NATIONAL ACCOUNTS OF ROBINSON´S ECONOMY

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Abstract

The system of national accounts provides data for economic analysis, especially analysis of business cycle. While properties of time series are continually under discussion, much less formation and predicative ability of the aggregates. Aim of this paper is to contribute to activation of this discussion, to draw the attention on possible weak points in the relationship between the national accounts system and business cycle. These points refer to key concepts of the system of national accounts as a value-added approach, production-borders, recording of capital goods, disposable income definition, definition of savings or the strong concentration on the consumption. In the paper, we use the model of the economy of Robinson Crusoe that enable us to record the effects of economic activity from the very beginning and to show the effects of this activity on the aggregates of the national accounts system.

Keywords: national accounts, business cycle, value-added, savings, capital goods, wealth effect

JEL Classification: E01, E20, E30

Foreword

The national accounts system (SNA) became indispensable part of economic policy. The SNA provides data for economic analysis, macro-predictions or business cycle analysis. But the SNA is not neutral description of economy; the way of arrangement of macro-aggregates in the SNA represents the Keynesian view of economy[1]. This fact is not surprising; pioneers of the national accounts were Lord Keynes, and his followers Simon Kuznets and Richard Stone, both Keynesian economists and also Nobel laureates. Thus, by use of balance items of the SNA as GDP or GNI for business cycle analysis, we implicitly accept Keynesian economics as the most successful theory in explanation of business cycles movements.

Key feature of Keynesian economics is suppression the importance of capital, this fact is fully reflected in the SNA. Restricted recording of capital is represented by use of value added concept and definition of disposable income that are in the center of the SNA. As we will show later, this methodology of aggregates can leave fundamental processes in economy hidden. Owing to continuity of the SNA concepts, this will also hold true in the future. Thus, we can identify certain

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[1] First attempt to record flows in economy is dated back to 18th century namely to Francois Quesnay.

dichotomy in the relation of business cycle and the SNA. While use of data and interpretation of characteristics of time series are still under discussion, compilation of data and concept of the SNA is in essence kept unchanged.

Following text is a modest contribution aiming at fill this gap. Questionable concepts of the SNA and their linkage to business cycle analysis are demonstrated on the example of Robinson´s economy. The reason for this choice lies in the fact that this model makes it possible to proceed from the very beginning of economic activity to more complicated phenomenon of common economic life and, above all, to be very illustrative. It is naturally important to mention, that analysis of the Robinson´s economy follows the actual methodology of the SNA, as well as revised methodology that will enter in force in the future.

1. Methodology

Use of Robinson's economy model needs to solve methodological difficulties or to accept some compromises that will not misapply our model to economic science and the SNA simultaneously. There are two substantial problems, production boundary and valuation issue. Inevitably, by focusing on Robinson´s economic activity we will deal largely with his production for final use. By it, we are getting out of production boundaries, as it is defined in the SNA. But this does not contradict to the fact that these activities[2] are commonly exercised by households (as Robinson), because they are necessary for sustenance of theirs living standard.

As was already mentioned, these activities are ignored in reality of the SNA. This is based two reasoning[3]. The first one is usual problem with data availability. The second one is the difficulty with valuation of products resulting from these activities. As Kuznets itself admits, even if we ignore these activities from practical reasons, these activities are productive[4]. So, we can afford to include these activities in our analysis of the SNA concepts. The problem with data availability can also be easily overcome; we will simply make assumption on Robinson´s economic activities aiming at survive in the wild nature. Thus, we are in such position that we dispose of micro-data on individual activities. But, the second problem of valuation still remains to solve.

Robinson´s products are not traded (before next individuals will enter the analysis and market come into existence), thus there are no market prices. Purpose of this text is to explain basic concepts of the SNA and the link of this concept to business cycle analysis. First, we use for valuation of products the commodity that can most satisfy Robinson´s needs. According to our assumption, this commodity will be bananas. In the first days of Robinson´s life on island, we suppose Robinson

[2] For example cooking, washing, custody of children; if these products or services are not purchased on the market.
[3] Kuznets [1941], p.9
[4] Dtto.

to consume just this one commodity (banana). All consumer goods then exchanged on the market will be valued by use of this commodity.

