

Chapter 8.B

Agricultural Production Targeting

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8.B.1 Background

Agricultural production targeting is a procedure applied to certain I-O tables before the main data construction phase. Except for its agricultural orientation, it is unrelated to the agricultural I-O data disaggregation discussed in sub-chapter 8.A of this chapter. Rather, it arises from concerns that arose with the GTAP 5 Data Base, that in the data for European Union (EU) member countries there were considerable inaccuracies in levels and international distribution of agricultural production, and, consequently, in the budgetary cost of assistance. This led to problems in analysis of EU agricultural reform.

Investigation revealed that these inaccuracies largely reflected discrepancies between the representation of agriculture in the contributed I-O tables for EU member countries (van Leeuwen, 2002) and EUROSTAT production data relied upon by EU stakeholders. These arose partly from differences in reference years (the I-O data being older), but more from basic data differences.

In response, a special version of the GTAP 5 Data Base was prepared for exclusive use of GTAP Consortium members, in which the agricultural production levels in EU member countries were revised. The revisions were made not within the data base construction procedure itself but as adjustments to the I-O tables entering into the procedure. In GTAP 6 Data Base, this targeting was incorporated for the first time into a public data release. Since then, Consortium members interested in agricultural policy analysis have pressed for the extension of the targeting to non-EU countries.

The EU tables processed in the initial application provided full GTAP sectoral detail, and the original implementation of the procedure relied on such provision. We now find ourselves applying it to regions whose contributed tables require disaggregation. Rather than enhance the procedure to remove this limitation, we work around it by performing a partial run of the main GTAP data construction procedure, up to and including I-O table fitting, input the fitted tables into the production targeting procedure. The tables input into the production targeting procedure are therefore fully disaggregated, and also cleaned and fitted. That they are fitted is not strictly necessary, but we hope that it may minimize the deviations from the production targets within the main build, discussed in sections 8.B.2 and 8.B.5 below. The tables output from the targeting procedure are then fed into a complete and final run of the main construction procedure.

The GTAP 10 Data Base employs agricultural production data for 53 countries (listed in table 8.B.1) sourced from Organization for Economic Cooperation and Development (OECD, 2018), and for twelve commodities (table 8.B.2) for 2014 base years. For 2007 and 2011 base years, Croatia is not subject to agricultural production targeting. For 2004 reference year, 50 countries undergo agricultural production targeting; Bulgaria, Croatia, and Romania, listed in the Table 8.B.1, are not subject to agricultural production targeting for these reference years.

Table 8.B.1 Countries Subject to Agricultural Production Targeting

| Code | Region Name | Code | Region Name |
|-------------|--------------------|-------------|--------------------|
| ARG | Argentina | ISR | Israel |
| AUS | Australia | ITA | Italy |
| AUT | Austria | JPN | Japan |
| BEL | Belgium | KAZ | Kazakhstan |
| BGR | Bulgaria | KOR | Korea |
| BRA | Brazil | LTU | Lithuania |
| CAN | Canada | LUX | Luxembourg |
| CHE | Switzerland | LVA | Latvia |
| CHL | Chile | MEX | Mexico |
| CHN | China | MLT | Malta |
| COL | Colombia | NLD | Netherlands |
| CRI | Costa Rica | NOR | Norway |
| CYP | Cyprus | NZL | New Zealand |
| CZE | Czech Republic | PHL | Philippines |
| DEU | Germany | POL | Poland |
| DNK | Denmark | PRT | Portugal |
| ESP | Spain | ROU | Romania |
| EST | Estonia | RUS | Russian Federation |
| FIN | Finland | SVK | Slovakia |
| FRA | France | SVN | Slovenia |
| GBR | United Kingdom | SWE | Sweden |
| GRC | Greece | TUR | Turkey |
| HRV | Croatia | UKR | Ukraine |
| HUN | Hungary | USA | United States |
| IND | India | VNM | Viet Nam |
| IDN | Indonesia | ZAF | South Africa |
| IRL | Ireland | | |

