Distribution of Net External Assets in Regions and States of the U.S.A.*

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Abstract

We present rough estimates of net external assets for regions and states of the United States. These estimates have been derived from the data on gross state product and state personal income. We identify the largest creditors and debtors and observe relatively important disparities in net external assets across the states and regions.

Keywords: gross state product; net external assets; regions and states of the U.S.A.; state personal income

JEL classification: C82; F34; F41

1. Introduction

Net external assets (NEA) constitute a fundamental macroeconomic variable. NEA determine a position of an economy on the international credit market: a positive value of NEA indicates net creditors, while a negative value indicates net debtors. Developed economies are both net creditors (Japan, Switzerland) and net debtors (Australia, Canada). Developing countries are typically net debtors. Oil exporting countries are frequently strong

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net creditors.

NEA are connected with the current account of the balance of payments. The current account shows the change of NEA. A current-account surplus theoretically leads to an increase of NEA, whereas a current-account deficit is associated with a decline of NEA. Many transition economies today have high current-account deficits; this means that these economies are borrowing internationally and their NEA go down. In reality the association between NEA and the current account may not be precise – for example, NEA may be influenced by asset-valuation changes, which is not reflected in the current account.

Important previous studies on NEA include Sinn (1990), Duczynski (2000), and Lane and Milesi-Ferretti (2001). Sinn constructs NEA estimates for 145 countries from the balance sheets of central banks, deposit money banks, private households and firms, and public authorities in the 1970-1987 period. Duczynski examines whether countries and U.S. states have a tendency to be credit constrained. Lane and Milesi-Ferretti construct estimates of external assets and liabilities for 67 industrial and developing countries. Among other things, they examine trends in NEA and shifts in debt-equity ratios over time.

This contribution constructs estimates of NEA for 51 states and 8 regions of the United States for 1980, 1990, and 2000. A full database for the 1977-2001 period is available from me as shareware in an Excel file (where the NEA-to-GSP ratios are expressed in percentage terms). The construction of NEA estimates is based on the data on gross state product (GSP) and state personal income (SPI). GSP is related to produced income (an analogy of GDP), whereas SPI has a rough analogy in GNP (received income). All necessary data are available from various issues of the *Survey of Current Business* and from the web site of the U.S. Department of Commerce, Bureau of Economic Analysis (http://www.bea.gov). The database starts in 1977 since the necessary components of GSP are not available for earlier years.

2. The NEA estimates

The computation of NEA uses estimates of received property income (derived from SPI) and produced property income (derived from GSP). The received property income consists of the estimate of net interest, rental income of persons, proprietors' income, and the estimate of corporate profits. SPI does not directly contain net interest, nor does it contain corporate profits. Nevertheless, SPI contains personal interest income and personal dividend income. We obtained the estimate of net interest from the personal interest income using the ratios of

these variables at the U.S. level. The ratios of net interest to personal interest income at the level of the United States amounted to 0.70 in 1980, 0.64 in 1990, and 0.57 in 2000. The personal interest income exceeds the net interest : the personal interest income consists of the net interest, the interest paid by persons, and the government interest. With the given adjustment of the personal interest income to the net interest we got estimates of NEA in which the federal government debt was allocated to U.S. states.

We obtained the estimate of corporate profits from the personal dividend income (again with the use of the ratios of these variables at the U.S. level). The ratios of corporate profits to personal dividend income were 3.11 in 1980, 3.00 in 1990, and 2.10 in 2000.

The produced property income was derived from the property-type GSP. The property-type GSP contains the depreciation of capital. Estimates of capital depreciation for individual U.S. states are not available. The ratios of the produced property income (with no depreciation) to the property-type GSP at the U.S. level amounted to 0.64 in 1980, 0.67 in 1990, and 0.65 in 2000. These ratios were used in the construction of the estimates of the produced property income for individual regions and states.