But for production of more time-consuming products with longer period of production, Robinson needs to dispose of capital goods. We do not miss the aim of this paper, if we will evaluate the capital goods on the base of opportunity costs, even if this concept is to SNA fully unknown currently[5]. Thus, we choose the method that evaluates the capital goods on the base of costs and as costs will be understood the amount of consumption goods that could be produced instead of capital goods production. Capital goods are then expressed as a value of primary inputs and opportunity costs of theirs production.

2. Life on desert island

Let´s move on our island. Robinson´s ship has gone to wreck and his passenger is now left to himself on the deserted island. We are starting on the first day of his involuntary stay, when Robinson begin to think about allocation of his resources (time), using of his knowledge and available natural resources to satisfy his physical needs. In such situation, he plan naturally produce consumption goods. Suppose that Robinson picks 10 bananas, which are sufficient for his first-day needs. The rest of his time is devoted to relaxation after physically demanding ship-wreck. Table 1 records the effects of Robinson´s activities on the national accounts aggregates of our economy.

Table 1: First day (t)

Production account			
Intermediate consum.	0	Production[6]	10
Value added	10		
Generation of Income Account			
Wages	0	Value added	10
Mixed Income	10		
Use of Income Account			
Final consumption	10	Disposable Income	10
Savings	0		

In our simplified sequence of account, there are displayed only those accounts that are affected by the economic activity of Robinson on the first day. As we can

[5] In the study of Ruger and Varjonen [2008], non-paid work of households is evaluated by opportunity costs, if there is not a market equivalent (market replacement cost method), p. 19. In addition, cost method is standard procedure of evaluation of government and non-profit institution, see ESA95. Question of expansion of production boundaries is discussed in Eisner [1988]

[6] Production in the SNA is based on the neoclassical definition of productive activities, i.e. „all potentially marketable activities...", see Shaikh, Tonak [1994], p. 3. Keynesian economics took over this convention and this concept was integrated into national accounts. For interesting discussion of economic activity definition see Ogle [2002], Holcombe [2004], Eisner [1988], Rothbard [1963].

read, the result of Robinson´s activity is value-added amounting to 10 (bananas). There is no intermediate consumption, because the only input was "time" that is not assessed in the SNA[7]. Thus, labour is now the only production factor. This fact is not so evident from the entries on "Generation of Income Account", because "Mixed Income" is mixed because of payments to capital and labour inputs put together that is specific case of households´ productive activities. Due to urgency of needs and thus high time preference, total income is allocated to final consumption (see Use of Income Account).

Table 2: Second day, occurrence of exchange(t+1)

Production Account			
Intermediate consum.	0	Production	20
		R: for own use	5
		for exchange	5
		P: for own use	5
		for exchange	5
Value added	20		
Generation of Income Account			
Wages	0	Value Added	20
Mixed Income	20		
Use of Income Account			
Final consumption	20	Disposable Income	20
Savings	0		

On the next day Friday has appeared on the island. He is using his skills and shape for fishing. Thus, suppose that Friday crops 10 fishes. But he evaluates additional five fish's less than five bananas. And because Robinson would like to make short commons more manifold, both now decide to exchange five bananas and five fishes. Thus, the market price of one fish is equal to one banana. As is evident, the phenomenon of market exchange enters into our analysis. This fact strongly affects not only values of macro-aggregates, but also total satisfaction of Robinsons´ and Fridays´ needs. As table 2 shows, production of the economy consists of production for own use and for the market. If we evaluate the production of Friday by the market price (fully in accordance with the SNA methodology), we receive total production of Robinsons´ economy amounting to 20.