Table 8.B.2 Commodities Subject to Agricultural Production Targeting

| Code | Description | Code | Description |
|-------------|-------------------------|-------------|--|
| PDR | Paddy rice | C_B | Sugar cane, sugar beet |
| WHT | Wheat | OCR | Crops n.e.c. |
| GRO | Cereal grains n.e.c. | CTL | Bovine cattle, sheep and goats, horses |
| OSD | Oil seeds | OAP | Animal products n.e.c. |
| V_F | Vegetables, fruit, nuts | WOL | Wool, silk-worm cocoons |
| PFB | Plant based fibers | RMK | Raw Milk |

8.B.2 Overview

The purpose of the procedure is to adjust the I-O tables to match the agricultural production targets. But circumstances complicate the situation. The adjustment is done before the data base construction procedure, but parts of that procedure, especially I-O table fitting (chapter 15) affect agricultural production levels in the I-O tables. In some cases, the agricultural production targets are incompatible with other data targets, more specifically, with export targets. And since the procedure was originally designed to deal with raw I-O tables that have not undergone the cleaning procedures described in chapter 7, it contains safeguards against anomalous conditions that could abort processing.

In the data base construction process, there are many steps that affect agricultural production levels in the I-O data, but the main step is the fitting I-O tables to international datasets. Here again, there are many factors that affect agricultural production levels, but three of these are dominant: the targeting of GDP, exports, and production taxes. GDP targeting is achieved in effect by rescaling the whole I-O table, so it affects production levels for all commodities. Changes in exports entail corresponding changes in production levels. Changes in production tax rates imply changes in either input or output values; an increase in the production tax rate, for instance, can be achieved either by increasing the money value of output or by reducing the money values of the intermediate and factor inputs. In practice, it is achieved by a combination of the two, leaning toward output value changes for domestically-oriented sectors and input value changes for export-oriented sectors.

It would be futile to target production levels in the incoming I-O tables if these were then altered drastically by the GDP, export, and production tax targeting. We therefore anticipate these adjustments in the production level targeting: we adjust not the production levels only but GDP, exports, and production taxes also. The tables going into the FIT process should therefore require little adjustment in these variables; we may then hope that the FIT process will have little effect on agricultural production levels.

As the agricultural production targeting is done outside and before the main data construction procedure, it uses early versions of the macroeconomic, trade, and protection data. In particular, the trade data used in the production targeting is not the same as those finally used in GTAP 10 Data Base itself.

The attempt to anticipate the FIT export adjustments exposes another problem. In some cases, the export and agricultural production targets are simply incompatible. We encounter both *hard inconsistencies*, where the export target exceeds the production target, and *soft inconsistencies*, where the export target is lower than the production target, but still leaves very little domestic product available to the domestic market. Since the trade data are central to the whole data reconciliation process, in these cases, it is the production targets not the export targets that must give way. Accordingly, in such cases, we adjust the production targets before applying them to the I-O data.

To operationalize the concept of soft inconsistency, we deem a soft inconsistency to exist if the production target is less than the export target plus one quarter of the initial level of domestic absorption. But it would be meaningless to use the absorption level from the initial table, since that table may have any scale. So before testing for inconsistencies, we scale the I-O tables to match the GDP target. Having

identified the inconsistencies, we then adjust the inconsistent production targets to exports plus one quarter of initial domestic absorption. In other words, we permit the production targeting to remove no more than three quarters of initial domestic absorption.

The general outline of operations is therefore:

- Clean the I-O tables.
- Adjust the tables to match the GDP targets.
- Identify inconsistencies between export and production and export targets; adjust the production targets.
- Adjust the tables to match export, output subsidy, and agricultural production targets.

We discuss the handling of export-production inconsistencies further in section 8.B.3, and the production adjustments themselves in section 8.B.4. Finally, in section 8.B.5, we see how well the production targets are maintained in the data base construction program.