The computation of NEA for individual regions and states was based on the following formula (see Duczynski, 2000):

$$NEA/GSP = (R-1)K/GSP, \qquad (1)$$

where R is the ratio of received to produced property income and K is the value of physical capital. We assume the same rate of return inside and outside each region and state. R is then the ratio of all assets to domestic physical capital. R-1 is then equal to the ratio of NEA to physical capital. The ratios of capital to GSP for individual states are not available. The *Survey of Current Business* presents estimates of private physical capital (fixed reproducible tangible wealth) for the United States. We allocated physical capital to individual states in proportions to the property-type GSP. From equation (1) we obtained preliminary estimates of NEA/GSP. The given procedure was also applied to the United States as a whole and the resulting preliminary NEA estimates were compared to the estimates of NEA presented in the *International Financial Statistics* (2002). We computed differences between the NEA/GSP estimates from the *International Financial Statistics* and our preliminary estimates for the United States. We added the given differences to the preliminary estimates of NEA/GSP for individual regions and states. By this relatively small correction we got aggregate-consistent

estimates of NEA/GSP for regions and states – the sum of NEA across states or regions should correspond to the overall position of the United States.

The final estimates of NEA/GSP for 8 regions and 51 states are presented in Table 1. Regions are denoted by boldface italics. The computation of NEA involved numerous approximations; consequently, the given estimates are only rough estimates.

The estimates from a broader database in the 1977-2001 period may be compared with my previous estimates for 1977, 1982, 1987, and 1992 (see Duczynski, 2000). These earlier estimates for the U.S. states used a more precise determination of capital depreciation (the depreciation was allocated to states according to sectors – this was a relatively demanding procedure). On the other hand, these earlier estimates were affected by the disparity between the personal interest income and the net interest. If we regress the new (preliminary) estimates on the old estimates, we get

$$(NEA/GSP)_2 = 0.81\ (NEA/GSP)_1, \qquad (2)$$

where R^2=0.96, the t-statistic reaches 66.8 and the number of observations is n=204 (51 states times 4 years). This is an extraordinarily strong correlation, which indicates that a less precise determination of depreciation in new estimates does not substantially change the result. Nevertheless, the old estimates should be re-scaled by a factor of approximately 0.81. The old estimates did not correct the personal interest income to the net interest, which induced an upward bias of the received property income. In Duczynski (2000) I carried out a correction of the preliminary estimates for aggregate consistency. I did not realize that the aggregate consistency would not by itself solve the problem; the final estimates were extended (they were higher in absolute value than the true estimates).

The database of the NEA/GSP values provides relatively good information on capital flows within the United States. The United States experienced a significant capital inflow (a decline of NEA) between 1980 and 2000 – they moved from a position of a moderate creditor to a position of a moderate debtor. (Table 1 presents corresponding data from the *International Financial Statistics*.) We observe a strong capital inflow into New England and the Mideast, while a capital outflow was important in the Southwest (in particular in Oklahoma and Texas) and in the Rocky Mountain (in particular in Montana and Wyoming). Undoubtedly, Florida is the strongest net creditor. Maine and Vermont are other important creditors. Alabama, Alaska, Georgia, Louisiana, Mississippi, New Mexico, North Carolina,

Texas, Utah, West Virginia, and Wyoming are important net debtors. Barro et al. (1995) work with a model of credit-constrained economies which they also apply to U.S. states. The most heavily indebted states are the candidates for being credit constrained (Alaska, Louisiana, New Mexico in 1980 and 2000, Texas, Utah, and Wyoming in 1980 and 1990).

The frequency of net creditors among the U.S. states was 25 in 1980, 26 in 1990, and only 12 in 2000. This decline is connected with the flow of foreign capital to the United States. The most rapid growth of NEA/GSP from 1980 to 2000 was for the Southwest among the regions (growth by 0.45) and for Wyoming among the states (growth by 1.82). We observe the largest decline of NEA/GSP in the given period for New England among the regions (a decline by 1.11) and for Delaware among the states (a decline by 1.54).