There is one important characteristic to which should be paid attention. Robinson has exchanged his products because five fishes are more useful for him than five bananas exchanged. Thus, the use value is higher than transaction value. What is then production? Just sum of "revenues", production or GDP cannot be a rate of satisfactions of human needs or the reflection of welfare improvements[8].

[7] It is worth mentioning that time devoted by Robinson to relaxation is not estimated in the national accounts. But, estimation of time is not impossible, in principle, see Stiglitz, Sen, Fitoussi [2008]

[8] This fact was already mentioned by Kuznets itself: „Market prices are of course a far from perfect

Difference between real satisfaction and production will rise with number of market transactions. Production and exchange increase total utility in the economy, but we cannot say about it nothing more than that this total utility surpasses production.

Table 3: Occurrence of capital goods (t+2, t+3)

Production Account			
Intermediate consum.	0	Production	50
		R: for own use	20
		for exchange	10
		P: for own use	10
		for exchange	10
Value added	50		
Generation of Income Account			
Wages	0	Value added	50
Mixed Income	50		
Use of Disposable Income Account			
Final consumption	40	Disposable Income	50
Savings	10		
Capital Account			
GFCF[9]	0	Savings	10
Changes in stocks	10		
Valuable	0		
Closing Stock			
Stocks	10	Net wealth	10

When basic needs are met, Robinson is starting to think about dwelling. But this demands larger time investment, this need of time is supposed to be four days. Thus, Robinson needs to produce sufficient stock of consumption goods that will be consumed during the time of production of dwelling, i.e. his target stock of consumption goods is 40. So, next day Robinson will intensify his production effort and, as a result, he will create stock in the amount of 5. After two days, Robinson realizes that it is more effective to devote actual stocks of consumption goods (10) to production of capital goods – axe that will make possible to increase productivity and to reach the target stock sooner than by current procedure.

Table 3 records the activity in following two days. Robinson has devoted more time to production of consumption goods and has increased his production to 30; one third of the production is saved. Friday hasn´t change his behaviour, he has produced and consumed every day the amount of 10. But, due to change in the behaviour of Robinson, the stock of consumption goods has increased to 10 (bananas) without absolute restriction of consumption. As was mentioned, saved

measure of how well goods satisfy society´s Leeds." Viz. Kuznets (1941), p. 55.

[9] GFCF = gross fixed capital formation.

consumption goods will be consumed during the process of production of capital goods. Fifth day, Robinson is producing the axe, i.e. capital goods, which will increase his productivity. Look at the situation in the national accounts (t+4).

Table 4: Production of capital goods (t+4)

Production Account			
Intermediate consum.	0	Production	20
		R: for own use	10
		for exchange	0
		P: for own use	5
		for exchange	5
Value added	20		
Generation of Income Account			
Wages	0	Value added	20
Mixed Income	20		
Use of Disposable Income Account			
Final consumption	20	Disposable Income	20
Savings	0		
Capital Account			
GFCF	0	Savings	0
Changes in stocks	0		
Valuable	0		
Closing Stocks			
Stocks	10	Net Wealth	10

Friday hasn´t change his behaviour, one half of his production he has exchanged with Robinson, which has drawn the consumption goods from his stocks. Thus, Robinson´s stocks are lowered by 10, which value was intended for consumption. How should be capital good estimated? According to assumption, we assess capital good on the base of opportunity costs. "Cost value" of capital good is then 10 (bananas). So, instead of production of consumption goods, result of the Robinson´s activity in this period is capital good. In effect, the amount of stocks *didn´t change*, the only change is in the structure of stocks that are now formed not by consumption goods, but capital good. This is very important change in economic situation.

