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The Ukrainian Iron and
Steel Industry in Transition

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Rusting Away?

The Ukrainian Iron & Steel Industry in Transition

RESEARCH PAPER

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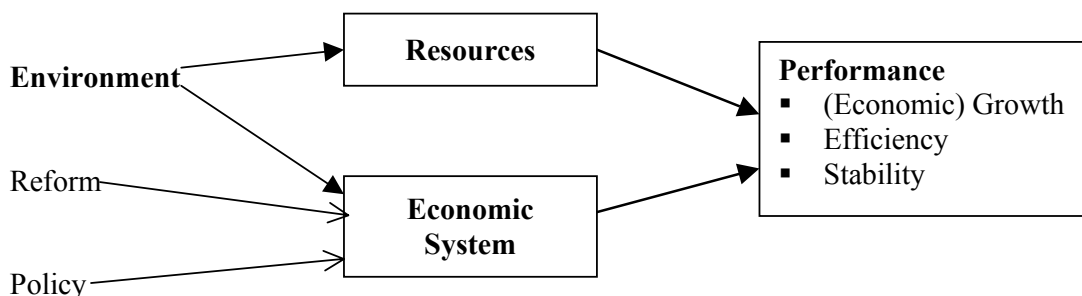
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INTRODUCTION

The main objectives of this paper are (a) to overview the Ukrainian ferrous metals sector, (b) to examine the performance of Ukraine's iron and steel industry during the post-communist transformation, (c) to discover major challenges the industry has been faced with since the beginning of the 1990s, and (d) to evaluate corporate and public policy responses vis-à-vis the challenging environment of transformation and globalisation. This paper proceeds in four sections. The first part sets the stage by introducing the Ukrainian ferrous metals industry and its major enterprises. The second section examines the economic outcomes generated by the Ukrainian iron and steel industry under post-communism. The third section establishes and identifies a number of basic short-term problems and fundamental long-term challenges of the Ukrainian steel industry with regard to technological advancement, market access and development, resource base, and ownership transformation. Finally, this paper analyses the industry's current corporate and public policy environment in Ukraine.

The project's overall methodological framework is developed along the lines of the study of comparative economic systems with its appropriate adaptation and simplification for the study of separate industries or sectors. The methodology is based on the works of John Elliot (1973), Andrew Zimbalist (1984), Morris Bornstein (1985), Stephen Gardner (1998), Paul Gregory and Robert Stuart (1999). It identifies the economic outcomes of the iron and steel industry as the dependent variable to be analysed through three basic criteria such as output and sales growth, efficiency, and stability. The independent variables are the resource base of the industry (=natural resources and raw materials, labour, and capital) and the economic system (=ownership arrangements and co-ordination mechanisms). Exogenous influences that affect the industry's performance – the environment – are regarded as an intervening variable. In addition, possible reform attempts and policies that the decision-makers choose to implement are considered to be the second intervening variable. Figure 1 provides an illustration of the present methodological framework.

Figure 1. Forces influencing economic outcomes



Source: Compiled on the basis of Ruud Knaack, 'Dynamic Comparative Economics: Lessons from Socialist Planning', in Andrew Zimbalist, ed., *Comparative Economic Systems: Present Views* (Boston: Kluwer-Nijhoff Publishing, 1984), pp. 109-132; H. Stephen Gardner, *Comparative Economic Systems*, 2nd edn (Fort Worth, TX: The Dryden Press, 1998); and Paul R. Gregory and Robert C. Stuart, *Comparative Economic Systems*, 6th edn (Boston: Houghton Mifflin, 1999).

INDUSTRY OVERVIEW

Prior to discussing the performance and challenges of the Ukrainian iron and steel industry under post-communism, one should overview the central characteristics of the ferrous metals sector. What was the magnitude of Ukraine's ferrous metals production within the Soviet Union and on the world scale? Where are the industrial capacities situated within the country? What are the industry's core products and major producers? How is the technological cycle organised? This section responds to the questions above.

During its 130 year-long history, the Ukrainian iron and steel industry has developed into a fully-grown manufacturing sector. It involves the entire technological cycle of economic activities designed for the production of iron, steel, and a large number of semi- and fully-finished metal products. The Ukrainian ferrous metals capacities include: (1) the extraction, processing and agglomeration of iron, manganese and chromic iron ores; (2) the extraction and processing of fire-clay, refractory and complementary materials; (3) the production of coal coke; (4) the production of cast iron, blast furnace ferroalloys, crude steel, rolled metals, steel tubes, electric ferroalloys, and special metal materials for mechanical engineering; (5) the recycling of scrap metal. The Ukrainian iron and steel industry also incorporates a large number of non-metallic raw material deposits, mining,

quarrying, and processing capacities, which produce flux, fire-clays, kaolin, dolomite, and metallurgical limestone.

The industry's historical development has been spatially located around huge iron ore and coal deposits, water resources, and electric power facilities of the Donbas-Dnieper Bend in the east of Ukraine. Beginning in the 1870s, the Ukrainian iron and steel industry provided the basis for the industrial expansion of the Imperial Russia. Subsequently, Ukraine's iron and steel works became a vital element in the Soviet Union's industrialisation drive under Stalin in the 1930s. Table 1 indicates that Ukraine's ferrous metals sector has maintained its significance for the Soviet economy throughout the entire historical period.

Table 1. Ukraine's ferrous metals sector within the USSR, 1986

	As % of total Soviet Union's output
Iron ore	48
Manganese ore	72
Pig iron	43
Crude steel	35
Finished rolled ferrous metals	35
Steel tubes	35
	<i>As % of total Soviet Union's size</i>
Ukraine's territory	2.7
Ukraine's population	18.2

Source: Author's calculations on the basis of USSR State Statistics Committee, *Narodnoe khoziaistvo SSSR za 70 let* (Moscow: Finansy i statistika, 1987); Ukrainian SSR State Statistics Committee, *Ukrainskaia SSR v tsifrah v 1988 godu* (Kyiv: Tekhnika, 1988).

Since the end of WWII, the overwhelming importance of the Ukrainian iron and steel industry for the economic development of the USSR had been gradually eroded by the development of new ferrous metals hubs in Central Russia and Siberia. Map 1 shows the wider geographical distribution of the Soviet metals sector achieved by the early 1980s.



Map 1. The geography of ferrous and non-ferrous metals centres in the USSR, 1982. Source: <http://www.1uptravel.com/worldmaps/russia54.html>

Nonetheless, by the end of state socialism, Ukraine had managed to remain one of the world's major metallurgical complexes. Table 2 demonstrates that in the mid-1980s, Ukraine's production of iron ore and crude steel was amongst the top 3 to 4 largest in the world.

Table 2. Ukraine's ferrous metals industry within the world, 1985-1986

Rank	Country	Crude steel	Rank	Country	Iron ore
		million tonnes (% of world output)			million tonnes
1.	USSR <i>of which, Ukraine</i>	161 (22) 56.6 (8)	1.	USSR <i>of which, Ukraine</i>	250 120
2.	Japan	98 (14)	2.	China	151
3.	United States	75 (10)	3.	Australia	91
4.	China	52.5 (7)	4.	Brazil	70
5.	West Germany	38 (5)	5.	United States	49
6.	Italy	23 (3)	6.	India	42
7.	Brazil	20.5 (3)	7.	Canada	40
8.	Poland	17.1 (2)	8.	South Africa	24.5
9.	Czechoslovakia	15.1 (2)	9.	Sweden	20.6
10.	United Kingdom	14.7 (2)	10.	Liberia	15

Source: Author's calculations on the basis of USSR State Statistics Committee, *Narodnoe khoziaistvo SSSR za 70 let* (Moscow: Finansy i statistika, 1987); Ukrainian SSR State Statistics Committee, *Ukrainskaia SSR v tsifrakh v 1988 godu* (Kyiv: Tekhnika, 1988); International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

In 1990, there were thirty two iron and steel works functioning in Ukraine. The Ukrainian iron and steel industry has long been characterised by one of the world's highest levels of industrial establishment concentration: 98 per cent of pig iron and 97 per cent of crude steel are produced by steel works with an annual crude steel output of over one million tonne per year.[†] One of the most common forms of the organisation of production in the Ukrainian ferrous metals industry has been *kombinat* – a combine of integrated complementary industrial factories processing iron ore materials, coking coal, casting iron, smelting and rolling steel, and manufacturing finished metal products. In addition to the complete production cycle enterprises, there has been a large number of iron and steel works with an exclusive specialisation in producing pig iron and crude steel. Reprocessing metallurgy has been concentrated on the electric furnace production of

[†] However, establishment (or plant-) concentration in a given market is usually much lower than firm-concentration. For instance, in 2002, the average annual crude steel output of the world's largest 80 steel producing companies was 7.7 million tonnes. The biggest Ukrainian steel company – Kryvorizhstal – produced 6.9 million tonnes that year.

finished rolled metals, special steels and ferroalloys. Apart from the large iron and steel works, ‘small metallurgy’ has also been present in the country. Small steel mills typically function within large heavy engineering companies and produce metal products for machine-building purposes. However, under post-communism, different foundries, rolling shops, and mills within several large steel combines have been divided into independent mini-mills or finished metals firms.

