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Chapter Title: External Borrowing, Real Wage Flexibility, and Equilibrium Exchange Rates: A General Equilibrium Analysis

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6 External Borrowing, Real Wage Flexibility, and Equilibrium Exchange Rates: A General Equilibrium Analysis

Unlike the earlier stabilization episodes, the post-1980 adjustment program featured a greater emphasis on export promotion, trade liberalization, and maintenance of realistic exchange rates. As discussed in chapters 4 and 5, policymakers attached a high priority to the attainment of an export-led output recovery in the earlier stages of the program. In this policy setting, a strong preference was also shown for large export subsidies to neutralize the preexisting anti-export bias in the trade regime, rather than for rapid import liberalization to achieve a broad neutrality in the protection and incentive system. Thus, after the removal of quotas in mid-1981, the import regime remained only partly liberalized, with a continued reliance on licensing and prohibited imports as restrictive tools until 1984 and 1985.

Although import restrictions were not fully removed in the early 1980s and export subsidies were quite substantial, the overall adjustment policy displayed a strong commitment to the maintenance of an adequately depreciated real exchange rate in an effort to reduce domestic absorption and stimulate expenditure switching toward exports. In this vein, the authorities adopted a flexible exchange rate policy, which took the form of daily adjustments (from mid-1981 on) against a currency basket. As was shown previously (in tables 4.5 and 5.4) the real exchange rate depreciated considerably after 1979, despite the large differentials observed between domestic and world inflation rates.

The Turkish experience with flexible exchange rates in the early 1980s is of general comparative interest. As reviewed and emphasized by Taylor (1979, 50–55), a devaluation from an initial position of deficit is likely to yield a contractionary effect on output, especially in structurally rigid economies. The Turkish setting of the 1980s featured a rigid economic structure (i.e., low substitution elasticities), but also contained three additional relevant elements, namely (a) sizable capital inflows, (b) downward flexibility in real wages, and (c) export demand shifts connected with the special conditions in the Middle East (as noted in chap. 4). An important question is the extent to which these elements contributed to the output recovery in a context where sharp depreciations of the real exchange rate threatened recessionary consequences. We concentrate in this chapter on the respective contributions of external financing and real wage flexibility, and leave to chapter 7 further discussion of the role of Middle Eastern demand. Our framework also allows us to estimate equilibrium exchange

rates and income levels that would have prevailed under a more rapid process of trade liberalization in the early 1980s.

We present here the principal findings of a numerically based general equilibrium analysis of the Turkish economy in the early 1980s. The analysis summarized in this chapter has been conducted within the framework of a dynamic multisector general equilibrium model calibrated to the data observed from 1978 to 1983.[1] On the basis of a set of counterfactual experiments, we seek to examine what might have happened if Turkey had (a) pursued a more rapid trade liberalization, (b) received less capital inflow, and (c) experienced greater rigidity of real wages in the urban sector. The experiments suggest that a swifter trade liberalization under reduced borrowing would have produced an adverse effect on the level of economic activity, which would have been magnified if urban wages remained rigid in real terms.

In the remainder of this chapter, section 6.1 presents the basic features of the model used. In section 6.2 the counterfactual experiments are defined and their results interpreted. This section also provides a crude estimate for the social productivity of external borrowing in the early and mid-1980s. In section 6.3 we recapitulate the main findings and policy lessons.

6.1 The SIMLOG-1 Model

SIMLOG-1 is a dynamic, multisectoral, and computable general equilibrium (CGE) model of the Turkish economy, which has been calibrated for the 1978–83 period. The model closely reproduces the actual changes in relative prices, major sectoral variables, and macroeconomic balances observed in the 1978–81 and 1981–83 subperiods.

The present model differs in two major ways from the earlier multiperiod CGE models built by Derviş and Robinson (1978) and Lewis and Urata (1983) in the context of the World Bank evaluations of the Turkish economy. First, the national accounts and public finances in the present model are structured around the system of accounts actually used by the SPO, which explicitly identifies private-public disposable incomes and savings as analyzed in chapters 5 and 8. Second, the nonlinear equation system of the new model is solved by the computational procedure designed by Yaprak (1982), which solves, in the Johansen (1960) tradition, for the log changes (or growth rates) of endogenous variables in a given time period, and updates their level values sequentially for new solutions in the subsequent periods of the simulation horizon. Hence the name SIMLOG: Simulation with an Interindustry Model based on Log-change variables.

