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Ulrich Blum

What Can Ukraine Learn from *Aufbau Ost*?

This article uses *Aufbau Ost* (or reconstruction of the East) of the new German states as a structural model to estimate the possible costs of an *Aufbau Ost 2.0* of Ukraine while taking institutional differences into account. Based on three approaches, the model is validated for the new German states – namely capital coefficients, actual investment flows and actual public transfers – and applied to Ukraine. Key indicators for Germany from 2021 are used as a basis. The economic goal for Ukraine set in this article is to reach Poland's present level of prosperity in 15 years, which implies a growth rate of 9% per year. This will require a total of US \$8.5 trillion over 15 years, which can, however, be financed to a considerable extent by endogenous, investment-driven economic growth if the institutional framework conditions are designed in a market-economy way, especially the taxation system. Transfers and capital imports must close a current account deficit of about US \$200 billion per year.

Rising from the ruins

Ongoing destruction and reconstruction

February 24, 2023 marked the one-year anniversary of Russia's invasion of Ukraine – from a naïve Western point of view. In fact, the war began much earlier: ideologically, at the latest with President Putin's 2007 speech at the Munich Security Conference, which was a declaration of conflict; politically, through constant Russian meddling into Ukrainian affairs from the time of the Orange Revolution in 2004-05 to the Euromaidan protests in 2013-14; and militarily, with the annexation of Crimea and the invasion of the Donbas by irregular forces in 2014.¹

Since the beginning of the so-called special military operation against Ukraine, according to the proclamations of the Kiev government, assets of around US \$100 billion have been destroyed in every month of war – an estimated €1.2

trillion since February 2022.² Essential state functions have been endangered and must therefore receive external support not only militarily, but also financially. Europe's acceptance of refugees is an important second field of support.

What does reconstruction cost? The presently available data, which are more or less unsubstantiated, differ considerably. In September 2022, for example, the World Bank, the European Commission and the Ukrainian government quoted amounts between US \$375 billion and US \$750 billion (Deutsche Welle, 2022; Reuters, 2022). What they have in common is a dramatic underestimation of the costs. Much of this is reminiscent of the Tohoku earthquake (Fukushima nuclear accident): the actual expenditure was ten times that of the first estimate. In 1989/90, the year of the fall of communism, the reconstruction of the East was still seen as a kind of walk into a flourishing landscape. The privatisation of the East German³ economy, originally regarded as profitable, left a deficit of around €100 billion (Blum et al., 2009, 76); this example acts as a warning when estimating the assets of a ruined economy because the systemic connections are often underexposed. This is due to the fact that the newly emerging integration in the world economy in a reconstruction programme is apparently causing functional old structures to collapse – for technological reasons, but also because of

1 The economic background of Russia's aggressiveness against the West since the beginning of the 2010s is reported in Blum (2023).

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2 For the first month of war, the Kiev government reported a value of US \$100 billion (Menzel, 2022). In July, the value increased to US \$750 billion (Bayerischer Rundfunk, 2022). In December, it was US \$1,000 billion (Verenkotte, 2022).

3 West Germany and East Germany are used for the period before reunification, and Western Germany and Eastern Germany (or new *Länder*) are used hereafter. All prices are in 2015 US dollars unless otherwise stated.

productivity-induced wage growth, which is making more and more capital goods – previously spared from the effects of war economically – obsolete.

The economic history is therefore as important analytically as it is politically. A distinction must be made between things that can be generalised, and therefore structurally extrapolated, and facts that can be recognised as special influences. With these limitations, *Aufbau Ost* is a suitable reference and is therefore used, with the necessary corrections, as a yardstick for estimating the costs.

Aufbau Ost: An economic characterisation

There were a number of important economic policy aspects of the reconstruction of the East, from which the central problems of the analysis arise.

Productivity catching-up

The productivity of the East German economy was only at about 20%-25% of that of the West. However, the internal purchasing power was around 50%-60%, and even higher for local goods and especially for rents, but this excluded quality aspects.⁴ Although East Germany presented itself at the time as a country with a level of prosperity equal to 80% of that of West Germany and as the eighth-largest economy in the world, this illusion was shattered by the harsh economic realities ushered in by the introduction of the Deutsche Mark. The government of East Germany was aware of this: the directional coefficient (*Richtungskoeffizient*) – a measure of how many East German Marks were required to earn one West German Mark internationally – initially started in the late 1960s with a value of two. It rose over time and was finally set at values above four (Schalck-Golodkowski and König, 1988). In the so-called Schürer Report, the de facto failure of its own economic model was publicly accepted (Schürer et al., 1989).