Table 5: Rise in productivity (t+5, t+6)

Production Account			
Intermediate consum.	10	Production	80
		R: for own use	50
		for exchange	10
		P: for own use	10
		for exchange	10
Value added	70		

Generation of Income Account			
Wages	0	Value added	70
Mixed Inxome	70		
Use of Disposable Income Account			
Final consumption	40	Disposable income	70
Savings	30		
Capital Account			
GFCF	0	Savings	30
Changes in stocks	30		
Closing Stocks			
Stocks	40	Net Wealth	40

Consider period t+5 a t+6. Due to capital good, Robinson has increased daily production of consumption goods from 15 to 30. Because of use of the axe is taken as intermediate consumption in the SNA, intermediate consumption is introduced into our analysis. Intermediate consumption is de facto expenditure for production purposes, inputs into production activity. The existence of intermediate consumption and investment activity as such is, at the same time, the reflection of lengthening of production into more phases that are necessary to produce such time-consuming product as a dwelling by use of capital good[10].

Thus, the axe is recorded as intermediate consumption. For clearness, in table 5 we summarise two periods. The amount of production is sufficient for satisfaction of more urgent needs and for formation of additional stocks of consumption goods necessary for time of producing dwelling (four days). By taken one half of the value of axe in each period, we are again fully consistent with the national accounts approach. As Kuznets quotes: *„ …; and one of the first difficulties encountered in estimating national income for an interval as short as a year is to get annual values of the intermediate consumption of such goods.“*[11] We solve this problem by assumption on lifetime of the axe, i.e. two periods.

The production of Robinson economy amounts to 80, whereas ten has been consumed as intermediate consumption. Value added is, in our case, simultaneously the mixed income and disposable income (there is no redistribution, etc.). Robinson produced 60, part of value added (50) has been consumed (20) and the other part he has saved (30). Final consumption of the economy as a whole amounts to 40, the rest is net element – change in the stocks (+30). Net wealth of Robinson economy has risen due to savings to 40 and this is formed by capital goods intended for

[10] Here we touch the issue of "double counting" (see. Samuelson [1995]), that is the issue of capital goods being included in the value of final product. This can be compared to the situation of fixed capital serving more than one period. Naturally, duration of period is fully arbitrary choice of national accountants. The differentiation of capital goods between intermediate consumption and fixed capital is important distinction between Keynesian and Austrian economics. For discussion see Reisman [1999], Skousen [2008], Johnson [2002].

[11] Kuznets [1941], p. 41

production of dwelling (in modern expression – durable).

Table 6: Economic activity in t+7 - t+10

Production Account			
Intermediate consum.	10	Production	90
		R: for own use	50
		for exchange	0
		P: for own use	20
		for exchange	20
Value added	80		
Generation of Income Account			
Wages	0	Value added	80
Mixed Income	80		
Use of Disposable Income Account			
Final consumption	80	Disposable income	80
Savings	0		
Capital Account			
GFCF	40	Savings	0
Changes in stocks	-40		
Closing Stocks			
Fixed capital	40		
Stocks	0	Net Wealth	40

Following four days, Robinson is attending to production of fixed assets (dwelling) and, at the same time, he is consuming stock of consumption goods. Due to lifetime of the axe (capital good), Robinson has to renovate it. So, first day of time devoted to housing formation he has to renovate capital good (the axe) and three days he is producing housing. The result of his effort is fixed capital formation that will serve for many of periods. The important question is, again, how should we estimate this fixed capital?

Relevant is approach recommended by methodology of national accounts[12]. In the national accounts, products produced and intended for own final uses are assessed in basic prices of similar goods traded on the market. In our case, there is not some housing market. But, we do not deviate from the SNA, if we estimate the housing in the amount of costs expended on the production[13]. As production costs we than understand the sum of intermediate consumption, wages, fixed capital consumption a taxes on production[14].

[12] ESA95, ESA2010 (SNA2008, respectively).
[13] Dtto, par. 3.49
[14] Dtto, par. 3.33

In Robinson´s case, of course, we can ignore wages, fixed capital consumption and taxes on production. Only intermediate consumption comes on force. Table 6 describes the situation after four days, during which Robinson produced and consumed capital good (axe), as well as stock of consumption goods, but, at the same time, he produced fixed capital in the form of house. So, the value of production is formed by the amount of direct inputs (axe) and opportunity costs (i.e. non-produced consumption goods), amounting to 50. For completeness we should ad, that Friday´s economic activity didn´t change and during surveyed periods (days) he produced goods in the amount of 40.