The full data base, functional forms, variables listings, and detailed Base Run results of SIMLOG-1 are presented in Celâsun (1986a), which also provides a discussion of its historical antecedents and relation to other applied general equilibrium models. Referring the reader to that study for

technical details (and further sources and references), the distinguishing features of the model are briefly noted in the remainder of this section.

6.1.1 Input-Output Core, Trade Flows, and Primary Factor Supplies

SIMLOG-1 is built around a four-sector (agriculture, energy, manufacturing, and services) input-output (I-O) core based on an estimated I-O table for the year 1978. The energy sector includes all commercial primary and secondary energy production, including coal, crude oil, petroleum refining, and electricity and gas production. The manufacturing sector excludes oil refining, but includes the relatively minor subsector of nonenergy mining. The combined employment and value-added figures for energy and mining correspond, therefore, to those of the industry sector defined in the national accounts. The model is designed in such a way as to analyze the import demands of the energy sector quite explicitly in the wake of the second oil price shock of 1979–80. It may be recalled that the ratio of oil imports to merchandise exports, in value terms, was 61, 82, and 64 percent in the benchmark years 1978, 1981, and 1983, respectively.

In SIMLOG-1, imports are first grouped into oil imports and nonoil imports. The imported oil (the bulk of which is crude oil) is treated as a complementary input in aggregate energy production. In turn, nonoil imports are classified by sector of origin in their respective product categories as (in the conventional terminology of I-O literature) competitive imports. Merchandise exports are also classified by sector of origin in producers' prices, with an explicit treatment of trade margins, which rose substantially after 1980. In the absence of precisely classified data on services trade, exports of (nonfactor) services are estimated net of imports in the services sector.

The model distinguishes four types of labor: (1) agricultural, (2) nonagricultural wage, (3) nonagricultural nonwage, and (4) government employees with civil service status (appearing only in services). The nonagricultural (N-A) wage labor includes all workers in formal employee status (excluding government employees). N-A nonwage labor represents all informal workers, covering self-employed, small-enterprise, and family workers.

In presenting the employment details of SIMLOG-1, the rural and urban categories loosely correspond to agriculture and nonagriculture respectively, at the cost of ignoring the seasonally shifting status of marginal workers. The total labor supply is exogenously fixed, but its rural-urban composition is endogenously adjusted over time as a function of changing income differentials. For purposes of employment analysis, N-A nonwage laborers are treated as having imputed factor prices (wages) in the labor market, roughly reflecting minimum wage scales in the economy. The model defines a wage index (1978 = 1.0) for each N-A labor type, but allows variations in the movements of these wage indices over time for the analysis of

substitution between labor types. In the historical simulation, sectoral wage differentials for N-A labor types 2 and 3 are maintained at their base-year proportions.

Besides labor, capital is also treated as a primary factor. Sectoral capital stocks are updated over time by taking into account the depreciation factor and the new capacity creation effects of fixed investments featuring one-year gestation lags. The capital composition matrix remains constant over time.

6.1.2 Production and Factor Demand

In SIMLOG-1, producers are assumed to be price-takers in factor and products markets, and aim to equate factor prices with their marginal value products. In the model formulation, the treatment of production functions varies by sector, depending on the scope for input substitution.

In agriculture, a constant elasticity of substitution (CES) aggregation of labor and capital is allowed for value-added formation, while fixed I-O coefficients are used to derive demands for intermediate inputs. The subsidies on manufacturing inputs into agriculture are explicitly incorporated. The (imputed) wage rate of agricultural labor adjusts to balance labor demand with endogenously determined rural labor supply.

In the energy sector, which has only one type of labor, input substitution is treated through a three-level CES aggregation. First, capital and labor are aggregated to form a composite primary input. Second, the imported oil and intrasectoral energy use are combined to form a composite intermediate energy input. Third, a limited degree of substitution is allowed between these composite forms of intermediate energy and primary inputs to capture the workings of the policy emphasis on hydroelectricity investments, which aim to reduce the share of fuels in Turkey's energy balances. The nonenergy intermediate inputs in this sector have fixed coefficients.