It is therefore necessary to determine whether wealth ratios based on international competitiveness alone should be taken as the starting point for a catching-up process or whether purchasing power aspects should be taken into account.

Calculating the wealth gap

A considerable part of the capital stock had to be replaced from outside, since the savings rate was too low

4 Many products from East and West Germany, for instance cars, were rather similar in the 1950s because they had an identical technological history, but then started to differ in quality because East Germany lacked the technological potential. As a result, the capital intensity fell (Blum and Dudley, 1999, 2000) and comparisons of development have to adjust for quality methodologically adapted from cost-of-living indices (Boskin et al., 1998).

for the size of the task. This was accompanied by the problem of a limited absorptive capacity. The macroeconomic effect of this was an appreciation – through inflation in East Germany and through the revaluation of the national currency. In addition to state consumer spending and public investment, private investors were in particular demand and were offered investment incentives from state, federal and European funds. This implied a massive transfer of ownership to foreign investors. Only through permanent current account surpluses could the resident population buy back its own assets.

It has to be decided to what extent a reference capital ratio as an indicator of the economy's capital endowment is crucial for calculating the national wealth gap and how the necessary investments are to be valued. This is because capital goods have international prices, but assembly, construction costs and real estate prices are determined locally.

Labour market stabilisation

The openness of markets and inclusion in global value chains not only meant that companies were exposed to global competitive pressure. They also allowed skilled workers to migrate to better-paid functions and regions, with four consequences:

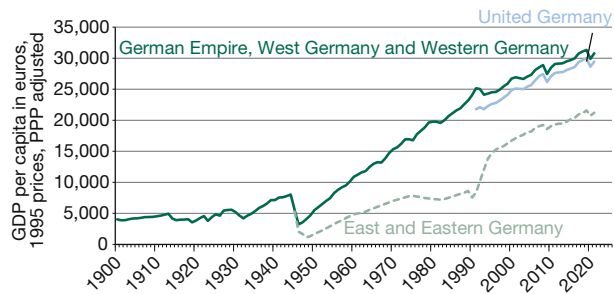
First, wage pressure means that manufacturers outside the international competitive arena feel the productivity whip and have to invest or exit the market. Consequently, this also makes capital obsolete that could still have been used at local prices and wages. This means in the long run that the capital stock becomes more and more similar to the international benchmarks.⁵

Second, workers who moved from the new *Länder* to the West provided a tax contribution to public budgets through their additional economic output, which reduced the cost of the transfer. They often kept their residence in the new German states and thus contributed to the renewal of the residential infrastructure.⁶

5 This aspect should not be underestimated for industrial plant investment, because companies follow best practice in anticipation of future productivity and thus wage increases, and not "efficient" allocation schemes in the sense of the microeconomic calculus. The Opel plant in Gliwice (Poland), which is a copy of the Eisenach plant in Thuringia, is a well-known example.

6 In fact, the impact of the 2.8 million East Germans who moved to West Germany (from the end of 1989 to 2008, around 4.6 million from East to West and 1.8 million from West to East), most of whom were young, qualified and female, contributed to growth in the West and increased tax and social security contributions. Together with the multiplier effects of the reconstruction of the East, this meant that the tax revenues induced exceeded the net transfers in 2006. The reconstruction of the East had at least fiscally ended (Blum, 2015).

Figure 1
Long-term growth paths in Germany, 1900-2021



Source: Blum (2019), updated.

Third, the demographic structure comes under pressure from the migration of workers and their families, which in turn reduces long-term growth prospects.

Fourth, the local effect on investment costs decreases over time.

It needs to be determined what initial boost to wage adjustment should be financed by transfers. A stabilisation of labour markets is achieved in terms of low interregional migration, when income differences remain within a range of plus or minus 20%. The level of social assistance is likely to be a benchmark for the lower limit.

National reunification

The integration of the territory of East Germany into the European Union and NATO provided institutional security, especially reliability in the legal system (rule of law) and for investments.