3. Business cycle of Robinson´s economy

Assumptions on economic activity described in the second part are not essentially different from real economic activity of households. People often try to get foodstuff or build houses also by self-help. Now, we examine time series recording economic activity in all surveyed periods. As we know, consumption goods as well as capital goods were produced. Thus, we can observe change in time preferences as a necessary condition of capital goods formation. The existence of capital goods caused changes in the production process and productivity.

Chart 1: Production, intermediate consumption and value added

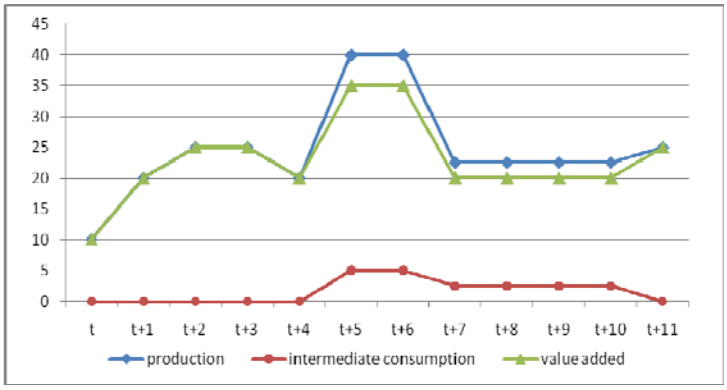


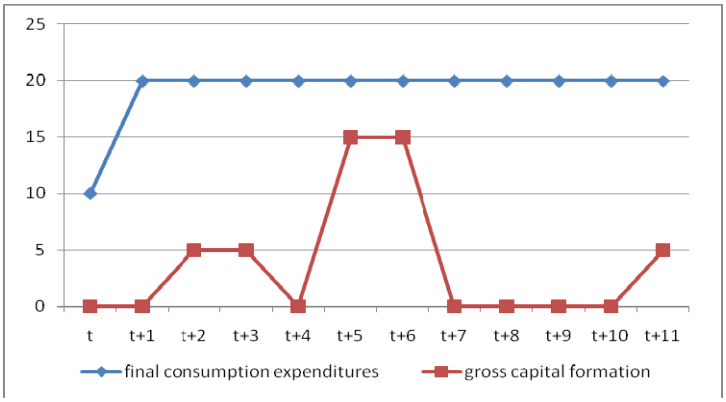
Chart 1 displays main aggregates, i.e. production, intermediate consumption and value added in the Robinson economy. Identical rise in production and value added can be observed in the first five periods. The reason is evident, the absence of capital goods. In the period t+4, Robinson changed his time preferences, i.e. relative price of current goods has decline in comparison to prices of future goods. In other words, Robinson has created savings and, as a consequence, interest rate in our fictitious economy falls. Savings are then used to finance working capital (intermediate consumption). Intermediate consumption requires more attention. First of all, intermediate consumption gives rise to difference between course of production and value added. Value of production is adjusted by intermediate consumption according to assumption that value of input enters into the value of production! Or from other perspective, value of produced goods has to cover value of inputs[15].

[15] Very interesting discussion on this topic can be found in Akhiapor a Reisman [2005]. There is also

Intermediate consumption is reflection of economic process as a time-consuming activity[16]. This can be understood as goods and services intended for utilization in further stages of production[17]. In reality, capital goods formation is not negligible sphere of every capitalistic economy, these amounts usually to 70 percent of total production. Thus, by exclusion of goods and services classified as intermediate consumption (in accordance with value-added concept of the SNA) we lose many information, on all (in very truth all) goods and services produced in the economy in certain period, on range of activities creating certain "value added", we repress the view of production as a process in time[18].