Geographically, the Ukrainian iron and steel works are concentrated in the Donbas-Dnieper Bend within three ferrous metals areas. A half of Ukraine’s steel works are located in the Donbas (Donets Coal Basin) – around the coal fuel resources – and at the coastal plain around the Sea of Azov – a natural commercial gate-way and transportation route. Another half of the iron and steel works are situated in the lower Dnieper River region – around the deposits of iron and manganese ores and vast water reservoirs. Thus, according to Ukraine’s current administrative division, almost the entire iron and steel industry is located in four neighbouring south-eastern provinces - Dnipropetrovsk, Zaporizhzhia, Donetsk, and Luhansk *oblasti* (see Map 2).

Fourteen iron and steel works are grouped around the lower Dnieper River region. The Dnipropetrovsk industrial hub includes ferrous metals enterprises located in the cities of Dnipropetrovsk (four), Dniprodzerzhynsk, and Novomoskovsk, which produce pig-iron, crude steel, rolled ferrous metals, steel tubes, railway wheels, bridge construction elements, and metal alloys. The Zaporizhzhia industrial hub includes three ferrous metals companies which produce pig-iron, thin hot- and cold-rolled slab steel, moulded steel, transformer steel, white plates, bent rolled metal profiles, cold rolled sheet steel for the motor-car industry, and special steels for the heavy engineering industry. The Kryvyi Rih industrial hub covers one of the world largest iron and manganese ore deposits, open-cast mines, Ukraine’s currently largest iron and steel complex of Kryvyi Rih, a number of ore mining and processing combines and agglomeration plants (Southern, Central, Northern, Kryvyi Rih, Sukha Balka, and Inhulets factories), as well as a tube-rolling plant and a ferroalloys factory, both at the town of Nikopol. Two manganese ore mining and processing combines – at Marhanets and Ordzenikidze – also operate in the surrounding area of Dnipropetrovsk oblast. In addition, the lower Dnieper River ferrous metals region includes the Kremenchuk iron ore deposits with its Poltava Ore Mining and Processing Combine.

The Donbas ferrous metals area includes thirteen iron and steel works, and the thirteen of Ukraine's eighteen coal coking plants. The Donetsk-Makiivka industrial hub consists of four ferrous metals works (two in each city respectively), a number of coal coking plants, tube-rolling mills, and fire-clay factories. A modernised iron and steel works and a new mini-mill are situated at the Yenakieve industrial hub. The Alchevsk industrial hub includes one of the largest iron and steel combines and a ferroalloys factory. The Khartsyzsk industrial hub includes three ferrous metals producing enterprises (one steel works, one tube mill, and one steel wire factory). There are also several independent iron and steel works in the Donbas cities of Kramatorsk and Kostiantynivka. Small steel mills function at almost each of Ukraine's largest heavy engineering factories. The ferrous metals area around the Sea of Azov includes the country's second and third largest steel-producing combines in Mariupol as well as a small iron and steel factory at Kerch and the iron ore deposits around the city of Kerch on the Crimean peninsula. The two iron and steel works in Mariupol produce iron, steel, and a wide range of rolled metals, consuming the raw materials from the Kerch and, partially, Kryvyi Rih iron ore deposits. The ferrous metals industry of this area is closely related to local heavy engineering factories, coal coking plants, as well as the companies that produce chemicals, fertilizers, and construction materials (for an historical overview of the Ukrainian metals sector see Chumachenko 1977: 90-117; Zastavnyi 1990: 113-116; Petryha 1999).

By the turn of the century, the majority of the Ukrainian steel works have been operating within a complete technological cycle of production, casting from 1 to 7 million tonnes of crude steel per year. Since the beginning of privatisation in 1992, the overwhelming majority of the steel works have been commercialised and either fully privatised or placed under the private corporate management control. In terms of the existing steel-making capacity[‡], Ukraine's largest steel producing companies are as follows: the Azovstal Iron and Steel Combine (Mariupol, (formerly Zhdanov), Donetsk oblast; 1999 reported capacity: 8.3 million tonnes of crude steel); the Mariupol Illich Iron and Steel Combine (Mariupol Donetsk oblast; 7.200 mln.); the Dniprospeetsstal Dnieper Special Steel Works

[‡] The steel-producing capacity figures are of 1999 as reported by the OECD 2001.

UKRAINE ADMINISTRATIVE DIVISIONS



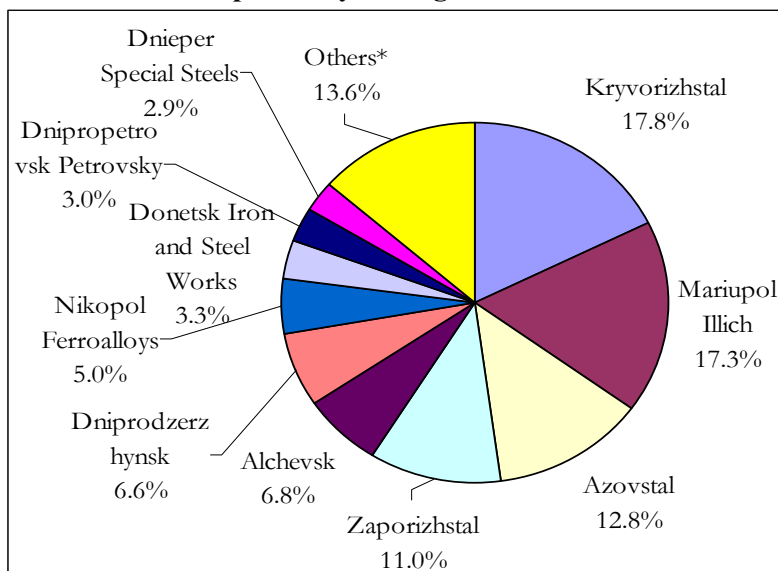
11770 (CAD) - December 2000 1219/00 Foreign and Commonwealth Office Map Series 156(2000)
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Map 2. Ukraine's current administrative divisions

Source: The UK Foreign and Commonwealth Office Map Service (<http://files.fco.gov.uk/info/research>)

(Zaporizhzhia; 5.800 mln.); the Kryvorizhstal State Iron and Steel Combine (Kryvyi Rih, Dnipropetrovsk oblast; 5.050 mln.)[§]; the Makiivka Kirov Iron and Steel Works (Makiivka, Donetsk oblast; 4.050 mln.); the Dniprovsky Dzerzhinsky Iron and Steel Combine (Dniprodzerzhynsk; 3.850 mln.); the Zaporizhstal Iron and Steel Combine (Zaporizhzhia; 3.600 mln.); the Alchevsk Iron and Steel Combine (Alchevsk (formerly Komunarsk), Luhansk oblast; 3.290 mln.); the Yenakieve Iron and Steel Works (Yenakieve, Donetsk oblast; 3.000 mln.); the Dnipropetrovsk Petrovsky Iron and Steel Works (Dnipropetrovsk; 1.000 mln.); the Kostiantynivka Iron and Steel Works (Kostiantynivka, Donetsk oblast; 1.000 mln.); the Donetsk Iron and Steel Works (Donetsk; 0.840 mln.); the ISTIL-Donetsk Iron and Steel Mini-Mill (Donetsk; 0.840 mln.); the Dnieper Special Steel Electrometallurgical Mill (Zaporizhzhia; 0.750 mln.); the Kramatorsk Iron and Steel Works (Kramatorsk, Donetsk oblast; 0.700 mln.); the Energomashspetsstal Energy Machine-Building Special Steel Mill (Kramatorsk, Donetsk oblast; 0.600 mln.). In terms of sales turnover, the current ranking order of the Ukrainian steel producers is different to some extent. Figure 2 assesses the size of Ukraine's ferrous metals companies by their latest annual sales figures reported. Between 1999 and 2002, the biggest five steel producers – Kryvorizhstal, Mariupol Illich, Azovstal, Zaporizhstal, and Alchevsk – had been making on average the two-thirds of industry sales, while over fifteen other companies accounted for another one-third of industry revenue turnover.

Figure 2. Ukraine's steel companies by average annual revenue share, 1999-2002



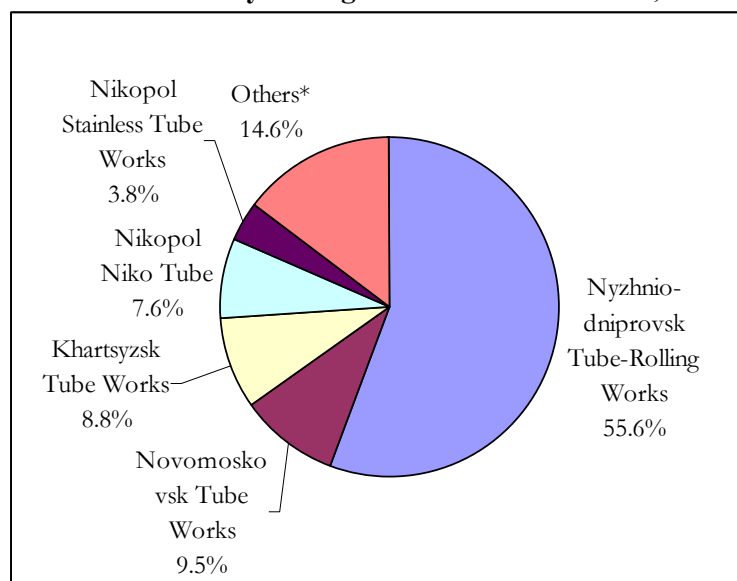
[§] Since 1999, Kryvorizhstal has been substantially increasing its production capacity to become the largest steel producer in Ukraine. It is the only fully state-owned Ukrainian steel producer.