8.B.3 Export-Production Inconsistencies

For the 2004 base year, 145 targets are adjusted which is about 24 percent of the total. These include 86 adjustments for hard inconsistencies, and 59 for soft. An example of a hard inconsistency is the Canadian Wheat sector; here the production target of \$2,638 million is insufficient to cover exports of \$2,736 million. An example of a soft inconsistency is the Australian Paddy Rice sector; with production of \$74 million, we can accommodate exports of \$21 million but domestic absorption of \$305 is not possible. The number of inconsistencies increased for the 2007 base year to reach 155, about 25 percent of the total. The total number of hard target adjustments decreased slightly to 81. For the 2011 base year, the number of hard target adjustments increased to 115 with a total of 197, which is about 32 percent of total. For the 2014 reference year, 218 targets are adjusted, with 125 adjustments for hard inconsistencies and 93 adjustments for soft.

Although so many of the targets are adjusted, targets for many of the largest sectors undergo no adjustment. In fact, the total target, summed over sectors and countries, is increased by 5.5 per cent for 2004, 4.8 per cent in 2007, 6.4 percent for the 2011 and 7.4 per cent for 2014 base years. So, although the adjustments are quite severe in some individual cases, overall the targets are well maintained. For each reference year, China is accountable for at least 55 per cent of total target adjustment (e.g. out of 7.4 per cent of total target adjustment in 2014, 4.3 per cent is associated for adjustments in China).

Tables 8.B.3a, 8.B.3b, 8.B.3c and 8.B.3d report some of the notable adjustments for 2004, 2007, 2011 and 2014 base years, respectively. Here and in subsequent tables, we select the items for which changes or differences are more significant than others, where the criterion for “most significant” takes account both of the absolute magnitude of the item and the relative magnitude of the change or difference. We see that adjustments are more prevalent among non-EU countries, and for the commodities vegetables and fruits (*v_f*), oilseeds (*osd*), crops nec (*ocr*), wool (*wol*), and plant-based fibers (*pfb*).

Table 8.B.3a Production Target Adjustments for 2004: Selected Cases (US\$ million)

| GTAP Region | Sector | Domestic Absorption | Exports | Initial Production Target | Adjusted Production Target |
|--------------------|---------------|----------------------------|----------------|----------------------------------|-----------------------------------|
| Chn | v_f | 149337 | 2756 | 3332 | 40090 |
| Mex | v_f | 8712 | 3947 | 1864 | 6125 |
| Bra | ocr | 10635 | 3456 | 1925 | 6115 |
| Nld | osd | 48 | 563 | 2 | 575 |
| Nld | v_f | 1285 | 6047 | 3045 | 6368 |
| Aus | gro | 1545 | 1014 | 325 | 1401 |
| chl | v_f | 817 | 2270 | 996 | 2475 |
| zaf | v_f | 2750 | 1698 | 1120 | 2386 |
| nld | ocr | 6990 | 7429 | 6507 | 9176 |
| aus | wol | 5370 | 1421 | 1593 | 2763 |
| cri | v_f | 464 | 1674 | 905 | 1790 |
| col | v_f | 3112 | 992 | 950 | 1770 |
| kor | v_f | 11084 | 173 | 1885 | 2944 |
| can | v_f | 2151 | 1543 | 1217 | 2081 |
| vnm | v_f | 1485 | 582 | 477 | 953 |
| nld | gro | 619 | 110 | 60 | 265 |
| bel | osd | 37 | 84 | 7 | 93 |
| gbr | pfb | 62 | 39 | 2 | 55 |
| mex | osd | 453 | 22 | 28 | 135 |
| bel | v_f | 1219 | 1521 | 1318 | 1826 |
| jpn | gro | 1115 | 4 | 109 | 283 |
| tur | osd | 2111 | 67 | 325 | 595 |
| mex | ocr | 461 | 366 | 254 | 482 |
| cri | ocr | 21 | 343 | 163 | 349 |
| tur | ocr | 572 | 523 | 401 | 666 |
| can | wht | 2032 | 2736 | 2638 | 3244 |
| bel | wol | 3 | 22 | 0 | 23 |
| ita | pfb | 65 | 14 | 1 | 30 |
| bel | gro | 287 | 55 | 41 | 127 |