In addition, capital goods are formed for future productive use, they represent the fact that before the good is completed as consumption good, it changes its form many times. Thus capital goods have principal link to future situation of the economy, production, productivity, consumption or welfare[19]. This fact has clear connection to predictive power of GDP. We can raise the question, how can be future course of the economy predicted on the base of indicator that does not takes fully goods and services that determine the future course of the economy? As a result, GDP overestimates the role of consumption; but consumption is very stable in time, so aim at avoiding double counting impedes correct business cycle analysis.

Chart 2: Expenditures on GDP by type



Production and consumption of capital goods is purely question of production sphere of the economy. Importance of omission of majority of capital goods is indicated by standard deviation that is significantly higher in simplified Robinson economy in the case of production (7,9) than for value added (6,6)[20]. Because most stable course is recorded in case of consumption, thus value added concept has stabilizing effect on the indicator of total economic activity.

Chart 2 give us picture of Robinson economy from the "demand" side, i.e. GDP as

important issue of ineffective activities creating non-positive value added, these can show decline in economic activity.

[16] Skousen [2007]

[17] Intermediate consumption reflexes process of production in time, consumption of inputs and entrepreneurs´ expectation, as well as rising specialization and lengthening of production processes.

[18] Skousen [2007]

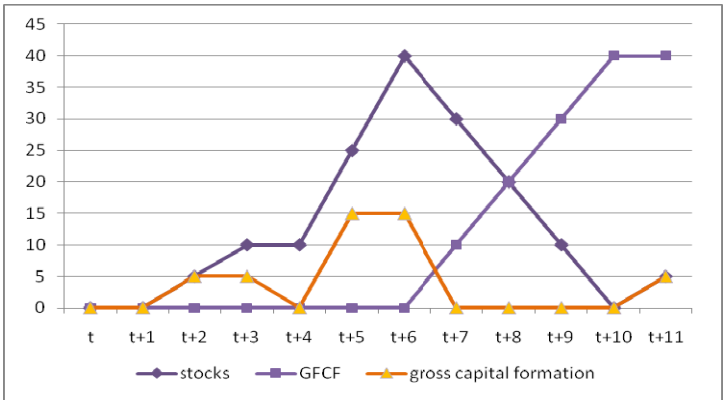
[19] Popper [2000]

[20] That most stable aggregate is the aggregate of consumption expenditures, see Rybáček [2009].

a sum of expenditures on value added. Since we can ignore export and import, the only expenditures on GDP are consumption and investment (gross capital formation); these expenditures signify different volatility. Significant rise in consumption expenditure between t and t+1 is caused by the rise in number of households. In subsequent periods, the level of consumption is stabilized and standard deviation of this aggregate is markedly low (2,8). Much stronger volatility can be identified for investment (5,5) formed by fixed capital (4,7) and changes in the stocks (8,8).

Now it is evident, that it is not necessary to restrict consumption to create savings (see production in chart 1 and consumption in chart 2), but this restriction can be only relative[21]. In other words, consumption does not reach its potential maximum level determined by production[22]. Accumulation of stocks in t+2 and t+3 is the result of decline in time preferences. In period t+4, Robinson produced capital goods. This important moment in his effort is not displayed by GDP, due to proportional decrease in stocks of consumption goods. There is no new good produced during this period from the GDP perspective, stocks of consumption goods were only "transformed" into stock of capital good[23]. This net element (stocks) in "demand" GDP is counterparty of value added concept in GDP by "production approach"[24]. Between t+6 and t+7 significant fall in GDP by more than 40 % is recorded that is caused by "falling" investment activity (due to stock utilization), even if there was no decline in economic activity at all.