Note: Others include the following ferrous metals-producing companies (by total sales revenues): Donetskstal Iron and Steel Works**, Zaporizhzhia Ferroalloys, Metalen Yenakieve**, Makiivka Iron and Steel Works, Donetsk Metal-Rolling Works**, ISTIL-DMZ**, Yenakieve Iron and Steel Works, Silur Khartsyzsk**, Stakhanov Ferroalloys, Kremenchuk Steel Works, Zaporizhzhia Abrasive Plant, Energomashspetsstal Kramatorsk. **Business start-ups.

Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2001* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2002* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

Given the specific market position of the tube-rolling branch of the Ukrainian iron and steel industry, companies which manufacture steel tubes are separated statistically from the rest of the ferrous metals producers. Figure 3 shows the average market sales shares of the Ukrainian tube-rolling mills. By contrast with the crude steel production, the tube branch of the ferrous metals sector has been much more heavily concentrated: a single producing company – the Nyzhniodniprovsk Tube-Rolling Works – controls over 55 per cent of the tube sales, while the combined share of the largest four tube-rolling enterprises (including the Niko Tube Nikopol Seamless Tube Works, the Novomoskovsk Tube Works, and the Khartsyzsk Tube Works) amounts to over 80 per cent of the total reported product sales.

Figure 3. Ukraine's tube mills by average annual revenue share, 1999-2002

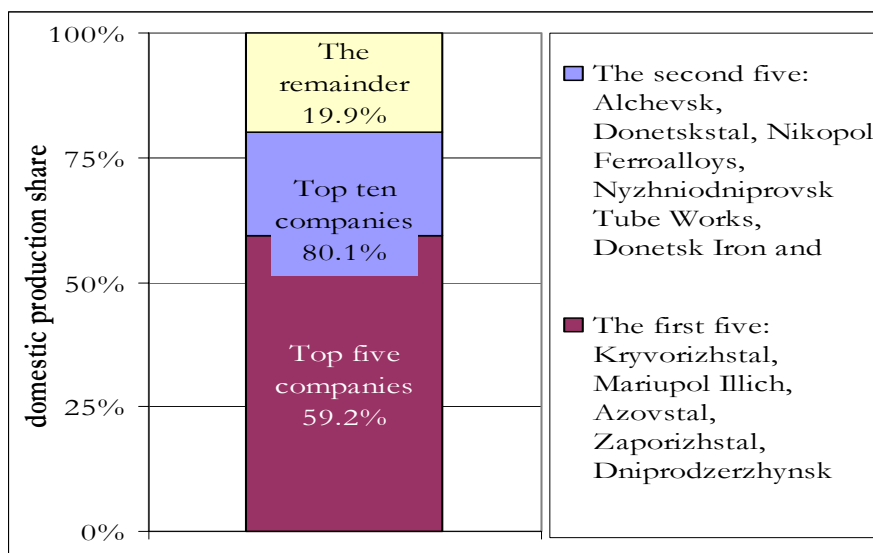


**Note:* Others include Nikopol Pivdennyi Tube Mill, Dnipropetrovsk Comintern Iron and Steel Works, Nikopol UTIST Steel Tube Mill, Dnipropetrovsk Tube Mill, Sumy Frunze Weighted Boring Tube Works, Luhansk Tube Works.

Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2001* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2002* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

This overview of the Ukrainian iron and steel industry is concluded with an assessment of the key element of the industry's market structure - its concentration. I have aggregated the annual gross revenue data of the Ukrainian ferrous metal-producing companies to examine whether the industry is dominated by a small number of large firms or made up of many small firms and what is the present degree of industrial concentration? Figure 4 covers Ukraine's iron and steel-producing companies and excludes iron and manganese ore mines, coal coking plants, and other raw materials firms. It shows that the Ukrainian ferrous metals sector has been characterised by a low level of industrial enterprise concentration. In 2002, the largest five steel companies accounted for 59 per cent of the total steel sales, while the gross revenue share of the top ten firms was 80 per cent of Ukraine's crude steel production.

Figure 4. The industrial concentration of the Ukrainian ferrous metals production, 2002



Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

The overall number of functioning iron and steel works, tube mills, ferroalloys factories, and other ferrous metal-producing enterprises – big enough to have an impact on the market – currently exceeds thirty. Moreover, during the post-communist transformation, Ukraine's ferrous metals sector on the whole has experienced some fragmentation, which was accompanied by a massive wave of newly-established iron and steel businesses, primarily in the field of steel products marketing and export facilitation. By the end of 2002, there were 2538 small firms** and 600 large companies registered in Ukraine as commercial entities under the institutional classification section of 'manufacture of basic metals and metal products' (author's calculations on the basis of Ukrainian State Statistics Committee 2003: Tables 7.4 and 14.37).

PERFORMANCE

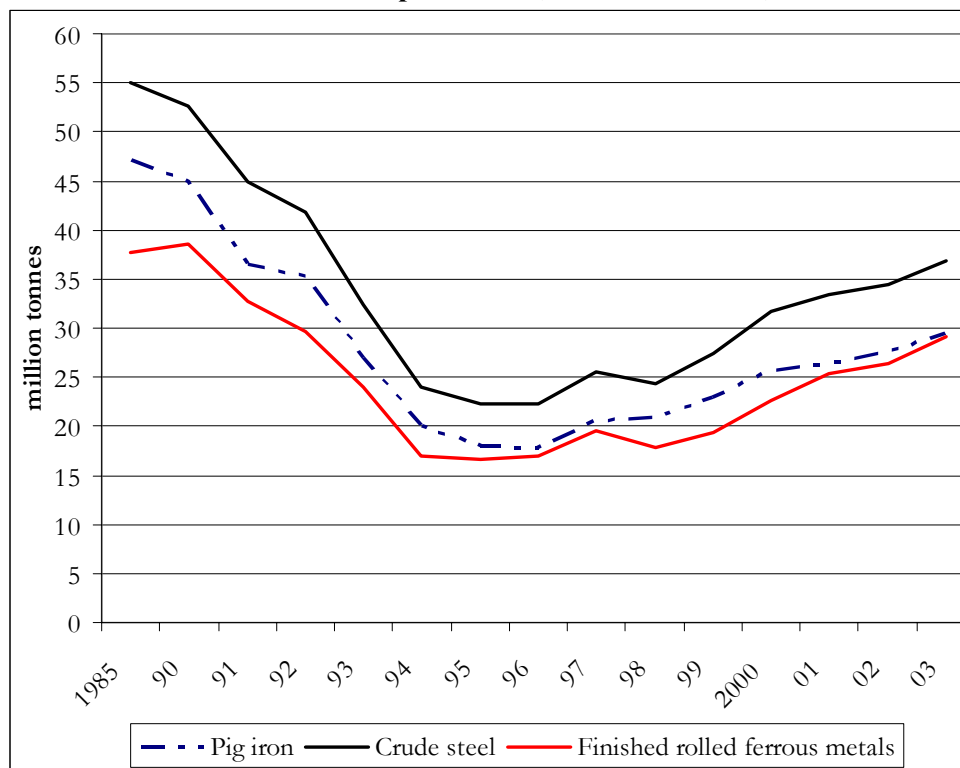
Having overviewed the general characteristics of the Ukrainian ferrous metals industry, this paper turns now towards examining the economic performance of the sector during the post-communist transformation. There are three core issues that this section is focused on. Firstly, it examines the growth trajectory of the Ukrainian ferrous metals output and market sales. Secondly, the corporate and export performance of the Ukrainian iron and steel producers is explored. Consequently, the section turns to the efficiency, productivity, and profitability patterns of the Ukrainian iron and steel industry. Finally, the issue of the industry's stability is discussed.

INDUSTRIAL GROWTH

The post-communist transformation has made an enormous impact on the Ukrainian iron and steel industry. Figure 5 shows that within the first five years of Ukraine's newly-gained independence, the production of ferrous metals plummeted by almost 60 per cent. This sharp output decline affected the entire range of the ferrous metals produced in the country, extending from pig iron, crude steel and rolled metals, to steel strips and tubes. The output collapse was the most dramatic in the tube-rolling branch of the industry, where the steel tube production suffered an almost 80 per cent decline (see Figure 6).

** According to the Ukrainian legislation, small firms are those which employ less than 50 employees and have the total annual turnover of less than 0.5 million euro.