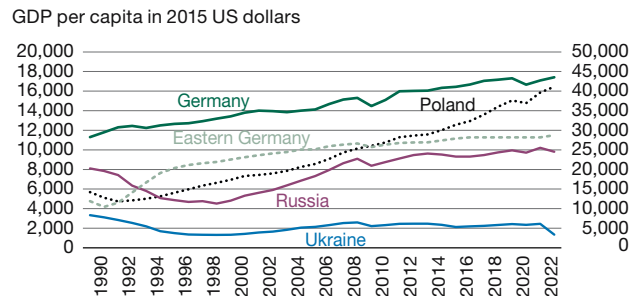
Looking at the situation in Ukraine, the main difference is that there is no national reunification, which reduces the possibilities (and the political will) for transfers, but presumably accelerates the pressure to migrate – and thus the pressure on wages and the devaluation of the capital stock. This is where the prudent policies of the European Union and international organisations come into play.

Stability of growth paths

How plausible is it that Ukraine will catch up? Many studies show that economic catastrophes can quickly be overcome with the re-establishment of stable institutions. The example of Germany is shown in Figure 1.

Both after the First World War and after the Great Depression from the end of the 1920s onwards, the economy quickly made up for the lost years of growth. Since the

Figure 2
Development of the economic performance of Germany, Poland, Russia and Ukraine



Notes: Left-hand scale: Poland, Ukraine, Russia; right-hand scale: Germany, Eastern Germany.

Source: Author's compilation with data from World Bank (2023).

figure is based on per capita income, one can clearly see that this also applies to the Federal Republic of Germany, which already in 1954 surpassed the economic performance of 1939 and, on the basis of constant growth rates, i.e. on an exponential path from 1900, returned to this path as early as 1960, which then weakened. If one takes the year 1946 as the starting point, West Germany (Western Germany) is largely growing on a linear path. This also applies to East Germany, which experienced a slump in the 1980s. In addition to the country's changed global energy situation, a general decline in economic efficiency was caused by the expropriation and the forced centralisation of private medium-sized enterprises (Blum 2013, 2019), which lead to an erosion of their, until then, above-average efficiency in relation to state-owned industries. This slump was overcome by the upswing after reunification that brought Eastern Germany back to the old growth path. However, it was not possible to catch up with the West German economic level.

The Ukrainian economy under existential threat

To assess the economic development of Ukraine, it is appropriate to use the development of Poland and Russia as a benchmark. Figure 2 does this, and the per capita income values are plotted on the left-hand scale. The figure shows that Poland had a worse starting point than Russia, but due to the resolute reform policy of the government at the time, a steady upswing soon took place, with a convincing average annual growth rate of 4% over 31 years. Russia's growth rate, on the other hand, initially plummeted as a result of the drop in oil prices and the subsequent sovereign debt crisis, and the country did not exceed its initial level of prosperity until 2007. If the low point of development in 1998 is taken as the starting point, then the growth rate over the remaining 23 years was still around 4%. Although the Ukrainian Socialist Re-

public was one of the most industrialised regions in the Soviet Union, Ukraine's economy was already at only 41% of Russia's economic output level in 1998. It experienced the same economic crash as Russia, but was unable to recover. From 1989 to 2021, it shrank by 26%. The devastation of war destroyed another 45% of economic output in 2022, which means a total loss of prosperity of 59%.

In addition to the comparison with the Polish development, Germany's reconstruction effort in the East is also taken into account. Therefore, the growth development of unified Germany and additionally of Eastern Germany, i.e. the new *Länder*, are plotted on the right-hand scale of Figure 2, where the initial catch-up process is again visible; this process came to an end, however, in 1997.

All of the transition countries experienced a sharp adjustment recession after the Wall came down, the shortest of which could be seen in the new *Länder* due to massive aid from Western Germany. Poland's adjustment occurred somewhat later but with the most sustained subsequent development, which was strongly supported by the European Union. Russia's adjustment came later due to the rise in fossil energy prices. Ukraine, however, remained at the low level it fell to in the first five years. The main reason for this was the internal (political and economic) rift between its eastern and western provinces, which drove up risk costs for foreign investments and made the country a crisis location from 2014 at the latest. In addition, the strong industrial relations with Russia from the Soviet era collapsed, sectorally in parts of the steel, defence and aerospace industries, and regionally in the Donbas.

