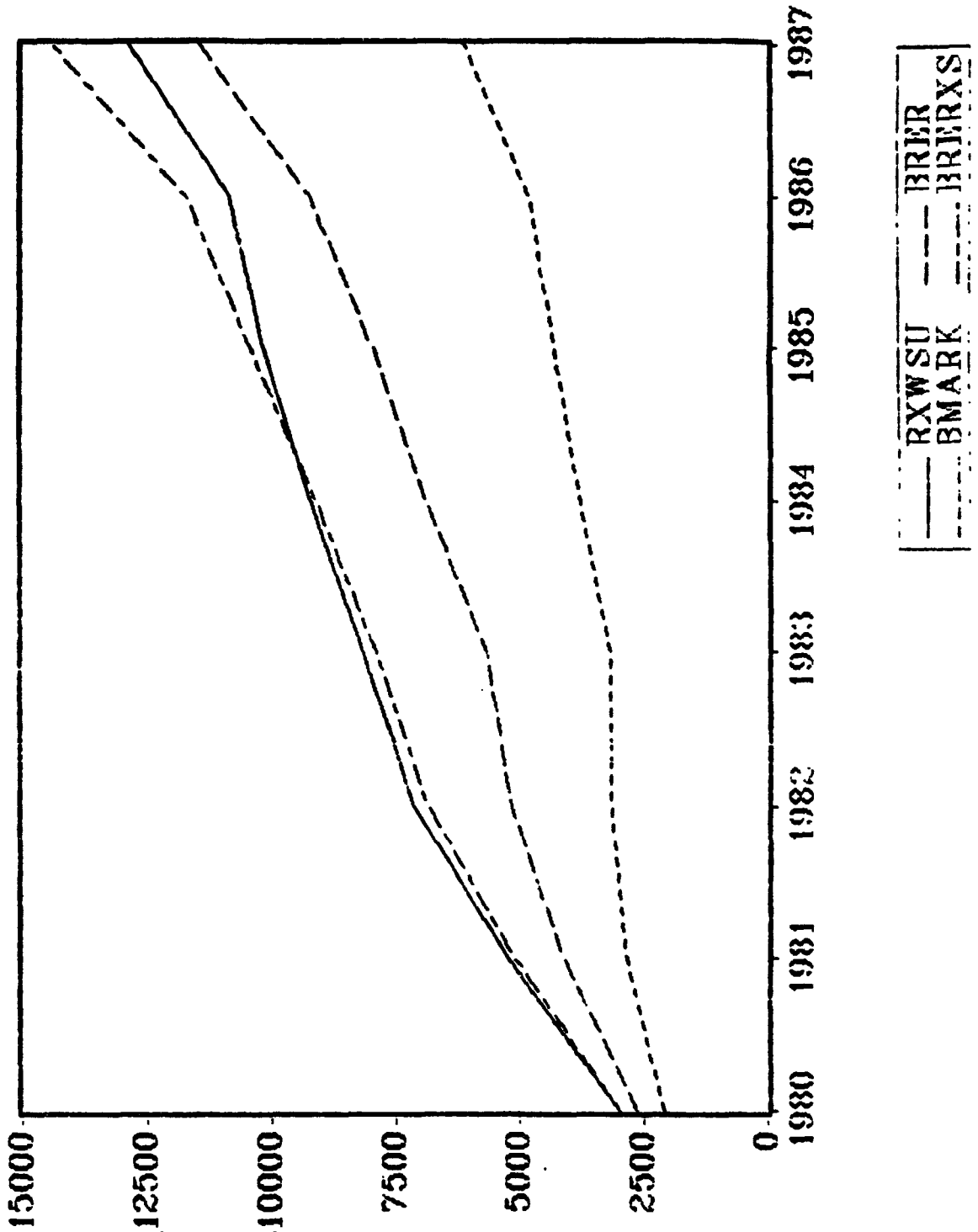[4]   Percentages are calculated as log differences.

Figure 3: Actual and Counterfactual export volumes; BMARK: Benchmark case; BRER: Benchmark case plus actual real exchange rate changes; BRERXS: Benchmark case plus actual real exchange rate changes and actual export subsidies; RXWSU: Benchmark case plus actual real exchange rate changes, actual export subsidies and actual real import growth into oil-exporting countries.

5   Conclusions

The outcome, to summarize our conclusions, must to some extent come as a surprise. Import growth in the Middle East in excess of import growth in the rest of the world has in fact made a negative contribution to Turkey's export boom over the period 1980-1987. Overall imports into oil exporting countries have been in precipitous decline since 1984, in belated recognition of the fall in the price of oil of a few years before. Over the period 80-87 it is thus difficult to explain the surge in Turkish exports from that angle alone, as our model simulations confirm.

As to the exports to non-oil countries, we confirm the pattern of overinvoicing found by earlier researchers: there was indeed a switch from underinvoicing to overinvoicing concurrent with the switch in export incentive regime and exchange rate policy in the early eighties. But this switch was nowhere near enough to explain a significant part of the export "miracle" as a mere accounting trick. Even on corrected data, as reported by trading partners, Turkey sustained a real export growth rate of 20% over the 1980-1987 period, and 17.5% percent to the non-oil countries.

With the oil boom out as an explanation of the export boom, two alternative explanations remain. Of these other two alternatives, export incentives and the set of policies allowing real depreciation of the exchange rate, the latter contributed by far the most, as the econometric analysis makes clear. In fact the simulation analysis suggested that export subsidies were mostly shifted backwards into higher producer profits rather than forward into lower (foreign) consumer prices, thus explaining the moderate contributions of the export subsidies to the export boom.

Thus, to sum up, there was a Turkish export miracle, even after extraneous factors such as an oil boom in the Middle East are accounted for; and it was, much more than a response to explicit export incentives, a result of macroeconomic policies and trade reform that allowed a steady real depreciation of the Turkish Lira.

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