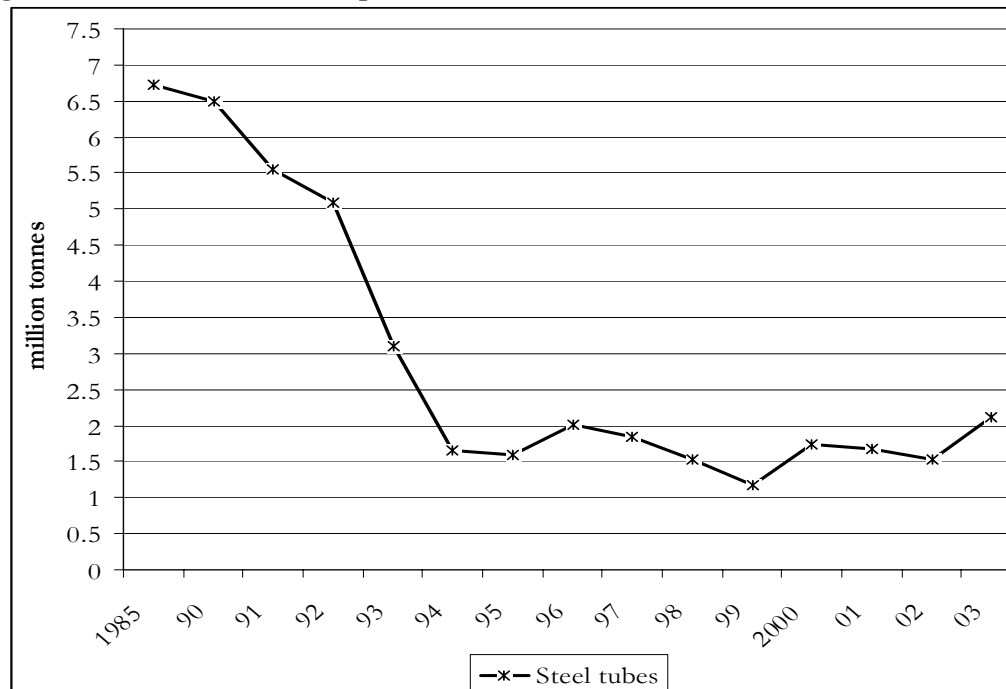
Figure 5. Ukraine's ferrous metals production, absolute volume, 1985-2003



Source: Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1995 rik* (Kyiv: Technical, 1996); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2000 rik* (Kyiv: Technical, 2001); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); and author's calculations on the basis of Ukrainian State Statistics Committee, *Vyrobnytstvo osnovnykh vydiv promyslovoi produktsii po misiatsiakh 2003 roku*; available at http://www.ukrstat.gov.ua/operativ/operativ2003/pr/ovp/ovp_u/arh_ovp.html.

In the second half of the 1990s, the Ukrainian iron and steel industry began to show some visible signs of recovery. Since 1996, all major ferrous metal products manufactured in Ukraine, especially finished steel products, have been indicating strong output growth trends in absolute volume terms. Moreover, Figure 5 shows that the revival of Ukraine's ferrous metals output has only been mildly affected by the subsequent Asian and Russian economic crises of 1997-1998. Since Russia's gas and oil giants remain the key consumers of Ukrainian steel tubes, Ukraine's tube-rolling mills have appeared to be the main victim of the Russian financial turmoil of 1998. However, as Figure 6 shows, the problematic environment of the world markets notwithstanding, the Ukrainian production of steel tubes has recently recovered to one-third of its pre-transition output level.

Figure 6. Ukraine's steel tube production, 1985-2003

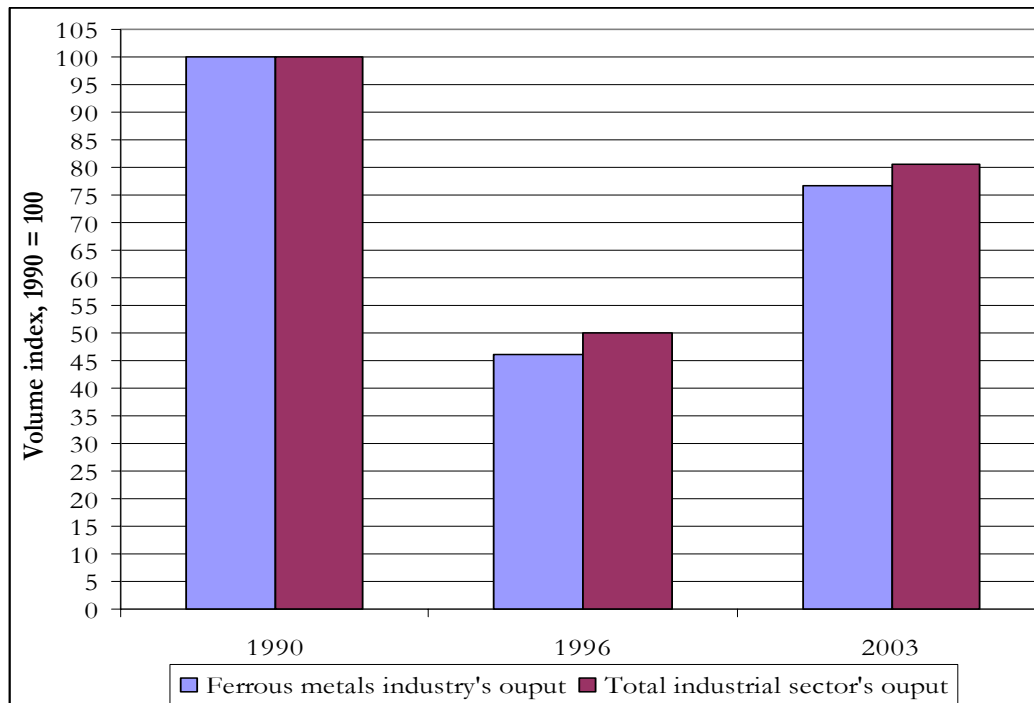


Source: Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1995 rik* (Kyiv: Technical, 1996); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2000 rik* (Kyiv: Technical, 2001); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); and author's calculations on the basis of Ukrainian State Statistics Committee, *Vyrobnytstvo osnovnykh vydiv promyslovoi produktsii po misiatsiakh 2003 roku*; available at http://www.ukrstat.gov.ua/operativ/operativ2003/pr/ovp/ovp_u/arh_ovp.html.

The recovery of the Ukrainian iron and steel industry has preceded the overall revival of Ukraine's economy by at least three years. Already in 1996, the Ukrainian steel industry recorded a 12 per cent annual sales increase. An 8 per cent growth followed in 1997. In 1998, however, the Russian financial crisis, the ensuing loss of export contracts, and, most importantly, the extensive depreciation of the Ukrainian currency resulted in a 7 percent decline of the Ukrainian steel industry's sales. The ferrous metals output in absolute volume terms did not decline to such an extent. Figure 7 illustrates another feature of the Ukrainian iron and steel industry's economic performance during the post-communist transformation, namely its deeper output slump, even if compared with the overall industrial sector's trajectory. By the end of 1995, Ukraine's ferrous metals industry had lost 59 per cent of its pre-transition production, whereas the corresponding figure for the entire industrial sector was 48 per cent. On the whole, in contrast to the experience of other heavily industrialised Central and Eastern European countries, the post-communist transformation has led to a distinct V-shaped response of the Ukrainian

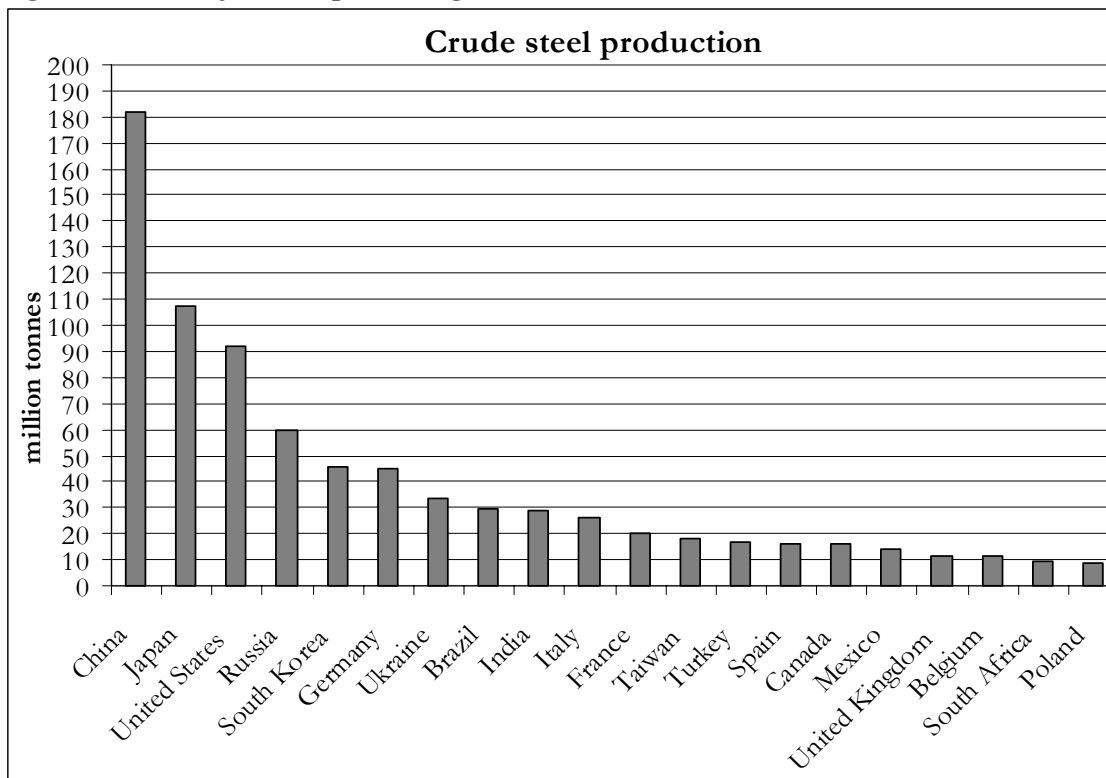
iron and steel industry. Figure 7 also shows that, since the second half of the 1990s, a protracted and deep fall in Ukraine's ferrous metals sales has been followed by rapid recovery.