Table 8.B.3b Production Target Adjustments for 2007: Selected Cases (US\$ million)

| GTAP Region | Sector | Domestic Absorption | Exports | Initial Production Target | Adjusted Production Target |
|--------------------|---------------|----------------------------|----------------|----------------------------------|-----------------------------------|
| chn | v_f | 199417 | 4319 | 6179 | 54173 |
| mex | v_f | 11813 | 5484 | 1669 | 8437 |
| bra | ocr | 22210 | 5654 | 5144 | 11206 |
| nld | osd | 69 | 683 | 4 | 700 |
| zaf | v_f | 3604 | 2426 | 983 | 3327 |
| nld | v_f | 1669 | 8896 | 5401 | 9314 |
| chl | v_f | 1408 | 3319 | 1706 | 3671 |
| cri | v_f | 658 | 2637 | 1198 | 2801 |
| aus | pfb | 1519 | 513 | 212 | 893 |
| vnm | v_f | 2692 | 997 | 802 | 1670 |
| rus | v_f | 33892 | 169 | 6570 | 8642 |
| arg | gro | 997 | 2880 | 1941 | 3129 |
| kor | v_f | 12592 | 185 | 2262 | 3333 |
| tur | osd | 3489 | 112 | 460 | 984 |
| nld | ocr | 9028 | 9704 | 9939 | 11961 |
| aus | wol | 3860 | 1904 | 1932 | 2870 |
| nld | gro | 797 | 198 | 113 | 398 |
| col | v_f | 4265 | 1376 | 1605 | 2442 |
| bel | osd | 52 | 139 | 21 | 153 |
| mex | osd | 621 | 17 | 30 | 172 |
| tur | ocr | 950 | 600 | 455 | 838 |
| gbr | pfb | 82 | 35 | 1 | 56 |
| aus | pdr | 297 | 14 | 6 | 89 |
| can | v_f | 3393 | 2263 | 2380 | 3111 |
| vnm | ocr | 155 | 2305 | 1790 | 2344 |
| jpn | gro | 1039 | 1 | 102 | 261 |
| ita | pfb | 88 | 10 | 1 | 32 |
| bel | wol | 5 | 21 | 0 | 23 |
| cri | ocr | 30 | 402 | 230 | 409 |

Table 8.B.3c Production Target Adjustments for 2011: Selected Cases (US\$ million)

| GTAP Region | Sector | Domestic Absorption | Exports | Initial Production Target | Adjusted Production Target |
|--------------------|---------------|----------------------------|----------------|----------------------------------|-----------------------------------|
| chn | v_f | 409613 | 8232 | 24824 | 110635 |
| mex | v_f | 13234 | 8067 | 1397 | 11376 |
| nld | v_f | 1776 | 10333 | 3633 | 10777 |
| ita | wol | 28 | 1391 | 11 | 1398 |
| nld | osd | 73 | 809 | 2 | 827 |
| arg | gro | 1688 | 5298 | 2493 | 5720 |
| deu | wol | 26 | 571 | 6 | 577 |
| nld | ocr | 9624 | 10303 | 7819 | 12709 |
| cze | wol | 2 | 301 | 0 | 301 |
| zaf | v_f | 5014 | 2606 | 1715 | 3859 |
| vnm | v_f | 4715 | 2228 | 1520 | 3407 |
| esp | v_f | 10504 | 12008 | 10454 | 14634 |
| usa | pfb | 6382 | 8422 | 6989 | 10018 |
| pol | wol | 5 | 188 | 1 | 190 |
| bra | ocr | 41577 | 8392 | 14825 | 18786 |
| chl | v_f | 2040 | 4271 | 2916 | 4781 |
| can | v_f | 4140 | 3541 | 2835 | 4576 |
| aus | wol | 6287 | 2920 | 2821 | 4492 |
| bel | wol | 6 | 110 | 0 | 112 |
| bel | pfb | 28 | 215 | 7 | 222 |
| rus | v_f | 49672 | 250 | 9811 | 12668 |
| nld | gro | 846 | 215 | 62 | 427 |
| tur | ocr | 1137 | 589 | 283 | 873 |
| fra | wol | 20 | 147 | 3 | 152 |
| gbr | wol | 50 | 325 | 43 | 338 |
| arg | v_f | 3384 | 1781 | 1580 | 2627 |
| ita | pfb | 91 | 59 | 0 | 81 |
| bgr | wol | 2 | 106 | 1 | 107 |
| col | v_f | 6898 | 1599 | 2223 | 3323 |