The manufacturing and services sectors also feature a three-level CES analysis of input substitution in a slightly altered manner. In these two sectors, N-A labor types have a CES aggregation. At the remaining two levels, capital and labor are combined to form a composite primary input, which is then aggregated with intermediate inputs, all in a price-responsive fashion.

For the analysis of urban employment conditions, the model can be operated under two variant modes, either with fixed or flexible real wages for N-A laborers (excluding government employees, who are always treated exogenously). The real (gross) wages are translated into nominal (gross) wages through an endogenously computed consumer price index. As regards technical progress in production, the model adopts the Hicks-neutral form of total factor productivity growth (TFPG) in the CES aggregation of capital and labor. The TFPG in manufacturing is partly related to changes in quantity rationing of nonoil imports. The observed changes in rates of capacity utilization are also captured by movements in TFPG.

6.1.3 Product Markets and Final Demand

The model treats the world prices of imported goods as exogenous data. On the export side, export volumes are sensitive to differences between Turkey's own export prices and the world prices of other country's exports, measured in dollars. The dollar prices of Turkey's exports are endogenously determined on the basis of domestic production costs, trade margins, the exchange rate, and export subsidies which have fiscal and nonfiscal components. The export demand functions shift over time, reflecting real growth of world (or regional) trade in the relevant product categories.

Nonoil imports (classified by sector of origin) and domestically produced goods are considered to be imperfect substitutes. For the base year (1978), the model specifies the levels of desired (nonoil) imports for each sector on the basis of the import restrictions observed in that period. From the base year onward, the ratio of desired imports to domestic output available for the home market is allowed to change in response to relative price movements within the framework of CES-type trade aggregation functions. The domestic demand flows are therefore valued in terms of composite good (or, simply, sectoral) prices.

Under a restrictive trade regime, the total dollar value of desired imports may exceed foreign exchange supply available for their finance. As extensively discussed in Derviş, de Melo, and Robinson (1982, 288–316), quantity and/or premium rationing schemes may be specified to allocate available foreign exchange among competing sectors. Considering the heavy use of prohibited imports (mainly consumer goods) and user-specific licensing procedures in the simulation period, SIMLOG-1 adopts the quantity rationing scheme and determines the quantity rationing factor, RIMP, as the ratio of available foreign exchange to total desired (nonoil) imports.

For domestic final demand, the model identifies private consumption, public consumption, fixed investment, and inventory changes. The behavior of the average consumer is based on the linear expenditure system. The sectoral proportions of other final demand items are in the main exogenously determined.

6.1.4 Distribution and Disposition of Income

The model identifies five groups of income: (1) agricultural, (2) N-A wage and salary, (3) N-A nonwage labor, (4) N-A profit, and (5) workers' remittances from abroad. The gross incomes of the first four groups add to the GDP, and thus constitute the elements of the functional distribution of income.

In turn, the model defines public and private sectors as two distinct institutional entities. In line with the official planning practice, public and private disposable incomes (in nominal prices) are determined after

distributing the tax burden and transfer payments over the relevant activities and income groups. The accounting system also tracks factor income flows from (and to) the rest of the world. For purposes of income flow analysis, Celâsun (1986a) provides a social accounting matrix for the base year 1978.

For the public sector, public consumption is exogenous and public savings is determined residually. For the savings-generation process, the model introduces a forced-savings item corresponding to new money creation, the burden of which is distributed over the income groups proportionally. Forced savings is used to finance the public deficit and the increases in foreign exchange reserves, with the remaining part channeled to the private sector for investment financing. The voluntary savings of income groups are determined as functions of their disposable incomes and an (exogenous) real interest rate defined in the form suggested by Taylor (1979, 223–27). The direct taxes paid by various groups are also determined as functions of disposable incomes.

6.1.5 Price Normalization and Exchange Rate

In the model, prices are normalized around an aggregate price index (GDP deflator). In multiperiod simulations, this index is exogenously fixed in two variant forms. In one variant, it is updated over time to reflect domestic inflation rates, taking also into account the absolute changes in all other exogenous prices. In the other variant, which is computationally more efficient, the aggregate price index is maintained constant from a particular benchmark year onward. In this second variant, all nominal variables and exogenous prices are measured in their price-level-deflated (PLD) forms. In this context, the dollar-valued balance-of-payments data (and world prices) also need to be deflated by a suitably chosen world price deflator (e.g., the world price of manufactured imports).