Chart 3: Investment activity



So, due to gradual increasing value of produced fixed asset and counter decrease in consumed stocks, there is no economic activity observed in the GDP that would result from this endeavour of Robinson. In modern terminology we could say, that the economy

[21] Ropke [2000]

[22] All produced things are not consumed at the same time. In other words, it is no possible to consume good or service that has not been produced. Thus, an amount of consumption is fully dependent upon volume of production. This fact contradicts to the mainstream view of production being dependent upon consumption. This mainstream view is valid on micro-level, but on macro-level this must be to the contrary. See Reisman [1991]

[23] Production of capital good is important moment. This enables to Robinson to increase production and reach goods and services with longer production process. Thus, the existence of capital goods connects the presence and future (Popper [2000]).

[24] For discussion of net element of stocks see Reisman [1999], Johnsson [2002]

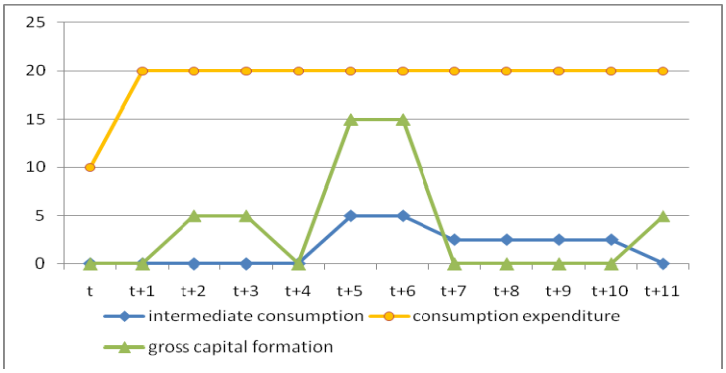
was pulled up by consumption. But, against the backdrop of this consumption driven economy, there are huge changes taking place in the economy, i.e. production of asset that will significantly influence the living standard. This is the consequence of restricted sight of economy from the GDP position that does not take into account (among others) stocks of assets or liabilities. Thus, GDP in these periods can be expressed in following way:

GDP = C + I = C + [GFCF + change in stocks] = 10 + (10-10) = 10

It is not absolutely clear on theoretical level, if dwelling has consumption or investment nature. But, this is not important for our analysis. In the case of dwelling as consumption good, we can rewrite GDP to following form:

GDP = C + I = 20 + (-10) = 10

Chart 4: Goods and services account



Now we turn our attention to uses side of "goods and services account" that is sum of use in form of intermediate consumption, final consumption or investments (export is ignored). In chart 4, we can see smoothed course of consumption during all periods. Use for production purposes (investment and intermediate consumption) indicates much stronger volatility of production sphere. This in accord with the fact, that business cycle was historically caused by production and not consumption activity[25]. This is result of changing time preferences and variable amount of savings. The illusion of stability providing by GDP can be avoided by abandonment of value added concept by business cycle analysis.

Unfortunately, the new methodology of the SNA doesn´t bring any change in this respect, it rests on the assumptions put by Keynesian economics, in which the indicator GDP originally served as indicator of the taxable capacity of (British) economy. So, it necessary to calculate separate indicators, this debate can be found in Reisman [1999] or Skousen [2006], empirical application of alternative indicator of business cycle in Johnsson [2001] and Rybacek [2009].

[25] Rothbard [2002]

4. Wealth effect and macro-aggregates[26]

Finally, we mention specific case that is very topical. Suppose that Robinson discovers some place full of precious stone called topaz. He picks some for embellishment of his new dwelling. There was no value except his psychic return. But, Robinson comes upon village in which tribesman use topaz as money. In this moment, value of Robinson´s stock of topaz has risen and Robinson can purchase any products produced by inhabitant of this village, if this product will be more valuable for him than stocks of topaz held by him.