Table 8.B.3d Production Target Adjustments for 2014: Selected Cases (US\$ million)

| GTAP Region | Sector | Domestic Absorption | Exports | Initial Production Target | Adjusted Production Target |
|--------------------|---------------|----------------------------|----------------|----------------------------------|-----------------------------------|
| chn | v_f | 315601 | 8177 | 31539 | 87077 |
| chn | osd | 216854 | 1161 | 20804 | 55374 |
| mex | v_f | 14709 | 10712 | 2016 | 14389 |
| chn | wol | 83038 | 3883 | 6695 | 24643 |
| nld | osd | 74 | 1222 | 7 | 1240 |
| nld | v_f | 1757 | 10388 | 4173 | 10828 |
| ita | wol | 27 | 1216 | 11 | 1223 |
| bra | ocr | 38414 | 6483 | 9473 | 16086 |
| rus | v_f | 52968 | 349 | 8116 | 13591 |
| deu | wol | 27 | 497 | 3 | 504 |
| zaf | v_f | 4215 | 3357 | 1745 | 4411 |
| vnm | v_f | 6475 | 2914 | 1942 | 4532 |
| cze | wol | 2 | 305 | 0 | 306 |
| nld | ocr | 9446 | 9489 | 7856 | 11851 |
| kor | gro | 3289 | 1 | 89 | 823 |
| chl | v_f | 2107 | 5701 | 3500 | 6228 |
| chn | pfb | 68100 | 374 | 12750 | 17399 |
| esp | v_f | 9767 | 14012 | 12259 | 16453 |
| aus | pfb | 2592 | 1861 | 1082 | 2509 |
| can | v_f | 4146 | 4442 | 3301 | 5479 |
| arg | gro | 1664 | 4473 | 2878 | 4889 |
| rus | gro | 26230 | 1504 | 5687 | 8061 |
| pol | wol | 5 | 151 | 1 | 152 |
| nld | gro | 841 | 227 | 65 | 438 |
| tur | ocr | 1169 | 813 | 403 | 1105 |
| gbr | wol | 59 | 330 | 38 | 345 |
| bel | wol | 6 | 98 | 0 | 99 |
| aus | wol | 6582 | 2189 | 2412 | 3834 |
| cri | v_f | 1239 | 2990 | 2103 | 3300 |

8.B.4 Production Adjustments

Table 8.B.4a, 8.B.4b, 8.B.4c and 8.B.4d show the effects of the production adjustments for the four base years respectively. We compare the production level after GDP scaling (third column) to the adjusted production targets (fifth column). We also report the production levels obtained without the export and production subsidy adjustments been applied (fourth column).