Table 1 and generally all the database of NEA/GSP show relatively important dispersions of NEA among the states. The given database can be used in future research. For example, in Duczynski and Tóthová (2002) we show that rich U.S. states have a tendency to be net debtors, whereas in international comparisons rich countries are on average net creditors. The growth of NEA (a capital outflow) is negatively correlated with the growth of product among the U.S. states, while the given correlation is positive among the countries. This is a certain indication that international capital flows may have been inefficient (a capital inflow was connected with slow product growth). It is likely that the capital flows across U.S. states were more efficient than international capital flows.

In the end we can note that this contribution analyzes positions of the private sector of states and regions. In other words, we abstract from the positions of local governments. Fiscal positions of U.S. states are, for example, analyzed in Bayoumi et al. (1995).

3. Conclusion

This contribution presents rough estimates of net external assets for 8 regions and 51 states of the United States for 1980, 1990, and 2000. A broader database for the 1977-2001 period is available from the author upon request. The given estimates have been constructed from the data on gross state product and state personal income. The estimates of net external assets provide information on capital flows among the U.S. states, and they can be used in future research. We have identified the most important debtors and creditors and revealed a relatively high dispersion of net external assets among individual states.

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Table 1: Net external assets in relation to gross state product for regions and states of the United States.

	1980	1990	2000
U.S.A.	0.13	-0.03	-0.22
New England	0.96	0.24	-0.15
Connecticut	1.40	0.33	-0.08
Maine	0.81	0.47	0.10
Massachusetts	0.79	0.12	-0.11
New Hampshire	0.73	0.52	-0.53
Rhode Island	0.73	0.10	-0.68
Vermont	1.00	0.43	0.33
Mideast	0.55	0.17	-0.16
Delaware	0.39	-0.69	-1.15
District of Columbia	0.06	-0.26	-0.28
Maryland	0.51	0.03	0.00
New Jersey	0.76	0.22	-0.18
New York	0.61	0.09	-0.18
Pennsylvania	0.54	0.51	-0.07
Great Lakes	0.28	0.11	-0.07
Illinois	0.33	0.19	0.08
Indiana	0.15	-0.06	-0.26
Michigan	0.55	0.36	0.03
Ohio	0.08	-0.07	-0.28
Wisconsin	0.23	0.03	0.00
Plains	-0.03	0.10	0.02
Iowa	-0.29	-0.05	-0.10
Kansas	-0.10	0.01	-0.07
Minnesota	0.00	0.05	0.19
Missouri	0.45	0.24	-0.11
Nebraska	-0.14	0.14	0.07
North Dakota	-1.53	0.10	0.18
South Dakota	-0.22	0.11	0.13

Southeast	-0.08	-0.08	-0.18
Alabama	-0.44	-0.32	-0.37
Arkansas	-0.33	-0.28	-0.21
Florida	1.83	1.24	0.84
Georgia	-0.32	-0.33	-0.41
Kentucky	-0.25	-0.36	-0.45
Louisiana	-2.01	-1.41	-0.87
Mississippi	-0.79	-0.55	-0.40
North Carolina	-0.33	-0.55	-0.64
South Carolina	-0.17	-0.40	-0.39
Tennessee	-0.17	-0.19	-0.47
Virginia	0.18	-0.15	-0.28
West Virginia	-0.56	-0.26	-0.38
Southwest	-0.84	-0.39	-0.39
Arizona	0.48	0.38	-0.28
New Mexico	-1.01	-0.18	-1.13
Oklahoma	-0.62	-0.19	0.02
Texas	-1.04	-0.56	-0.41
Rocky Mountain	-0.38	-0.04	-0.07
Colorado	0.12	0.23	0.15
Idaho	-0.08	0.31	-0.19
Montana	-0.48	0.53	0.42
Utah	-0.52	-0.47	-0.64
Wyoming	-2.11	-1.51	-0.29
Far West	0.26	-0.27	-0.28
Alaska	-2.98	-2.51	-1.26
California	0.42	-0.27	-0.26
Hawaii	0.00	-0.61	-0.39
Nevada	-0.20	-0.17	-0.13
Oregon	0.18	0.21	-0.60
Washington	0.36	0.09	-0.07