In the applications, the nominal, real, and equilibrium concepts of the exchange rate need to be distinguished. The nominal exchange rate is the parity that converts U.S. dollars into domestic currency (TL). The real exchange rate refers to the purchasing-power-parity, price-level-deflated (PPP-PLD) version of the exchange rate, which is obtained by adjusting the nominal exchange rate for the differential between the domestic and world inflation rates. In turn, the equilibrium (or flexible) exchange rate is the endogenously determined parity given a set of policy instruments and (exogenous) balance-of-payments data.

6.1.6 Closure Rules for the External and Internal Balance

To obtain solutions for the model, macrolevel closure rules need to be specified for the external and internal balance. The external balance corresponds to the current deficit, which is determined by adjusting the merchandise trade deficit for invisible flows in the current account of the balance of

payments. The current deficit is financed by external capital inflow and changes in reserves.

In the simulations presented below, external capital inflows, reserve changes, and thus the current deficit are exogenously specified. Under a given system of import tariffs and export subsidies, the external balance is then achieved by determining one of the following two variables endogenously: the exchange rate or the RIMP for nonoil imports.

For the savings-investment balance, we adopt the closure rule which treats private fixed investment as the main adjusting variable. In this particular version of the model, public fixed investment and foreign savings (current deficit) are exogenously specified. Inventory changes are determined on the basis of stock/output ratios. Private fixed investment therefore adjusts to the available savings in the economy.

6.1.7 Model Calibration and Validation, 1978–83

To establish a reliable numerical basis for its functional use, a model of the type outlined above should be simulated and tested over a given historical period in order to "validate" its capability to track the interdependent movements actually observed in the economy. As described in Celâsun (1986a), the historical calibration and testing of the model over the turbulent period of 1978–83 was a cumbersome research effort, especially in view of the frequently revised ex post official data for key macro economic and public finance variables.

Table 6.1 presents actual data and model estimates for selected macroeconomic variables for the benchmark years 1978, 1981, and 1983 in the Historical Base Run.[2] The actual and model-estimated labor market data are shown in table 6.2.[3] The external closure rule for the Historical Base Run treats the RIMP for nonoil imports as the adjustment mechanism, while fixing the nominal exchange rate at its observed (official) annual average values over the 1978–83 period.

A comparative review of the data shown in tables 6.1 and 6.2 indicates that the model closely replicates the actual observed values in this period. As shown in table 6.1, the model's estimate for the RIMP is less than 100 percent in 1983, which implies that a portion (about 19.3 percent) of desired nonoil imports was repressed by quantitative restrictions (QRs). The Turkish economy witnessed a substantial but not complete import liberalization during 1980–83. After the elimination of quotas in 1981, the import regime continued to rely on QRs in the form of prohibited imports, licensing, and various approval mechanisms to limit actual imports to foreign exchange availability. The more comprehensive import liberalization measures taken in 1984 and 1985 also indicate that desired demand for nonoil imports was not fully (100 percent) met in 1983. The order of magnitude of the 1983 RIMP value appears therefore reasonable for purposes of model experiments, although it cannot be checked against a precisely observed figure.

Table 6.1 **Actual and Model Estimates for Value Added and Disposition of Income, 1978–83 (Historical Base Run)**