We find that the largest adjustments are concentrated in a few countries, in China, Russia, India and United States. Large adjustments are especially common for vegetables, fruit and nuts (*v_f*), other crops (*ocr*) and cattle (*ctl*). Although there are some upward adjustments (for example, *v_f*, in Brazil in 2014), most adjustments are downward. Overall, in the countries subject to targeting, agricultural production falls by 29 per cent for 2004 base year; by 23 per cent for the 2007 base year, by 26 per cent for the 2011 base year and by 30 per cent for 2014 base year.

Table 8.B.4a Production Adjustments for 2004: Selected Cases (US\$ million)

| GTAP Region | Sector | Scaled | Without Production Adjustments | With Production Adjustments |
|-------------|--------|--------|--------------------------------|-----------------------------|
| chn | v_f | 154403 | 3332 | 40090 |
| usa | ctl | 92499 | 35161 | 35161 |
| usa | gro | 62095 | 25827 | 25827 |
| ind | v_f | 37213 | 13170 | 13170 |
| jpn | v_f | 29299 | 10390 | 10390 |
| usa | ocr | 21267 | 7432 | 7551 |
| rus | v_f | 15669 | 4557 | 4557 |
| tur | v_f | 19000 | 6791 | 6791 |
| kor | v_f | 11272 | 1885 | 2944 |
| ind | oap | 9604 | 2794 | 2794 |
| idn | v_f | 7991 | 2174 | 2206 |
| ind | osd | 12149 | 4622 | 4622 |
| rus | gro | 7798 | 2560 | 2560 |
| rus | rmk | 13708 | 6437 | 6437 |
| gbr | ocr | 5892 | 1716 | 1716 |
| usa | rmk | 39808 | 27429 | 27429 |
| bra | ocr | 12513 | 1925 | 6115 |
| ind | rmk | 28774 | 18494 | 18494 |
| chn | ctl | 9980 | 17503 | 17503 |
| ind | gro | 5052 | 1581 | 1581 |

Table 8.B.4b Production Adjustments for 2007: Selected Cases (US\$ million)

| GTAP Region | Sector | Scaled | Without Production Adjustments | With Production Adjustments |
|-------------|--------|--------|--------------------------------|-----------------------------|
| chn | v_f | 205398 | 6179 | 54173 |
| usa | ctl | 108889 | 40786 | 40786 |
| rus | v_f | 34463 | 6570 | 8642 |
| ind | v_f | 55493 | 23181 | 23181 |
| tur | v_f | 31361 | 10291 | 10291 |
| rus | rmk | 30157 | 10518 | 10518 |
| jpn | v_f | 27445 | 9499 | 9499 |
| rus | gro | 17142 | 4620 | 4655 |
| usa | ocr | 25152 | 9574 | 9574 |
| kor | v_f | 12824 | 2262 | 3333 |
| bra | ocr | 26125 | 5144 | 11206 |
| idn | v_f | 13455 | 3454 | 3701 |
| aus | ocr | 104 | 3576 | 3576 |
| ind | oap | 14326 | 4719 | 4719 |
| aus | oap | 10518 | 2516 | 2699 |
| ind | osd | 17659 | 6982 | 6982 |
| ind | pdr | 16086 | 30335 | 30335 |
| chn | gro | 17652 | 30489 | 30489 |
| rus | ctl | 12276 | 4932 | 4932 |
| gbr | ocr | 7621 | 2224 | 2224 |

Table 8.B.4c Production Adjustments for 2011: Selected Cases (US\$ million)