Approach und assumptions of the analysis

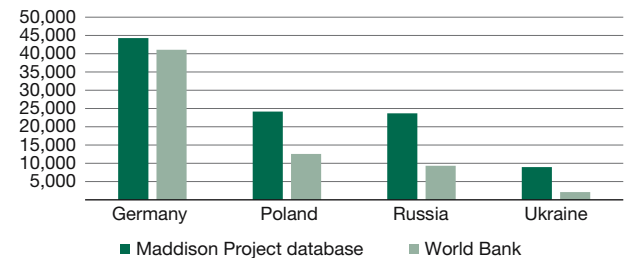
Analytical access

A first approach to calculating the costs of reconstructing Ukraine is to determine sectoral capital coefficients and apply them to Ukraine. These have a high degree of referencing capacity because virtually all capital goods have an international price – and if Ukraine wants to write a growth and prosperity story, it must open itself up to international competition, unlike in the years after the fall of the Soviet Union. These must be corrected for purchasing power aspects, since investments, once they are location bound, depend on the local factors of labour and real estate. However, with the increasing internationalisation of the economy, this local effect melts away.

Under the conditions of an open economy, the applicability of the case of *Aufbau Ost* to Ukraine can be checked by using the actual financial flows as a control variable to see whether what was privately invested or publicly trans-

Figure 3
Purchasing power relations of the economies of Germany, Poland, Russia and Ukraine

GDP per capita in US dollars, 2015



Sources: Author's compilation from data by World Bank (2023) and Bolt and van Zanden (2020).

ferred also corresponds to what was realised in terms of capital stock accumulation.

Further assumptions

It is assumed that Ukraine will guarantee investment security in terms of regulatory and security policy and that Europe and international organisations will therefore launch a massive public support and development programme that will attract private investment in particular. In the process, the import share of new investments will be large enough to prevent transfer problems, i.e. no counterproductive revaluation effects will result. This in turn requires that new investments in Ukraine correspond to best practice or state of the art. For the capital coefficients, in turn, this means that the investment requirements derived from this initially have a 50% share of local prices (or less in the case of high technology), which then diminishes over the 15 years with increasing economic development.

Finally, the adjustment processes, i.e. the necessary closing of the income gap, are also aligned with purchasing power parities (PPP). Figure 3 illustrates this for the four countries discussed above. For 2015, the per capita income for Germany reported by the World Bank statistics is 93% of the value of the purchasing power-adjusted per capita income reported by the Maddison Historical Statistics Project (Bolt and van Zanden, 2020). For Poland, this value is 52%, for Russia 39% and for Ukraine 24%. Based on data from the Maddison Project (in parentheses World Bank data), Poland's wealth is 55% (31%), Russia's wealth is 53% (23%) and Ukraine's wealth is 20% (5%) of that of Germany.

Data shows that with increasing prosperity, the mark-up of PPP-adjusted indices versus foreign exchange indices falls. Studies show (Demary and Zdrzalek, 2022) that the share of tradable goods ranges between 40% to 50% of the goods sold in an industrialised economy. Average wealth ratios

Table 1
Estimation of the necessary stock of capital for Eastern Germany and for Ukraine, basis 2021

Category	Western Germany			Eastern Germany		Ukraine		
	Germany assets (US\$ bn)	Reference	Value of reference (million pers.)	Capital coefficient (US\$/pers.)	Value of reference (million pers.)	Calculated total assets (US\$ million)	Value of reference (million pers.)	Calculated total assets (US\$ million)
Residential	8,446	Population	83.2	101,516	12.5	1,268,955.0	43.8	4,446,418
Non-residential								
Non-residential buildings	4,081	Employment	45.3	90,091	6.8	612,619.4	22.8	2,054,077
Civil engineering (other buildings)	1,961	Employment	45.3	43,289	6.8	294,365.7	22.8	986,991
Equipment	2,355	Employment	45.3	51,996	6.8	353,571.3	22.8	1,185,504
Farm animals and crops	10	Employment in agr.	0.6	17,350	0.1	1,735.0	3.2	55,777
Intellectual property	990	Employment	45.3	21,851	6.8	148,586.9	22.8	498,203
Total	16,854					2,679,833		9,226,971

Source: Author's computations.

were calculated under the conditions of rising price effects of international energy costs with 5% adjusted for purchasing power and 50% along real dollar ratios. Accordingly, in 2021, Poland will have 43% of Germany's level of prosperity, Ukraine 13%, and the latter in turn 27% of Poland's prosperity. It follows that Ukraine will have to increase its prosperity by a factor of 3.7 to catch up with the current Polish level, which implies an average growth rate of 9% over 15 years.