Figure 7. Ukraine's industrial sector and ferrous metals industry growth patterns, volume indices, 1990-2003



Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); National Bank of Ukraine, *Osnovni pokaznyky ekonomichnoho i sotsial'noho stanu Ukrainy 2001-2004 roky* (Kyiv: National Bank, 2004); Ukrainian State Statistics Committee, *Vyrobnytstvo ta tempy pryrostu obsiahiv promyslovoi produktsii: Operatyvni danni* (Kyiv: Derzhkomstat, 2004).

On the international scale, the turn of the Ukrainian iron and steel industry towards recovery has put the country back into the league of the largest steel producing countries. Figure 8 shows that in 2002 Ukraine occupied the seventh position. The country produced more crude steel than Brazil, India and Italy, but was firmly behind Russia, South Korea, Germany, and the world's top three steel-producing giants (China, Japan, and the United States).

Figure 8. The major steel-producing countries, 2002

Source: International Iron and Steel Institute, *Steel Statistical Yearbook 2003* (Brussels: IISI, 2004); International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

EXPORTS GROWTH

The apparent recovery of Ukraine's ferrous metals sector has been propelled by a remarkable export expansion. Between 1990 and 2002, Ukraine's share in the world steel production halved to 4 per cent. Notwithstanding, by the late 1990s, Ukraine became one of the world's top three major steel-exporting countries. Table 3 indicates that considering net export figures, Ukraine has almost become the world's second largest steel exporter. Moreover, according to the national statistical account, in 2002, Ukraine exported 32 million tonnes of ferrous metals – the second largest amount of steel exports in the world after Japan. On the whole, the Ukrainian iron and steel companies have been exporting between 75 and 80 per cent of the domestically produced steel. Several Ukrainian iron and steel works have recently appeared in the league of the world's largest steel exporting companies.

Table 3. The major exporters and importers of steel, million tonnes, 2002

Rank	Total exports		Rank	Total imports	
1	Japan	35.2	1	United States	30.2
2	Russia	27.7	2	China	29.2
3	Ukraine	25.9	3	Germany	17.8
4	Germany	24.7	4	Italy	16.6
5	Belgium-Luxembourg	20.3	5	France	15.8
6	France	17.6	6	South Korea	14.1
7	South Korea	12.9	7	Belgium-Luxembourg	10.9
8	Brazil	11.8	8	Taiwan	10.9
9	Italy	11.4	9	Spain	10.4
10	Turkey	11.0	10	Thailand	9.8
11	Taiwan	8.8	11	United Kingdom	8.9
12	Netherlands	7.2	12	Hong Kong	7.9
13	China	6.8	13	Canada	7.7
14	United Kingdom	6.6	14	Turkey	6.6
15	Spain	6.3	15	Mexico	5.8
<i>World</i>	<i>Total</i>	<i>317.4</i>	<i>World</i>	<i>Total</i>	<i>310.1</i>
Rank	<i>Net exports (exports-imports)</i>		Rank	<i>Net imports (imports-exports)</i>	
1	Japan	31.9	1	United States	24.6
2	Russia	25.54	2	China	22.4
3	Ukraine	25.52	3	Hong Kong	5.4
4	Brazil	11.0	4	Thailand	8.2
5	Belgium-Luxembourg	9.4	5	Italy	5.2
6	Germany	6.9	6	Iran	4.5
7	Turkey	4.3	7	Spain	4.1
8	Kazakhstan	3.7	8	Vietnam	4.6
9	South Africa	3.0	9	United Arab Emirates	2.9
10	Austria	2.4	10	Malaysia	2.8
11	Romania	2.4	11	Portugal	2.5
12	Argentina	2.2	12	Indonesia	2.4
13	Venezuela	2.0	13	Singapore	2.38
14	India	1.8	14	United Kingdom	2.2
15	Netherlands	1.7	15	Philippines	1.7

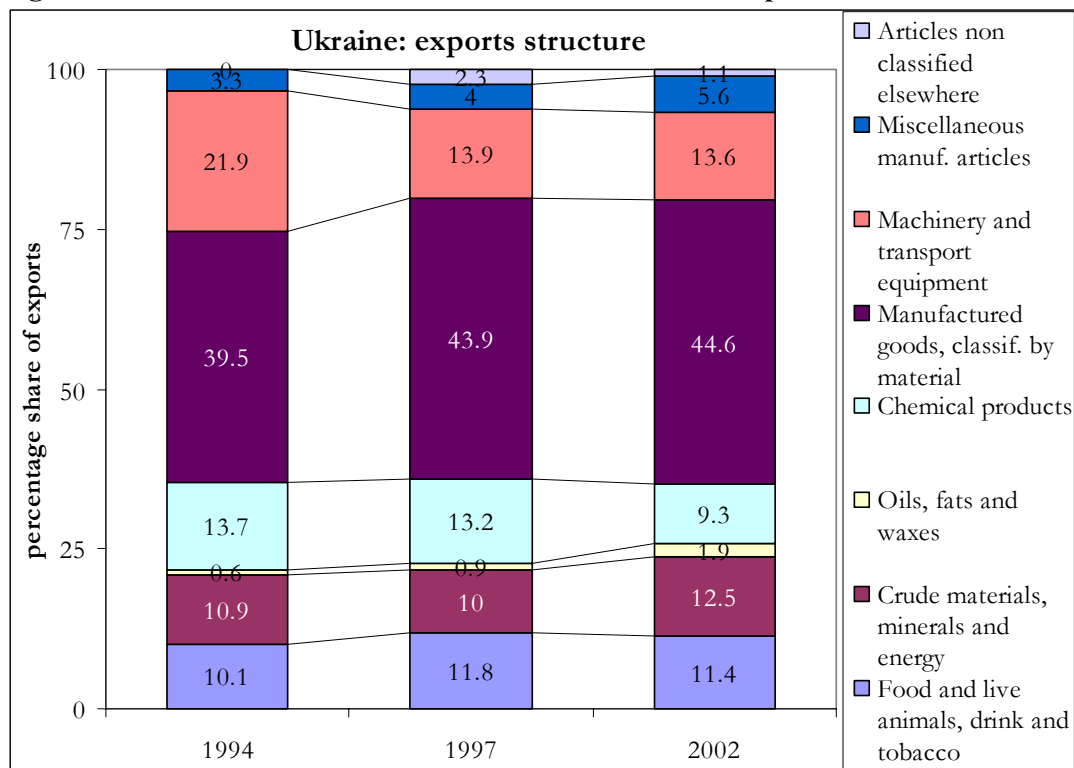
Note: Some of the IISI data in this table are based on exporters' figures and understate the actual volume of imports.

Source: Author's calculations on the basis of International Iron and Steel Institute, *Steel Statistical Yearbook 2003* (Brussels: IISI, 2004); International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

The role of steel exports for the Ukrainian economy has been steadily increasing (see Figure 9). Between 1994 and 2002, the share of base metals and metal products – the key component of the statistical category of ‘manufactured goods, classified chiefly by material’ – in Ukraine’s total merchandise exports expanded from 39.5 to 44.6 per cent (or from US\$ 3,721 million to US\$ 7,126 million). In the course of the post-communist transformation, steel products have become the single largest Ukrainian export

commodity, accounting in 2002 for 30 per cent of the country's total merchandise exports and worth US\$ 5,300 million.