| GTAP Region | Sector | Scaled | Without Production Adjustments | With Production Adjustments |
|-------------|--------|--------|--------------------------------|-----------------------------|
| chn | v_f | 420221 | 24824 | 110635 |
| usa | ctl | 116564 | 50379 | 50379 |
| rus | v_f | 50505 | 9811 | 12668 |
| chn | ocr | 3749 | 26254 | 26254 |
| ind | v_f | 82252 | 35578 | 35578 |
| rus | rmk | 44197 | 15001 | 15001 |
| jpn | v_f | 41195 | 13533 | 13533 |
| bra | ocr | 48904 | 14825 | 18786 |
| tur | v_f | 37548 | 12209 | 12480 |
| idn | v_f | 27800 | 7004 | 7528 |
| chn | ctl | 28453 | 60595 | 60595 |
| rus | gro | 25119 | 5481 | 6829 |
| chn | gro | 36058 | 69360 | 69360 |
| ind | osd | 26173 | 8912 | 8912 |
| aus | oap | 17140 | 3709 | 4324 |
| ita | ocr | 17661 | 5174 | 5238 |
| chn | oap | 329992 | 267634 | 267634 |
| kor | v_f | 13312 | 3142 | 3524 |
| rus | ctl | 17992 | 6316 | 6316 |
| ind | oap | 21239 | 8296 | 8296 |

Table 8.B.4d Production Adjustments for 2014: Selected Cases (US\$ million)

| GTAP Region | Sector | Scaled | Without Production Adjustments | With Production Adjustments |
|------------------------|---------------|---------------|---------------------------------------|------------------------------------|
| chn | v_f | 323304 | 31539 | 87077 |
| chn | osd | 217180 | 20804 | 55374 |
| chn | ocr | 2428 | 32486 | 32486 |
| chn | ctl | 188154 | 88569 | 88569 |
| chn | wol | 83053 | 6695 | 24643 |
| chn | pfb | 68396 | 12750 | 17399 |
| rus | v_f | 53867 | 8116 | 13591 |
| usa | ctl | 130838 | 62482 | 62482 |
| bra | v_f | 7098 | 32593 | 32593 |
| rus | rmk | 47142 | 15244 | 15244 |
| ind | v_f | 91512 | 46278 | 46278 |
| bra | ocr | 45186 | 9473 | 16086 |
| tur | v_f | 38719 | 12276 | 13207 |
| idn | v_f | 27726 | 6790 | 7668 |
| ind | osd | 29122 | 8286 | 8623 |
| jpn | v_f | 32123 | 10545 | 10545 |
| rus | gro | 26802 | 5687 | 8061 |
| aus | oap | 17943 | 4045 | 4550 |
| rus | ctl | 19185 | 5438 | 5438 |
| usa | ocr | 30029 | 12051 | 12051 |

8.B.5 *Deviations from Targets in the Main Data Base Construction Program*

As noted above, the production adjustment is performed before the main data construction program. The adjusted targets are attained quite accurately within the adjustment program itself, but nothing in the main program guarantees that they will be maintained through the regular I-O processing. In tables 8.B.5a, 8.B.5b, 8.B.5c and 8.B.5d therefore, we examine the largest deviations between the production targets and the final data.

Overall, deviations from target are not extreme. Some exceptions include Russia and Ukraine for 2004; China, Indian, Russia and USA for 2007; Ukraine, Argentina and Indonesia for 2011; Argentina, Indonesia and China for 2014. Bearing in mind that the differences presented are those considered most serious, we may say that the targets are well maintained. There is a slight general downward bias in the errors: overall, agricultural production for the targeted countries are below target by only 2.4 per cent for 2004, 3.4 per cent in 2011 and 3.5 per cent for the 2014 base years. Much larger deviation is observed for the 2007 reference year, with an upward 23.4 per cent adjustment. Over quarter of this adjustment is associated with changes in v_f production in China.

Table 8.B.5a Deviations from Production Targets for 2004: Selected Cases (US\$ million)

| GTAP Region | Sector | Target | Final |
|-------------|--------|--------|-------|
| rus | oap | 6970 | 4341 |
| ukr | v_f | 2381 | 1086 |
| ukr | rmk | 2047 | 877 |
| arg | oap | 965 | 2083 |
| ukr | oap | 1955 | 915 |
| rus | rmk | 6437 | 4504 |
| rus | wht | 5115 | 3507 |
| rus | gro | 2560 | 1477 |
| aus | osd | 504 | 1189 |
| ukr | wht | 1623 | 812 |
| esp | osd | 2402 | 3656 |
| rus | v_f | 4557 | 3201 |
| rus | ctl | 2680 | 1746 |
| ind | ocr | 21204 | 18490 |
| ukr | ctl | 793 | 349 |
| ukr | gro | 1723 | 1050 |
| grc | osd | 1047 | 1710 |
| ita | osd | 2350 | 3265 |
| usa | gro | 25827 | 23358 |
| ind | osd | 4622 | 3626 |