Thus, Robinson´s wealth has risen due to exogenous rise in the value of non-financial asset in Robinson´s "portfolio". This rise is not a result of productive activity; it is just question of changes in prices. From other perspective, Robinson can purchase consumption or capital goods made in village and to increase GDP, but this rise in expenditures is not caused by rising income generated by expanding productive activity. So, *the income didn´t change, but consumption has risen*. This takes us to the conclusion that GDP doesn´t take into account the way of financing of expenditures. Last but not least, what is the rate of savings of Robinson?

Suppose that Robinson thank to his productive activity generates (disposable) income amounting to 10 (and this income is fully consumed). But except this Robinson reached holding gains above mentioned amounting to 5. Robinson uses this unexpected gain to purchase (consumption) goods from tribesman in the amount of 4. To compare disposable income and consumption expenditure (as is the practise of the SNA) we obtain the amount of savings -4 and savings rate -28,6 %[27]. In reality, Robinson´s resources are 15. Thus, real savings are +1 and savings rate 6,7 %. SNA savings rate and "adjusted" savings rate give us completely different picture on human behaviour.

Because the holdings gains are not reflected in disposable income, it doesn´t make sense to compare income generated by productive activities and final consumption expenditure that can be realised not only out of current income. As logical consequence, we cannot conclude that savings is non-consumed part of disposable income! The reason is, again, that there are more sources of consumption financing than only disposable income. Thus, it seems to be misguided to assess savings behaviour and business cycle position of economy on the base of the national accounts concepts of disposable income and savings. The crucial problem is in both, restricted production boundary and restricted disposable income definition[28].

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[26] Concept of this chapter is based on the paper presented on the conference „Group of Experts on National Accounts" in Geneva [2010]

[27] Thus, it is not possible to conclude that negative saving rate (in the SNA) tell us something on real savings creation. We can make two notices. First, in the case of positive holding gains reached by asset holders, these can have no incentive to make savings out of disposable income. And second, these holding gains can be used to consumption rise, if owner sold his assets for higher price, or rise in price can serve to increase of debt as in the case of houses. Rybáček [2009]

[28] Gains reached by price changes are not included in disposable income, as was already mentioned.

This state of affairs is the result of theoretical discussion preceding the development of the national accounts. As was mentioned, the SNA is based on Keynesian concept. Keynes [1936] called discussed gains (or losses) as a „windfall"[29]. Keynes admits that consumption doesn´t depend only on net disposable income, but he argues: *„..., although the windfall loss (or gain) enters into decision, it does not enter on the same scale."*[30] This flows shouldn´t be included in the disposable income, according to Keynes. This approach is still preferred, even if this has serious impact on predictive power of macro-aggregates. "Non-income" transactions (as a holding gains or losses) serving to consumption financing change the Keynesian view of relationship between disposable income and consumption expenditures, as described by Keynes: *„ ... the amount of aggregate consumption mainly depends on the amount of aggregate income."*[31]

Concluding remarks

Correct analysis of business cycle must take into account time preferences, creation of voluntary savings and investment activities as driving factors of business cycle and economic growths, i.e. crucial is the role of capital. The SNA is based on theoretical reasoning of Keynesian economics that suppresses the importance of capital and this is fully introduced in the SNA. As was shown, concepts of the SNA aggregate are not compatible with proper business cycle analysis. Main problems are restricted definition of economic activity; value added concept; restricted definition of investments and resulting orientation on consumption.

For proper identification of the business cycle position, it is thus necessary to develop alternative indicators of economic activity fluctuation that will far less serve to fiscal needs of fiscal authorities (as the SNA and GDP do) and much more to correct business cycle analysis; these are discussed in Skousen [2008], De Soto [2006] or Reisman [1998]. Revision of approach to business cycle analysis is one of the most challenges of current economic crises. Without correct information on business cycle position, there are erroneous reaction of individuals and institutions as we have witnessed in last decades.

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This is the result of Keynesian concept and recommendation of International Expert Group on Households Statistics [2001], see also Kuznets [1961]. Opposite opinion can be found in Eisner [1988].

[29] Keynes [1936], chapter 6.

[30] Dtto.

[31] Dtto.

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