

## APPENDIX TO PART II

THE NIS–FOREX MARKET: CONCEPTUAL FRAMEWORK<sup>1</sup>

To measure the net quantities of forex sold/acquired in the NIS–forex market on the basis of the sectors that are active in the market, we started with the national balance of payments and manipulated its components in order to develop a closed dataset that reflects only activities of the sectors that affect and are affected by the exchange rate. It is especially important to adjust the balance-of-payments component because the current-account deficit and movements in the financial account (“capital movements”) of the balance of payments are not the only factors that affect, and are affected by, the NIS exchange rate. Domestic forex activity among economic sectors, such as forex borrowing and depositing by the public with banks in Israel, and NIS–forex forward activity also affect and are affected by the exchange rate. Furthermore, some components of the balance of payments are irrelevant to the NIS–forex market because activity in them does not take place via the market and has no direct relationship to the NIS exchange rate. Moreover, the conventional classification of the balance of payments disregards a matter of vast importance for analysis of the NIS–forex market: the currency in which the activity takes place (NIS or forex). Below are the main differences between the two sets of reports:

*Activity included in the balance of payments but not in the NIS–forex market*—domestic transactions between the government and nonresidents, since the government neither acquires or converts forex in the domestic market. For the same reason, transactions related to the foreign reserves are not included in the NIS–forex market.

*Activity included in the NIS–forex market but not in the balance of payments*—domestic forex transactions among residents, such as forex-denominated and -indexed credit and deposits and forex–NIS forward transactions and put and call options. Forex-indexed bonds, issued by the government and acquired by residents, and forward contracts between residents and banks are not included in the balance of payments.

*Activity included in both sets of reports but classified differently*—In the balance of payments, classification is based on the assets side (of residents and nonresidents) irrespective of the currency of activity. Classification in the NIS–forex market, in contrast, is based on currency. Thus, activity in domestic assets (NIS and forex) is attributed to nonresidents whereas activity in external assets (NIS and forex) is attributed to residents. The items classified differently under this principle include credit from nonresidents (including bond issues), nonresident forex deposits, and NIS credit from banks to nonresidents.

*Activity included in both sets of reports but measured differently*—In the NIS–forex market, activity in options is measured by calculating the change in exposure (change

<sup>1</sup> For further details, see the Bank of Israel Web site: [http://www.bankisrael.gov.il/deptdata/pik\\_mth/expa\\_h.htm](http://www.bankisrael.gov.il/deptdata/pik_mth/expa_h.htm)

in equivalent value). In the balance of payments, in contrast, activity is measured by calculating the value of the transaction, concluded or expired, on the basis of the Black and Scholes formula.<sup>2</sup>

Importantly, activity in the market is measured not from the technical point of view of cash conversion of NIS into forex and vice versa but rather in view of the exposure of the asset acquired/sold to exchange-rate changes. This method of measurement establishes a relationship between the sums of forex that each sector has sold or acquired, in net terms, and the change in its exposure to the NIS exchange rate. This change affects the exchange rate and is affected by it. When a nonresident buys an NIS bond, for example, a record is entered in the balance sheet of the NIS–forex market that he/she has acquired an NIS asset and, accordingly, has sold forex for NIS—whether he/she paid in NIS, after having converted the forex into NIS or borrowed NIS from the Bank of Israel, or whether he/she paid in forex (even if the seller of the bond did not convert the forex received into NIS). This is because the acquisition of the NIS bond in such a case has changed the purchaser’s NIS exchange-rate exposure. Concurrently, the acquisition of forex by residents—the nonbanking private sector or the banks—is recorded in accordance with the manner of payment.

Net sales of forex by the *nonresident sector*, in which the underlying currency is forex, are measured by means of nonresidents’ net activity in NIS assets and liabilities. Within this construct, shares of Israeli companies, including those traded abroad, are considered NIS assets for the purpose of the NIS–forex market, just as foreign shares are considered forex-denominated assets. The practical method of classifying shares as NIS or forex assets—a necessary classification in view of the measuring method explained above—is based on the identity of the issuing company. Thus, shares are classified as NIS assets if issued by an Israeli firm and as forex assets if issued by a foreign firm. It would be more correct to classify shares on the basis of the currency composition of the issuing company’s financial flows, but this is impractical. Be this as it may, the currency and location of trading are not appropriate criteria for the requisite classification of shares.

Net forex sales by the *nonbanking private sector*, in which the underlying currency is the NIS, are measured by means of the net activity of individuals, financial institutions, and firms in forex-denominated and -indexed assets and liabilities, in Israel and abroad.

Net forex sales by the *banking sector*, in which the underlying currency is the NIS, are measured by means of the net activity of banks in Israel in forex-denominated and -indexed assets and liabilities in Israel and abroad—balance-sheet and forward.