Estimating the costs of the reconstruction of Ukraine

The new federal *Länder*: A check of the model⁷

As mentioned above, data are available for *Aufbau Ost* that allow the quality of the approach chosen here to be verified (Blum et al., 2009).

The public financial flows dedicated to the reconstruction of the East were analysed by Blum et al. (2009) with the aim of capturing the incidence of public expenditures and determining the actual burden on public budgets as they induce taxes that reduce the financial burden. Based on this, it could further be found that the employment of a large number of East Germans who migrated to the West triggered considerable growth effects for Germany as a whole (Blum and Scharfe, 2002). If one adds the multiplier effects of the additional demand induced by reconstruction to the extra taxes and social security contributions collected, it generates a public financial revenue that exceeded the net ex-

penditure for reconstruction in the East from the mid-2000s onwards (Blum, 2015). This is the basis for the timeframe of 15 years chosen here for the reconstruction of Ukraine.

The analysis of the current account balances of the East German federal states makes it possible to determine which capital investments have flowed into the new *Länder* and to estimate the amount of capital stock that has to be built from scratch.

Using German capital coefficients, it was possible to check what the total capital stock of the new states needed to be in order to catch up with the level of the economy and public infrastructures of Western Germany.

Since German reunification implied a constitutional claim of former East German citizens to the West German social product and free mobility prevailed, the individual income level had to be raised to the level of West German social assistance, i.e. about 60% of West German wages, in order to prevent massive emigration and thus exploding costs in the West. Since the productivity of the East German economy was at most 25% of that of West Germany, unification was tantamount to an economic drastic cure. Typical central government tasks such as the social systems or the overarching construction of transport routes were extended to the East. As a result, public financial flows at dollar prices for the period from 1991 to 2005 added up to about US \$3 trillion. Because of induced taxes and social security contributions, the actual burden on public budgets was only half. Most of the transfers covered ends related to political, legal and social institutions. Thus, the actual share of investments or investment aid in the total sum only reached about 15%, i.e. about US \$438

⁷ All figures are in US dollars at the 2015 price level, i.e. not at the price levels of the period of reconstruction in the East. This approach was chosen to facilitate easy transferability to today's reconstruction of Ukraine.

billion.⁸ If 60% of the West German wage level were to be reached, this would require an amount of €2.6 trillion over 15 years.⁹ If one adds the US \$438 billion from public investments, one is almost on a par with the payment flows based on budget statistics.

The calculation based on the capital stock is shown in Table 1. The capital stock is related to the German reference values and then multiplied by the respective reference values of Eastern Germany and – as a first approximation – Ukraine. The value for Eastern Germany is US \$2.7 trillion, which is very close to the previous calculations. The value for Ukraine assumes German wealth levels. The amount of US \$9.2 trillion will therefore have to be corrected.

The calculation shows that three methods, for which statistical uncertainties have to be accepted, can be used to produce very similar and realistic results for the first 15 years of development. This suggests that this structure can be transferred to the Ukrainian case.

The cost of rebuilding Ukraine

In the following, the transfers and investment requirements for the development of Ukraine are calculated. A per capita income of US \$6,397 is set as the starting point for Ukraine for the year 2021. This value is between the official World Bank value of only US \$2,452 and the PPP-adjusted value, which is four times higher. As a target value, the Polish per capita income of 2021 is calculated analogously at US \$23,180. It is 3.6 times higher, and to reach it in 15 years, the Ukrainian economy would have to grow by 9% per year. If Poland could maintain its current growth path of 4%, it would have increased its economic output by 80% in this period. However, the per capita income ratio of Ukraine relative to Poland would have increased from 28% to 55%. The state revenues must be offset; the tax ratio was initially set at 50%, but then falls by five percentage points over time.