	1978	1981		1983	
	Model	Model	Actual	Model	Actual
A. Index of real value added (1978 = 100)					
1. Agriculture (f.c.)	100.0	103.0	104.6	108.7	111.0
2. Nonagriculture (f.c.)	100.0	103.1	102.5	112.5	111.6
3. (1) + (2) = GDP (f.c.)	100.0	103.1	103.0	111.6	111.5
B. Nominal value added (billion TL in current prices)					
1. Agriculture (f.c.)	301	1,348	1,325	2,071	2,058
2. Nonagriculture (f.c.)	778	4,655	4,735	8,458	8,727
3. (1) + (2) = GDP (f.c.)	1,188	6,033	6,060	10,529	10,785
4. GNP (market prices)	1,285	6,483	6,553	11,181	11,485
C. Disposable incomes (as % of nominal GNP)					
1. Public	18.9	19.3	19.3	18.6	17.4
2. Private	81.1	80.7	80.7	81.4	82.6
D. Savings-investment balance (as % of nominal GNP)					
1. Public savings	6.3	8.5	8.6	7.6	7.3
2. Private savings	12.7	11.9	9.4	10.3	9.2
3. Current deficit[a]	2.8	3.4	3.5	4.3	4.1
4. (1) + (2) + (3)	21.8	23.8	21.5	22.2	20.6
5. Public fixed investment[a]	10.5	11.7	11.7	11.3	11.4
6. Private fixed investment	9.8	7.4	7.4	8.2	7.5
7. Public stock changes	1.0	2.8	1.5	1.3	0.1
8. Private stock changes	0.5	1.8	1.1	1.3	1.6
9. (5) + (6) + (7) + (8)	21.8	23.7	21.5	22.1	20.6
E. Current account[b] (million $ in current prices)					
1. Merchandise exports	2,288	4,709	4,703	5,732	5,728
2. Merchandise imports					
a. Oil	−1,396	−3,724	−3,878	−3,525	−3,661
b. Nonoil	−3,203	−5,214	−5,055	−5,705	−5,574
c. (a) + (b)	−4,599	−8,938	−8,933	−9,230	−9,235
3. Exports of the service sector, net	402	1,066	n.a.	1,274	n.a.
4. Factor income from abroad, net[a]	491	1,195	n.a.	101	n.a.
5. Current deficit[a]	−1,418	−1,968	−1,968	−2,123	−2,123
F. Quantity rationing factor (RIMP) for nonoil imports	0.603	0.697	n.a.	0.807	n.a.
G. Foreign terms of trade (1978 = 100)	100.0	68.4	70.6	64.4	66.4

Source: Celâsun (1986a).

Note: f.c.: factor cost. n.a.: precisely classified actual data not available.

[a]Exogenously specified magnitudes in the Historical Base Run.

[b]Presentation follows the old format of balance of payments.

Table 6.2 **Actual and Model Estimates for Labor Market and Real Wages, 1978–83 (Historical Base Run)**

	1978	1981		1983	
	Model	Model	Actual	Model	Actual
A. Labor market (thousand workers)					
1. Labor demand					
a. Agriculture	9,537	9,501	9,512	9,475	9,451
b. Industry (energy + manufacturing)	1,897	1,897	1,822	1,943	1,911
c. Services	3,886	3,990	4,034	4,198	4,215
d. (b + c) Nonagriculture (N-A)	5,713	5,887	5,856	6,141	6,126
e. (a + d) Total	15,250	15,388	15,368	15,616	15,577
2. Total labor supply	16,640	17,607	17,621	18,282	17,773
3. Surplus labor (N-A)	1,390	2,219	2,253	2,666	2,196
B. N-A real wage indices (1978 = 100)[a]					
1. N-A labor 1	100.0	65.0	66.4	63.4	65.0
2. N-A labor 2	100.0	67.5	n.a.	65.9	n.a.
3. N-A labor 3	100.0	51.7	50.9	51.7	52.1

Source: Celâsun (1986a).

Note: n.a.: precisely classified actual data not available. N-A labor: 1 = wage labor; 2 = nonwage labor; 3 = government employees.

[a]The actual real wages for N-A labor 1 and 3 are obtained by deflating the Employers Federation nominal wages and net nominal salaries of civil servants (in 7th salary grade) by the Aggregate Price Index of the Historical Run. See sources cited in Celâsun (1986a).

6.2 Counterfactual Experiments

6.2.1 Preliminaries

The counterfactual experiments are structured in such a way as to bring out the major lessons from the Turkish experience with wage, trade, exchange rate, and borrowing policies in the early 1980s. We distinguish between trade-liberalizing and deficit-reducing devaluations (following Krueger 1981), and carry out a number of counterfactual experiments designed to explore the general equilibrium effects of trade liberalization under varying targets for the payments deficit.[4]

For purposes of counterfactual analysis, the Historical Base Run is resimulated in an altered form, which endogenously determines the exchange rate under exogenously fixed RIMP values. This restructured solution is simply referred to as the Base Run, which also treats real wage indices exogenously. With such adjustments in the model structure, the Base Run serves as a benchmark for all counterfactual experiments.