Additional elements included in the NIS–forex market are the current-account surplus of the private sector only, capital transfers from abroad to the private sector (mainly by immigrants), open-market sales of forex for NIS by the Bank of Israel, and issues of Gilboa bonds by the government (net of the portion acquired by nonresidents).

<sup>2</sup> This method of measurement, set forth in international definitions (IMF, OECD), measures not the “pressure” on the market but the value of the option.

**Part II Appendix Table 1**  
**Activity in the NIS/Forex Market,<sup>a</sup> 2000–2004**

	2004				(\$ million)
	2001	2002	2003	2004	
1. Nonresident acquisition of NIS assets (sale of forex assets)					
<i>Thereof:</i> in basic account					
1.1 Investment in Israeli shares (in Israel and abroad)	3,105	2,685	5,991	5,665	668
1.2 NIS deposits less NIS credit	4,094	2,198	4,183	4,986	853
1.3 Net purchases of NIS bonds	4,094	2,198	4,183	4,986	853
1.4 Net purchases of NIS/forex forwards	103	-65	122	123	27
2. Sale of forex assets by nonbanking private sector	-32	234	107	41	149
<i>Thereof:</i> in basic account	-1,060	319	1,579	514	-730
2.1 Vis-a-vis nonresidents	-575	-1,358	-4,864	-6,914	-3,177
2.2 In Israel, vis-a-vis banks and government	-1,134	-1,320	-3,384	-2,221	-2,164
<i>Thereof:</i> purchase of NIS/forex futures (-)	-3,407	-4,267	-3,668	-4,383	-4,086
3. Banks	2,831	2,908	-1,196	-2,532	909
3.1 Forex-denominated (working capital)	-16	1,155	-963	-931	943
3.2 Forex-indexed (vis-a-vis residents)	514	562	347	1,484	532
3.3 Forex-indexed government bonds (-)	-1,221	2,638	630	1,623	638
3.4 Purchase of NIS/forex forwards (-)	60	-514	-623	-714	-44
4. Government	598	-88	956	157	151
4.1 Change in balance of forex-indexed bonds held by banks and residents	1,076	-1,474	-616	417	-213
4.2 Private-sector transfers to government in forex	-1,093	-37	-1,927	-1,223	-879
5. Current account of the private sector	-985	-116	-1,974	-1,368	-903
6. Capital transfers (mainly by immigrants)	-108	79	47	146	23
7. Statistical differentials	-2,978	-2,271	-574	637	712
8. Bank of Israel—purchases of forex for NIS	464	254	608	358	85
Surplus on basic account (residents, nonresidents, current and capital account)	565	165	419	-6	900
Purchases of forex (-) and sales of forex (+) include transactions denominated in and indexed to forex, NIS/forex forwards, and NIS/forex-currency options.	0	0	0	0	0
	445	-1,139	832	3,760	1,056
					1,811
					-1,000
					1,893

<sup>a</sup> Purchases of forex (-) and sales of forex (+) include transactions denominated in and indexed to forex, NIS/forex forwards, and NIS/forex-currency options.  
SOURCE: Based on reports by banks to the Bank of Israel.

**Part II Appendix Table 2**  
**Nonresident Purchases of NIS Assets and Nonresident Activity in the NIS/Forex Market,<sup>a</sup> 2000–2004**

	2004				(\$ million)			
	2001	2002	2003	2004				
Nonresident purchases of NIS assets (sale of forex assets) <i>Thereof: in basic account<sup>b</sup></i>	3,105	2,685	5,991	5,665	1,826	668	306	2,865
1. Investment in Israeli shares (in Israel and abroad)	4,094	2,198	4,183	4,986	2,423	853	212	1,498
1.1 Net direct investment in shares <sup>c</sup>	4,094	2,198	4,183	4,986	2,423	853	212	1,498
1.1.1 Net direct investment in shares <sup>c</sup>	3,518	1,760	3,762	1,493	635	506	-404	756
1.2 Net portfolio investment	576	438	421	3,493	1,788	347	616	742
2. NIS deposits less NIS credit	103	-65	122	123	-16	27	-13	127
2.1 Acceptance of NIS credit not indexed to forex (-)	59	-73	100	25	-23	-2	-25	75
2.1.1 Unindexed bank credit (-)	61	-86	23	-29	-23	-2	-21	17
2.1.2 CPI-indexed bank credit (-)	-1	13	77	54	-1	0	-4	58
2.2 Accrual in NIS deposits not indexed to forex	44	8	22	98	7	29	11	52
3. Net purchase of NIS bonds	-32	234	107	41	149	-207	27	72
3.1 Total government bonds	-33	233	108	39	149	-209	26	73
3.1.1 Unindexed government bonds	-3	209	-73	112	121	-46	-52	89
3.1.2 CPI-indexed government bonds	-22	0	11	39	10	8	7	14
3.1.3 Treasury bills	-7	25	170	-113	17	-170	70	-31
3.2 Private GPI-indexed bonds	0	1	0	2	0	2	1	0
4. Purchases of NIS assets via derivatives	-1,060	319	1,579	514	-730	-4	80	1,168
4.1 Forward purchases of NIS	-1,060	-55	1,544	-110	-392	-172	-117	571
4.2 Forward purchases of NIS options(OTC) <sup>d</sup>	-	374	35	624	-337	167	197	597
4.2.1 Call options	-	363	17	-103	-272	189	-37	17
4.2.2 Put options	-	11	19	727	-65	-22	234	580

<sup>a</sup> Purchases of forex (-) and sales of forex (+) include transactions denominated in and indexed to forex, NIS/forex forwards, and NIS/foreign-currency options.