Table 2 summarises the results of the analysis. The left-hand column shows Ukraine's initial situation based on the values for 2021, while the right-hand column shows the values for a period 15 years after the start of reconstruction. With 43.8 million inhabitants, the gross domestic product amounts to US \$280 billion, and then grows to over US \$1 trillion. The allocation of private and government consumption follows the average values of developed economies. The tax rates assumed are in line with the requirements to finance development and be incentive compatible.

⁸ The exact analysis for the new German states can be found in Blum et al. (2009).

⁹ Sixteen million inhabitants x €18,000 wage x 60% x 15 years.

Table 2
Reconstruction of Ukraine: Total expenditures

Industry / economic aggregate	Annual values in US\$ million	
	Starting period (Ukraine 2021)	Starting period +15 years at 9% annual growth
GDP (50% PPP)	280,168.1	1,015,299.3
Private consumption (55%)	154,092.5	558,414.6
Public consumption (20%)	56,033.6	203,059.9
(Gross) investments, public and private (25%)	70,042.0	253,824.8
Taxes and social security contributions (50% -> 45%)	140,084.1	456,884.7
Public budget stabilisation and reconstruction		
Central government and provinces	34,203.1	114,648.6
Social security	30,914.4	103,624.7
Privatisation – deoligarchisation	1,924.2	6,449.8
Total public budgets	67,041.6	224,723.2
Income from taxes and social security contributions (50% -> 45%)	33,520.8	101,125.4
Balance of public stabilisation and reconstruction	-33,520.8	-123,597.7
Reconstruction of capital stock		
Public investments and investment incentives	10,095.8	33,840.9
Residential	148,213.9	237,142.3
Non-residential	68,469.2	109,550.8
Civil engineering (other construction)	32,899.7	52,639.5
Equipment	55,323.5	71,130.2
Farm animals and crops	1,859.2	2,974.8
Intellectual property	26,570.8	31,552.9
Total investment	343,432.2	538,831.4
Total investment without public sector	333,336.5	504,990.5
Income from taxes and social security contributions on investments	13,273.8	20,097.8
Total expenditures of public and private sector	400,378.1	729,713.7
Public balance stabilisation and reconstruction	-30,342.7	-137,340.9
Current accounts deficit of reconstruction of capital stock	151,229.8	203,065.2

Sources: Author's calculations with data from the Federal Statistical Office of Germany (2019); Blum and Scharfe (2002); Blum et al. (2009), Blum (2012).

The second block contains the state expenditures of reconstruction including investment aid, guaranteeing the institutions of the state and social security. All state-securing expenditures are included here, and make clear that the amounts cannot be covered initially by the

Ukrainian government. State and provincial expenditures grow from US \$34.2 billion to US \$114.6 billion and social security from US \$30.9 billion to US \$103.6 billion. This exceeds the amounts mentioned in the first block by US \$9 billion and US \$15 billion, respectively. For privatisation and – crucial for Ukraine – deoligarchising (the task of the Treuhand in Germany), the annual expenditure is between US \$2 billion and almost US \$6.5 billion. Induced tax and social security contribution revenues are listed two lines below and offset part of this sum. This considerably reduces the actual burden on the national budget, which has to be covered by other revenues, to US \$33.5 billion, rising to US \$123.6 billion.

In the third block, capital coefficients are used to calculate the expenditures for rebuilding the Ukrainian capital stock. The value of around US \$9.2 trillion mentioned above assuming a direct transfer of German economic structures is then reduced to US \$8.5 trillion. The annual values range between US \$343.5 billion and US \$538.8 billion. The first value reflects the initially low Ukrainian wages, which also reduces the cost of implementing investment projects, i.e. wages for supply chain management, assembly, construction, etc.; the second reflects the value more adjusted to international competition and integration of the Ukrainian economy.

This means that initially about US \$400 billion have to be spent annually on reconstruction, and as growth increases and as a result of the associated wage and cost increases, this later rises to US \$730 billion. The value, however, is reduced by taxes and social security contributions in the respective construction phases; classical values for tax ratios, based on input-output analyses, are around 4%, for social security contributions these values range between 2% and 3%, depending on the development of the welfare state. This appears low overall, but is due to the fact that high shares of intermediate inputs are assumed to be imported or are already included in the normal tax and contribution calculation in the upper block because they are produced domestically.