For analytical convenience, the Base Run and counterfactual experiments are simulated from 1981 on under the constant 1981 level of the aggregate price index. As noted in section 6.1, this particular mode of price normalization requires the use of PLD domestic and external data. This

approach provides a basis on which to determine and compare equilibrium exchange rates in real (PPP-PLD) terms, excluding the effects of domestic-world inflation differentials. All counterfactuals are thus solved for the 1981–83 period, proceeding from the same 1981 solution obtained in the Base Run.

6.2.2 Description of Experiments

To isolate and examine the effects of wage policy on equilibrium exchange rates, the counterfactual experiments are designed in two groups, A and B. In group A experiments, N-A real wages are exogenously specified, as in the Base Run, and N-A employment is endogenously determined. In group B, the model exogenously fixes the 1983 actual figure for total N-A employment as a target and flexibly determines the real N-A wages (for labor types 1 and 2, as described in sec. 6.1.1).[5] To avoid further complications, the ratio of real wage indices for N-A laborers 1 and 2 is maintained constant. All experiments in groups A and B are simulated with equilibrium (or flexible) exchange rate specification. Group A includes the following experiments:

E-1A: Base Run + fixed N-A wages + additional trade liberalization involving a 10 percent increase in RIMP and 50 percent decrease in fiscal subsidy on manufactured exports.

E-2A: Base Run + fixed N-A wages + 50 percent reduction in the 1983 value of the current deficit (which was about $2.1 billion in current prices) + 10 percent fall in foreign interest payments in 1983.

E-3A: E-1A + E-2A

In group B, experiments E-1B, E-2B, and E-3B are the same as experiments E-1A, E-2A, and E-3A, respectively, except that they feature flexible N-A real wages as noted above.

In each group, then, the first experiment investigates the consequences of enhanced trade liberalization, the second of reduced external borrowing, and the third of the two combined. Group A assumes fixed urban real wages, while B allows them to vary. The exchange rate equilibrates external accounts in all cases.

6.2.3 Economywide Results

Table 6.3 presents a summary of the economywide results of the counterfactual experiments for the year 1983 in terms of ratios to the Base Run estimates, which closely replicate the actual 1983 data as shown previously in tables 6.1 and 6.2. Part A in table 6.3 lists the distinguishing characteristics of the experiments systematically.

Under the fixed real wage regime, a trade-liberalizing devaluation (E-1A) has a mild contractionary effect on N-A employment, with practically no

Table 6.3 **Counterfactual Experiments: Basic Features and Some Economywide Estimates, 1983 (ratios to Base Run values for 1983)[a]**

	Fixed N-A Real Wages			Fixed N-A Employment		
	E-1A	E-2A	E-3A	E-1B	E-2B	E-3B
A. Counterfactual policy restrictions						
1. Current deficit (nominal $)	1.0	0.5	0.5	1.0	0.5	0.5
2. RIMP for nonoil imports	1.1	1.0	1.1	1.1	1.0	1.1
3. Subsidies on manufactured exports	0.5	1.0	0.5	0.5	1.0	0.5
4. N-A employment	-----Endogenous-----			1.0	1.0	1.0
5. Real wage index (N-A labor 1)	1.0	1.0	1.0	-----Endogenous-----		
6. Ratio of real wage indices for N-A labor 1 and 2	1.0	1.0	1.0	1.0	1.0	1.0
B. Counterfactual model estimates						
1. Major prices						
a. Equilibrium exchange rate (real, 1981 prices, TL/$)	1.165	1.252	1.417	1.172	1.275	1.447
b. Real wage index (N-A labor 1)	1.000	1.000	1.000	0.979	0.934	0.913
c. Foreign terms of trade	0.843	0.723	0.567	0.835	0.699	0.536
2. Real GDP (f.c.)	1.000	0.989	0.989	1.002	0.995	0.997
3. Real fixed investment	1.026	0.914	0.939	1.023	0.905	0.929
4. Real private consumption	0.984	0.962	0.947	0.988	0.971	0.958
5. N-A employment	0.994	0.979	0.973	1.000	1.000	1.000
6. Foreign trade (nominal $)						
a. Merchandise exports	1.034	1.063	1.097	1.035	1.069	1.104
b. Exports of the service sector, net	1.036	1.064	1.100	1.038	1.071	1.108
c. Oil imports	0.972	0.944	0.916	0.973	0.949	0.923
d. Nonoil imports	1.059	0.951	1.010	1.060	0.955	1.015

Source: Celâsun (1986a).