Table 8.B.5b Deviations from Production Targets for 2007: Selected Cases (US\$ million)

| GTAP Region | Sector | Target | Final |
|-------------|--------|--------|--------|
| chn | v_f | 54173 | 191538 |
| rus | v_f | 8642 | 31956 |
| usa | ctl | 40786 | 83181 |
| tur | v_f | 10291 | 33792 |
| ind | v_f | 23181 | 54706 |
| bra | ocr | 11206 | 28302 |
| usa | ocr | 9574 | 25645 |
| rus | rmk | 10518 | 26269 |
| jpn | v_f | 9499 | 24154 |
| chn | gro | 30489 | 14256 |
| rus | gro | 4655 | 14524 |
| gbr | ocr | 2224 | 9535 |
| kor | v_f | 3333 | 11636 |
| ind | oap | 4719 | 13561 |
| ind | pdr | 30335 | 16001 |
| ind | osd | 6982 | 16918 |
| idn | v_f | 3701 | 11215 |
| usa | v_f | 60350 | 40364 |
| aus | ocr | 3576 | 377 |
| aus | oap | 2699 | 8585 |

Table 8.B.5c Deviations from Production Targets for 2011: Selected Cases (US\$ million)

| GTAP Region | Sector | Target | Final |
|-------------|--------|--------|-------|
| arg | oap | 3777 | 8980 |
| idn | pdr | 30368 | 22407 |
| ukr | v_f | 7226 | 4776 |
| ukr | rmk | 3807 | 2242 |
| jpn | ctl | 5527 | 3666 |
| usa | gro | 78697 | 71689 |
| ukr | oap | 4806 | 3214 |
| chn | osd | 18502 | 15722 |
| idn | oap | 10346 | 8394 |
| ukr | gro | 5649 | 4341 |
| idn | v_f | 7528 | 6011 |
| chn | gro | 69360 | 64677 |
| arg | gro | 5720 | 7141 |
| ukr | wht | 3735 | 2731 |
| ukr | ctl | 1264 | 718 |
| idn | gro | 6257 | 4954 |
| idn | osd | 16166 | 14056 |
| nor | ocr | 1085 | 1723 |
| vnm | pdr | 13398 | 11526 |
| rus | oap | 19872 | 17581 |

Table 8.B.5d

Deviations from Production Targets for 2014: Selected Cases (US\$ million)

| GTAP Region | Sector | Target | Final |
|-------------|--------|--------|--------|
| arg | oap | 4503 | 10653 |
| idn | pdr | 28829 | 21418 |
| chn | oap | 266561 | 250755 |
| jpn | ctl | 5196 | 3327 |
| usa | gro | 55303 | 50541 |
| chn | gro | 90700 | 84687 |
| rus | oap | 21277 | 18422 |
| idn | oap | 9985 | 8105 |
| nor | ocr | 1192 | 1958 |
| ukr | v_f | 5670 | 4324 |
| idn | osd | 18002 | 15570 |
| chn | v_f | 87077 | 81734 |
| chn | ocr | 32486 | 29260 |
| arg | ctl | 9566 | 7859 |
| idn | v_f | 7668 | 6175 |
| idn | gro | 6825 | 5465 |
| ind | ctl | 11595 | 9830 |
| arg | gro | 4889 | 6077 |
| ukr | rmk | 2913 | 2125 |
| bra | oap | 23880 | 21577 |

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