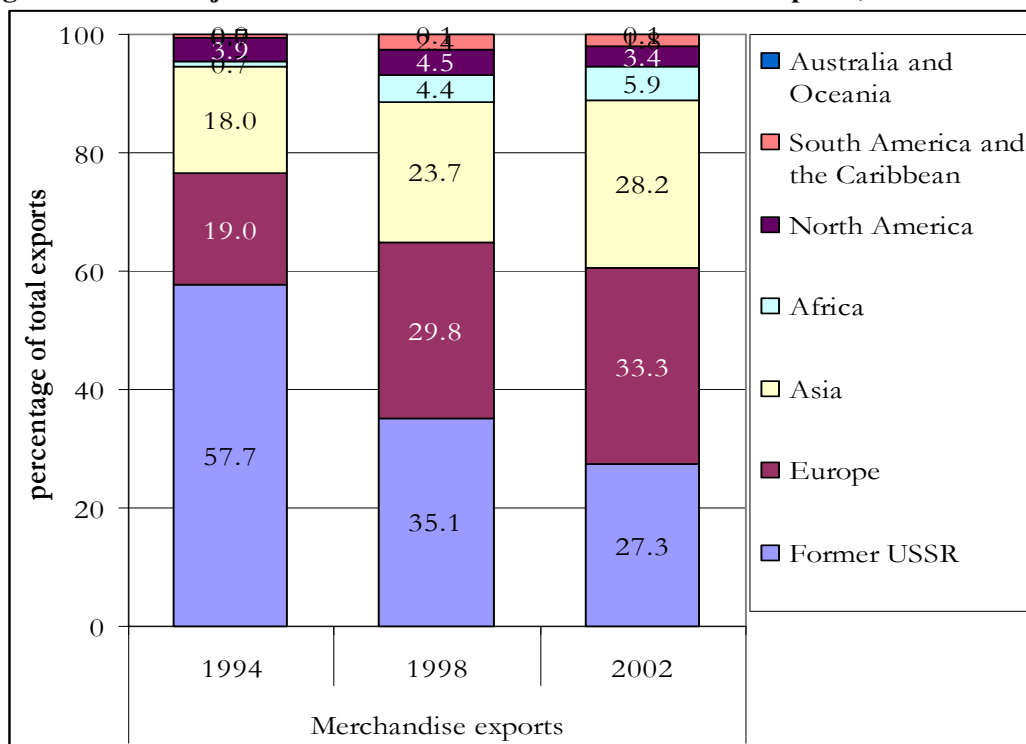
Figure 9. The break-down of the Ukrainian merchandise exports, 1994-2002



Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1994 rik* (Kyiv: Technical, 1995); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003).

Figure 10 shows the major geographical destinations of Ukraine's merchandise exports. The primary targets for the Ukrainian steel export are China, the countries of South-East Asia, Russia and the former Soviet Union, Eastern Europe, and some EU member states. The rest of the world appears to be of secondary importance, as the great bulk of the Ukrainian steel export has been barred from the U.S. market. Although the data on the geographical distribution of ferrous metals exported from Ukraine are not widely available, it is contended that the illustration provided in Figure 10 is rather accurate in this regard.

Figure 10. The major destinations of Ukrainian merchandise exports, 1994-2002

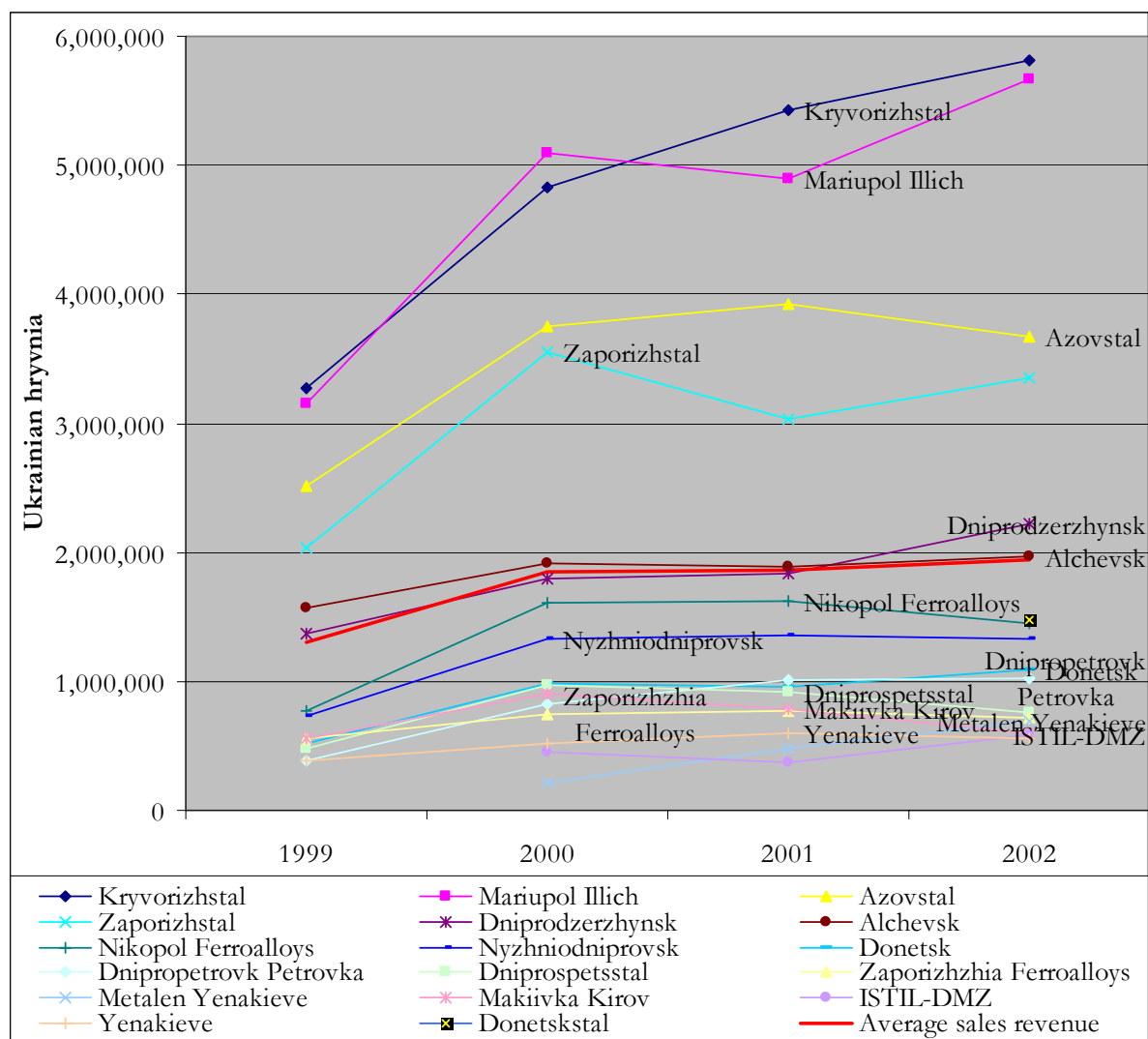


Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1994 rik* (Kyiv: Technical, 1995); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003).

CORPORATE PERFORMANCE

The overall examination of the Ukrainian iron and steel industry's growth and export patterns under post-communism would be incomplete without an analysis of its corporate performance. Therefore, in this subsection the industrial output trends are disaggregated according to sales and export revenues of different iron and steel-producing companies. By separating the Ukrainian producers of ferrous metals by size, one can see more clearly the difference in scale between them as well as what type of companies has been behind the recent industrial recovery. Figure 11 shows the gross revenue growth figures reported by Ukraine's largest iron and steel works, while the market sales performance of the small producers of ferrous metals is provided in Figure 12.

Figure 11. Ukraine's large ferrous metals companies, gross revenue growth, 1999-2002