[a]All counterfactual experiments take 1981 model solution as a point of departure and adopt the exogenous estimates of the Historical Base Run for 1981–83, with the exception of policy restrictions indicated in part A of the table.

impact on the GDP level. The implication is that the contractionary impact of devaluation (in conjunction with reduced QRs) on import-competing sectors is offset by export-led output increases in the economy. In this experiment, the increase in the nonoil import bill (due to lowered QRs) is balanced by devaluation-induced reduction in oil imports and expansion in exports. Under flexible real wages in experiment E-1B, trade-liberalizing devaluation (at the same current deficit) is neutral in its effects on aggregate income and N-A employment, but requires a cut in real wages.

A deficit-reducing devaluation in the context of an unchanged trade policy (E-2A) has a notable contractionary effect on GDP and N-A employment. To accommodate the reduced capital inflow, the devaluation requirement (in E-2A) becomes quite large, leading to import contraction and export expansion, with particularly adverse consequences for real fixed investment and the foreign terms of trade. The flexibility of real wages in experiment E-2B reduces GDP losses, but results in lower real wages.

If, as in experiment E-3A, Turkey had pursued simultaneously a more rapid trade liberalization and a 50 percent smaller current deficit in 1983 (starting from the actual initial conditions in 1981 and other government policies remaining the same), this would have required a sharper real depreciation and depressed levels of private consumption and N-A employment. Again, downward flexibility in real wages (experiment E-3B) would have contributed to the maintenance of employment levels, but the required cuts in real wages would have been considerable (nearly 9 percent), especially in the aftermath of the 1979–80 erosion in wage earnings.

6.2.4 Social Marginal Productivity of External Borrowing

In the medium term, trade liberalization aims at a neutral system of incentives for exports and import-substitutes, and to enhance efficiency in resource allocation. In the short run, however, a trade-liberalizing move (involving removal of nontariff barriers) in combination with a flexible exchange rate policy tends to entail some social costs in the form of reduced N-A employment or real wages, depending upon the wage policy adopted. In this context, the size of the capital inflow becomes a crucial variable affecting macroeconomic performance. It is often suggested that the social marginal productivity of external borrowing in the earlier stages of trade liberalization might be quite high "as long as the stabilization program appears to have a good chance of success," as emphasized by Krueger (1981, 113).

The counterfactual experiments reported in table 6.3 provide a quantitative basis to derive rough estimates for the social productivity of external borrowing under the observed conditions of the Turkish economy in the early and mid-1980s. It may be noted that a 50 percent reduction in the current deficit corresponds to about 2 percent of nominal GDP in 1983, which is approximately equivalent to 1.5 percent of real GDP measured in constant 1987 prices. A comparison of experiments E-1B and E-3B shows that the real GDP loss would have been about 0.5 percent if the additional trade liberalization were to be carried out in conjunction with a 50 percent lower deficit (net borrowing) target. These indicators broadly suggest that the social marginal productivity of external capital, in GDP terms, was about 33 percent (0.5/1.5). A comparison of the results of experiment E-2B with the Base Run data also reveals a similar order of magnitude.

The welfare implications of external borrowing are much more complex and require a longer term horizon for an appropriate assessment. Nonetheless, the Turkish experience suggests that in the context of an adjustment program, external finance can be highly productive at the aggregate level. With real wages maintained constant, a $1.0 billion fall in external borrowing would have reduced N-A employment by 2 percent, implying a loss of the equivalent of 120,000 full-time jobs in the Turkish economy.