Since investments, with the exception of economic development, are largely privately financed, the government burden of reconstruction activity (as the sum of the two budget balances – own public investments and investment incentives) is between US \$30.3 billion and US \$137.3 billion. The increase in this construction-related deficit is mainly driven by wage developments.

From the government's point of view, the overall costs are limited. This is because a functioning, reconstruction-driven economy generates taxes that help to shoulder this deficit. This necessitates a high responsibility

for Ukraine to ensure the correct collection of public revenues through an efficient tax and social security contribution system.

The reconstruction-related current account deficit results from imports for investment purposes; it initially amounts to about one-third of demand, assuming that other effects balance out (in particular that household imports are covered by business exports), but then falls to one-fifth. These are values that have also been experienced by other transition countries with favourable investment opportunities.

Examining the development of Ukraine as a business case, the only expenditures of interest are of the second and third blocks, the state revenues induced by them and the regular state revenues of the country. Over the course of 15 years, the said €8.5 trillion in total expenditure is offset by income from taxes and social security contributions of US \$5.9 trillion. The difference of US \$2.6 trillion is close to the current account deficit, which ultimately expresses the need for external financing, i.e. capital imports from investors and transfers from other countries, potentially remittances from Ukrainian workers abroad.

Perspectives

Is such a reconstruction of Ukraine feasible? The answer is: yes, but with conditions.

Similar to the new *Länder*, which initially had a current account deficit of about half of their own economic output as a result of transfer-supported, overshooting demand and need for outside capital, Ukraine's "external survival" will largely depend on stabilising the external economic situation through transfers and capital imports. In the scenario, after 15 years and with an economic output equal to that of Poland in 2021, this would be around US \$203 billion.

The initial price situation is similar to that of the new German states. Imports must prevent prices from exploding due to the excessive demand from transfers and capital imports that meets too little supply and triggers massive inflation. Both excessive foreign demand for investment capital and transfers and excessive internal demand for goods either increase the exchange rate or lead to inflation. From an outside perspective, this is a currency appreciation. This effect cost about 10% of industrial jobs in the new *Länder* in addition to the productivity shock (Greiner et al., 1994) and made it too expensive for Germany to enter the euro, which is why an internal devalu-

ation actually took place via the labour market reforms. Wise macroeconomic policy is important here.

The state can finance the construction or accompany private investment with public money if it can rely on an efficient tax system. After all, deficits are manageable if foreign countries have institutional and especially credit confidence. Nevertheless, the national budget will only come into balance in the course of the reconstruction period.

Demography is a challenge because of extremely low birth rates, losses because of the war, and outmigration. In the latter, we find similarities to the Eastern German case. The number of refugees in Europe will certainly exceed 10 million soon because large parts of Ukraine are uninhabitable; in the event of peace, some will return, many will stay in the EU for the time being. A strong propensity to work can be assumed. This could result in a considerable number of remittances. An amount of €5,000 per year would already mobilise a contribution of €25 billion by five million workers. However, the employment of Ukrainian citizens abroad competes with the construction needs at home, which in turn quickly creates wage pressure that can only be avoided by strongly increasing productivity and growth.

Political stability and economic openness are key, otherwise the construction process cannot be accomplished because insecurity and local pricing power stifle the willingness to invest. Finally, the location must remain attractive so that returns do not flow away but are reinvested locally.

The potential for a self-sustaining upswing is enormous, because “best practice” is built into industrial premises and this above all is what the public eligibility criteria for financial incentives must require. In addition to agriculture and its potential for a food industry, the country also possesses important strategic raw materials for the energy transition, which favour new local value chains. Particularly worthy of mention are rare earths and battery raw materials, as well as titanium and palladium (Blum et al., 2023).

Ukraine must escape the conflict zone in which it is currently stuck and gain an independent political perspective for the future. Then reconstruction will be feasible, manageable and profitable. Otherwise, it will become a poorhouse of Europe. Through its war of aggression and the complete loss of its reputation under international law, the Kremlin has made a cooperative solution impossible in the short term. Thus, the West is called upon to find a viable solution for Ukraine that will also open up future political access for Russia in the distant future.

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