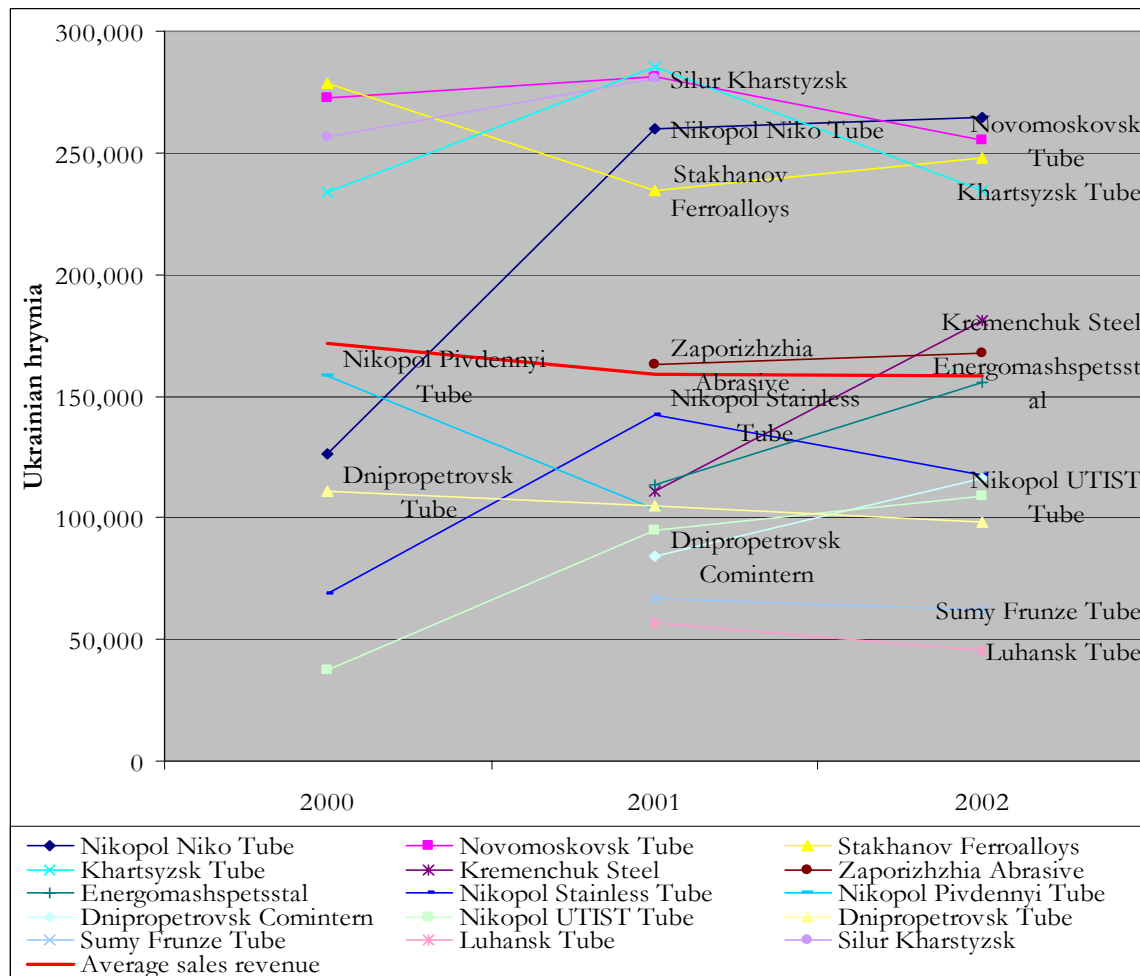


Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2001* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2002* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

The first remarkable corporate feature of the post-communist transformation of the Ukrainian iron and steel industry has been the massive difference in sales revenues. Figure 11 shows that in 2002, the annual gross revenue of an average large Ukrainian steel company approached 2 billion hryvnia (over US\$ 370 million), while each of the two steel giants – Kryvorizhstal and Mariupol Illich – sold steel products worth well over US\$ 1 billion. Figure 12 indicates that the corresponding figure for Ukraine's small steel

producers, predominantly tube-rolling mills, has been just 158,000 hryvnia or US\$ 30,000.

Figure 12. Ukraine's small ferrous metals companies, gross revenue growth, 1999-2002

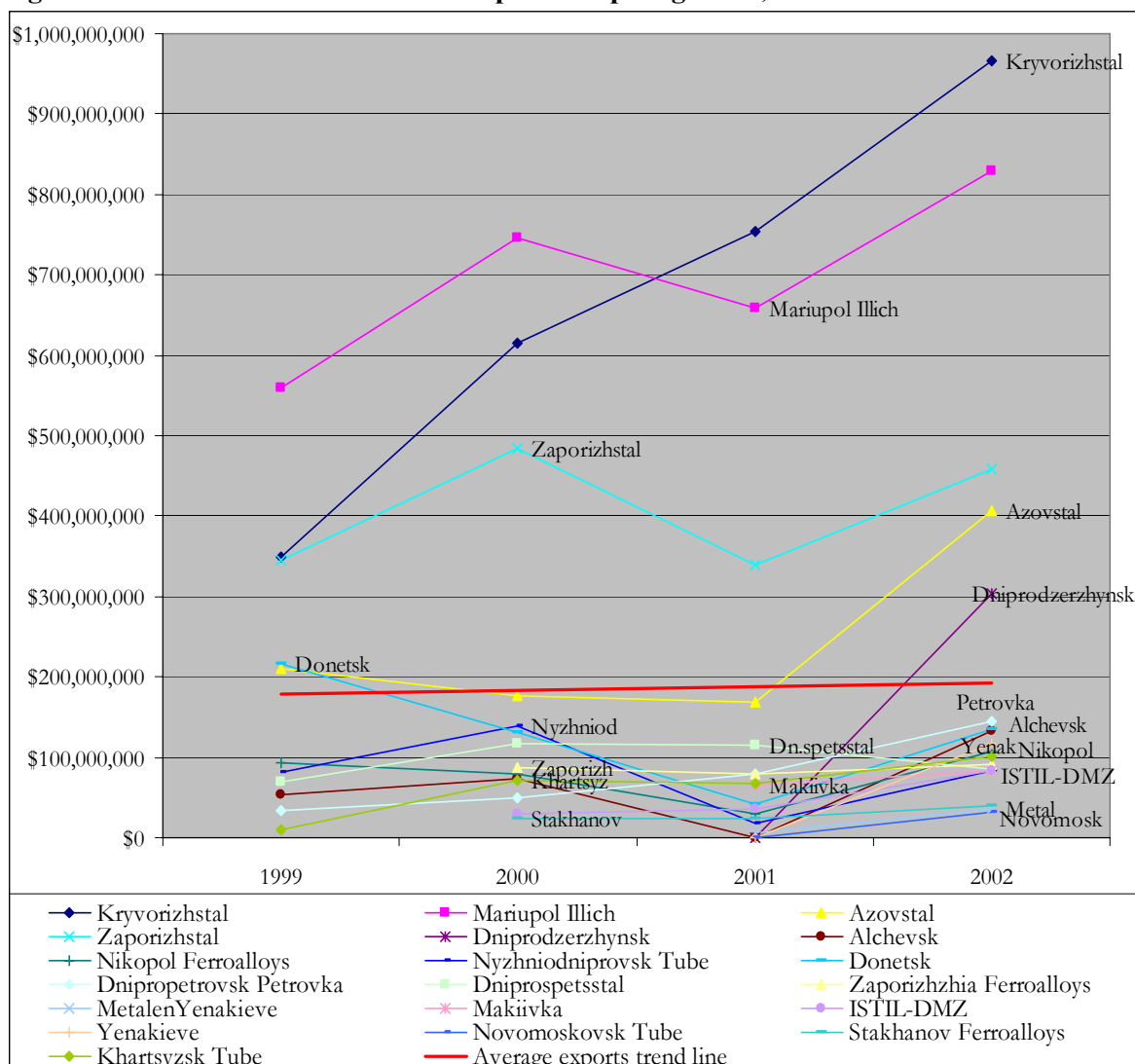


Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2001* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2002* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

Another major finding is that it is the large steel companies that have emerged as the locomotive of the industry's revival; the sales reported by the big companies have been registering a steady growth tendency, whereas the small producers' sales figures have been in decline. Figure 13 indicates that, similarly to the overall gross revenue trajectory, the largest Ukrainian steel companies have appeared to be the biggest exporters as well.

However, most recently, the export sales have not been growing as fast as the overall market sales. Moreover, except for the constantly expanding Kryvorizhstal Iron and Steel Combine and the other four largest companies, the sales performance of the majority of Ukraine's steel firms has been rather erratic. This tendency can be observed most vividly in the field of exports as illustrated in Figure 13.

Figure 13. Ukraine's iron and steel companies export growth, 1999-2002



Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2001* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2002* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

Thus, the disaggregated data analysed in this subsection allow for the following conclusions. First of all, the overall sales performance of the Ukrainian iron and steel companies has generally corresponded with the overall industry's recovery and economic growth in Ukraine. However, while the production of major ferrous metals has been steadily increasing in absolute volume as well as in terms of sales since 1996, the annual revenues and export performance of the majority of the Ukrainian steel companies have been rather erratic. A small number of ferrous metals companies have recently taken the leading market positions, whereas the majority of Ukraine's steel companies have been lagging far behind, and some are in an apparent decline.

EFFICIENCY

Industrial growth understood as an increase in the volume of output or sales is the first criterion of a sector's economic performance. Another essential criterion for the assessment of industrial performance is efficiency. Economics is primarily focused on an abstract Pareto-optimal efficiency of perfect competition, where 'no one could be made better off without making someone else worse off'. There are three types of economic efficiency discussed in the literature. Roughly defined, the first type is *productive efficiency*, in which the output of the industry is produced at the lowest cost. The second is *allocative efficiency*, in which resources are allocated to the production of the goods and services the society requires. The third is *distributional efficiency*, in which output is distributed in such a way that consumers would not wish – within their disposable income and market price constraints – to spend these incomes in a different way (Bannock, Baxter, and Davis 1992: 127).