<sup>b</sup> Investments in Israeli shares (in Israel and abroad) (Line 1 in this table).

<sup>c</sup> Including investments in real estate.

<sup>d</sup> In terms of delta (equivalent).

SOURCE: Based on reports by banks to the Bank of Israel.

**Part II Appendix Table 3**  
**Resident Purchases of NIS Assets and Resident Activity in the NIS/Forex Market,<sup>a</sup> 2000–2004**

	2004				(\$ million)			
	2001	2007	2008	2009		I	II	III
Sale of forex assets by residents	-575	-1,358	-4,864	-6,914	-3,177	-1,164	274	-2,847
<i>Thereof: in basic account<sup>b</sup></i>	-1,134	-1,320	-3,384	-2,221	-2,164	118	-198	22
1. Vis-à-vis nonresidents	-3,407	-4,267	-3,668	-4,383	-4,086	-610	260	53
1.1 Net direct investment in shares abroad (-)	130	102	-1,043	-2,131	-1,595	-18	-461	-58
1.2 Portfolio investment (-)	-1,483	-2,777	-1,776	-1,442	-1,518	-173	100	147
1.2.1 Foreign bonds (-) <sup>c</sup>	-1,062	-2,218	-854	-801	-995	2	200	-8
1.2.2 Shares (-)	-421	-558	-921	-642	-523	-174	-100	155
1.3 Credit from abroad	266	1,048	403	1,623	558	227	648	191
1.3.1 Direct credit	-48	46	-3	940	386	270	206	78
1.3.2 Israeli bonds abroad	100	159	-472	432	41	249	-10	152
1.3.3 Principals' loans from nonresidents to residents	117	10	178	125	-124	239	43	-32
1.3.4 Suppliers' credit	97	833	701	126	255	-531	409	-7
1.4 Accrual in deposits abroad (-)	-2,439	-1,890	266	-1,049	-384	-180	-342	-143
1.5 Forex credit to nonresidents (-)	120	-750	-1,518	-1,383	-1,147	-466	315	-85
1.5.1 Direct credit (-)	-335	-168	-159	-130	-177	-138	185	0
1.5.2 Principals' loans (-)	-677	-911	-963	-815	-172	-309	-61	-273
1.5.3 Customer credit (-)	1,132	328	-397	-438	-797	-19	190	188
2. In Israel, vis-à-vis banks and government	2,831	2,908	-1,196	-2,532	909	-554	14	-2,900
2.1 Investment in forex-indexed government bonds (-)	387	204	1,018	1,211	752	-53	611	-99
2.2 Bank credit	2,455	1,441	-711	-1,077	-411	-230	18	-454
2.2.1 Forex-denominated	2,570	1,221	-953	-1,430	-476	-314	-79	-561
2.2.2 Forex-indexed	-115	221	242	353	65	84	97	107
2.3 Accrual in forex deposits (-) <sup>d</sup>	6	108	-540	-1,735	-375	-620	98	-838
2.3.1 Forex-denominated	-49	-185	-921	-2,095	-354	-811	-15	-915
2.3.2 Forex-indexed	55	293	381	361	-21	191	113	78
2.4 Forward purchase of Foreign currency and options in NIS	-16	1,155	-963	-931	943	348	-713	-1,509
2.4.1 Forward purchases of foreign currency	-16	830	-396	-983	335	476	-499	-1,294
2.4.2 Forward purchases of foreign currency vir options(OTC) <sup>e</sup>	-	325	-567	52	608	-128	-214	-215
2.4.2.1 Call options	-	227	94	60	199	-160	-66	89
2.4.2.2 Put options	-	98	-661	-9	409	33	-147	-304

<sup>a</sup> Purchases of forex (-) and sale of forex (+), including forex-denominated and forex-indexed transactions, including NIS/forex options.

<sup>b</sup> Including resident direct and portfolio investment in shares abroad (net) (lines 1.1 and 1.2.2) and long-term credit (lines 1.3.1, 1.3.2, 1.3.3, 1.5.1 and 1.5.2).

<sup>c</sup> Includes cross-rate differentials in forex/forex forwards.

<sup>d</sup> Derived from balance differentials.

<sup>e</sup> In terms of delta (equivalent).

SOURCE: Based on reports by banks to the Bank of Israel.