6.2.5 Sectoral Responses to Exchange Rate Adjustments

In table 6.4 we summarize data on the sector-level responses of the Turkish economy under experiments E-2A, E-3A, and E-3B, which all involve deficit reduction under a flexible exchange rate policy. As revealed by the macroeconomic indicators of these experiments, deficit-reducing devaluations generate a deflationary impact on real GDP, which implies that depressed domestic expenditures are not fully offset by export expansion in real terms.

A comparison of sectoral employment and output indicators for experiments E-2A and E-3A shows the resource-pulls originating from a

Table 6.4 **Counterfactual Experiments: Sector-level Adjustments to Reduced External Borrowing (ratios to Base Run values for 1983)[a]**

	Experiments[b]		
	E-2A	E-3A	E-3B
A. Employment			
Agriculture	1.000	1.001	1.010
Energy	0.972	0.963	0.991
Manufacturing	0.992	0.953	0.990
Services[c]	0.963	0.964	1.007
B. Gross output			
Agriculture	0.999	1.000	1.006
Energy	0.958	0.937	0.944
Manufacturing	0.995	0.991	1.002
Services	0.985	0.987	0.995
C. Desired competitive imports			
Agriculture	0.879	0.798	0.795
Energy (nonoil)	0.927	0.888	0.893
Manufacturing	0.946	0.906	0.911
D. Competitive imports (balanced)			
Agriculture	0.884	0.923	0.921
Energy (nonoil)	0.907	0.993	0.997
Manufacturing	0.953	1.014	1.019
E. Complementary (oil) imports	0.945	0.918	0.924
F. Exports			
Agriculture	1.190	1.313	1.332
Energy (exogenous)	1.000	1.000	1.000
Manufacturing	1.263	1.402	1.432
Services (net of imports)	1.257	1.401	1.435
G. Consumer demand			
Agriculture	0.983	0.976	0.979
Energy	0.894	0.842	0.858
Manufacturing	0.942	0.931	0.944
Services	0.970	0.948	0.963

Source: Celâsun (1986a).

[a]See footnote a in table 6.3. All the variables indicated in this table are measured in real terms.

[b]These particular experiments feature 50 percent reduction in the current deficit (of $2,123 million) for the year 1983, which was about 4 percent of GNP in current prices.

[c]Excluding government employees.

trade-liberalizing adjustment in the exchange rate at the reduced level of current deficit. Under fixed urban real wages, agriculture and services tend to respond favorably in output and employment spheres to reduced QRs in the imports regime, while energy and manufacturing display downward trends. With flexible urban real wages, trade-liberalizing devaluation (E-3B) stimulates agriculture and services more vigorously, while also providing a mild output expansion in manufacturing (as contrasted with the results of E-3A).

Consumer demand shifts in experiments E-2A and E-3A (both under fixed urban real wages) strongly underline the workings of relative price effects on the level and composition of real private consumption expenditure, which adjusts sharply to allow expenditure switching in favor of exports. It is evident that large depreciations concurrently serving deficit-reduction and trade-liberalization objectives have substantial short-term social costs in terms of reduced real consumption levels.

6.3 What Have We Learned?

In the present chapter we have summarized the results of a general equilibrium analysis of the Turkish economy in the early 1980s. The study eschewed a formal consideration of money and inflationary dynamics. The focus of the analysis has been on the implications of alternative policies for trade liberalization, external borrowing, and urban wage settlement under a flexible exchange rate regime.

Although the time frame of our counterfactual experiments extended over the relatively short period of 1981–83, the results nonetheless provide clues to the short- and medium-term impact of policy initiatives which were intensely debated in the wake of the 1980 adjustment program. The counterfactual analysis has shown that the Turkish recovery effort strongly benefited from external financial assistance extended in the post-1980 period. In GDP terms, the social marginal productivity of external borrowing was around 33 percent in the early and mid-1980s.

The counterfactual experiments have also revealed that a more rapid trade liberalization, under the actual levels of net foreign borrowing, would have generated a moderate fall either in the level of nonagricultural employment or in real wages, depending upon the wage policy adopted for the urban sector. Thus, a more speedy transition to an open trade regime would have entailed additional social costs in the early 1980s. The Turkish policymakers showed prudence in choosing a more gradualist approach in import liberalization and relying on export subsidies to neutralize the anti-export bias in the trade regime.