As economists emphasise, maximum economic efficiency can exist only in an ideal-type economy, in which perfect competition characterise every sector. By focusing on the efficiency of the real-world economic system, one aims at measuring the effectiveness with which a system uses its resources at a given time (static efficiency) or through time (dynamic efficiency). It is also important to understand different growth experiences, while studying economic systems. As Gregory and Stuart have emphasised:

Economic growth and dynamic efficiency are not the same. The output of a system may grow by increasing efficiency (finding better ways of doing things with the same resources) or by expanding the amount of, say, labour

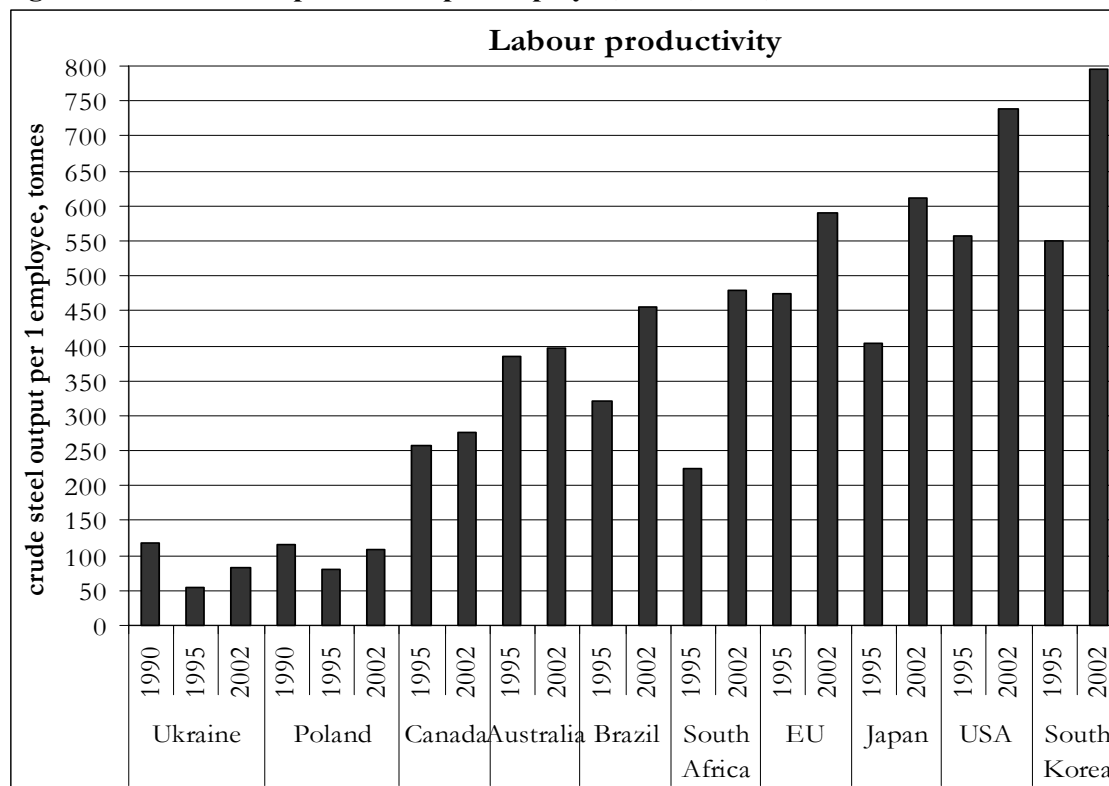
but using that labour at a constant rate of effectiveness. The former is often termed **intensive growth**, the latter **extensive growth** (1999: 44).

It is very difficult to measure economic efficiency, given the technological complexity of the modern manufacturing as well as the lack of data needed to analyse all the types of efficiency both in static and dynamic terms. Furthermore, the allocative and distributional aspects of economic efficiency are typically attributed to a country's economy as whole rather than to a specific sector or an industry. This research paper's approach is to focus on the productive efficiency of the Ukrainian iron and steel industry, which is evaluated comparatively on the 'output per employee' basis as well as in terms of enterprise profitability. As in the previous part of the paper, this section uses the statistical data set which has been specifically assembled to reveal the performance patterns of Ukraine's ferrous metals industry during the post-communist transformation.

Figure 14 provides the data on labour productivity in a number of the world's largest steel-producing countries. Various differences in coverage and definition of 'employment in the steel industry' exist: in some countries the entire ferrous metals industry's workforce is included, while in other countries the steel industry's employment covers only the shop floor. Furthermore, some national statistical agencies provide the employment data for the ferrous metals sector, whilst other agencies cover the employment in the 'manufacturing of base metals and metal products', which include non-ferrous metals as well. Given the International Iron and Steel Institute's own conclusion that 'inter-country comparisons are of dubious value' (2003: 19), one has to be cautious in this regard. The labour productivity data on Ukraine and Poland presented in Figure 14 are directly comparable as they have been gathered specially for this paper following the analogous techniques. The productivity figures for other major steel-producing countries were calculated on the basis of the steel employment data provided by the IISI. Figure 14 shows that labour productivity in the two East European steel industries has been significantly lower throughout the entire period than in any other major steel industry, for which the data are available. Even after a considerable recovery in labour productivity terms which has been achieved in Ukraine since 1995, the average Ukrainian steel worker produces currently only 70 per cent of his 1990 output level. Comparing to the ferrous metals sector in the other countries, the average Ukrainian steel worker produces only 76 per cent of the average Polish steel worker's output, 18 per cent of the average Brazilian steel worker's output, 14 per cent of the average EU steel

worker's output, 11 per cent of the U.S. output per worker level, and 10 per cent of the average South Korean steel worker's output.

Figure 14. Crude steel production per employee, 1990, 1995, 2002

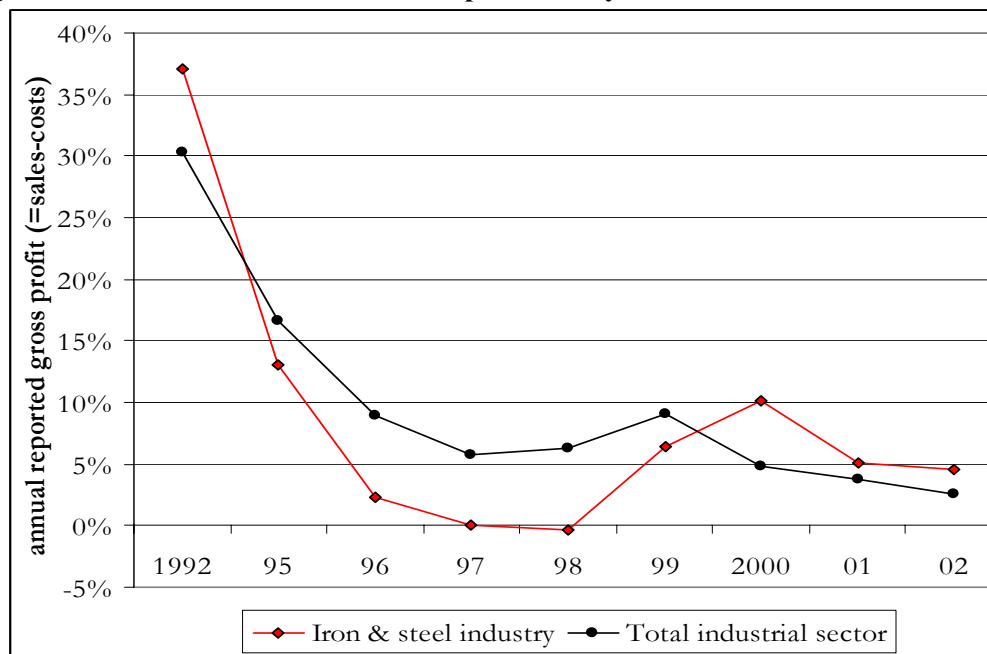


Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); Polish Central Statistical Office, *Statistical Yearbook of the Republic of Poland 2000* (Warsaw: GUS, 2001); Polish Central Statistical Office, *Statistical Yearbook of the Republic of Poland 2002* (Warsaw: GUS, 2003); International Iron and Steel Institute, *Steel Statistical Yearbook 2003* (Brussels: IISI, 2004); International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

Whether a firm makes a profit or a loss is regarded as the second signal of its productive efficiency. The evolution of profitability rates (understood here formally as total sales revenue minus total production costs) of the Ukrainian iron and steel industry is given in Figure 15. Here the steel industry characteristics are contrasted with the profitability trends of Ukraine's overall industrial sector. On the whole, the Ukrainian iron and steel industry during the post-communist transformation has been characterised by mediocre and falling profitability rates. It is believed that very high industrial profitability rates of the early 1990s should be regarded with some caution. Following the price liberalisation, the producer prices rose in 1992 by a staggering 4,229 per cent, while the consumer price

index inflation that year was 2,100 per cent. In 1993, the producer price index was up by 9,768 per cent, whereas the CPI inflation rose to 10,256 per cent. In such an unstable environment, Ukraine's industrial enterprises were able to acquire bank credits under what appeared to be effectively negative interest rates. For example, between 1992 and 1993, the amount of commercial credit debts had grown by 28 times. Figure 15 demonstrates that the profitability patterns of the industrial sector and its steel branch have been roughly similar. Notwithstanding the generally dubious profitability data due to profit underreporting practices, which are wide-spread in most of the post-communist economies, Figure 15 also shows until very recently that the profitability of the Ukrainian ferrous metals industry has fallen considerably and that the production of ferrous metals has been less profitable than the production of other industrial goods. Moreover, the steel manufacturers made no profits in 1997 and even registered a loss the following year. At the very end of the 1999, the Ukrainian ferrous metals companies returned to profit-making.

Figure 15. Ukraine's annual industrial profitability trends, 1992-2002

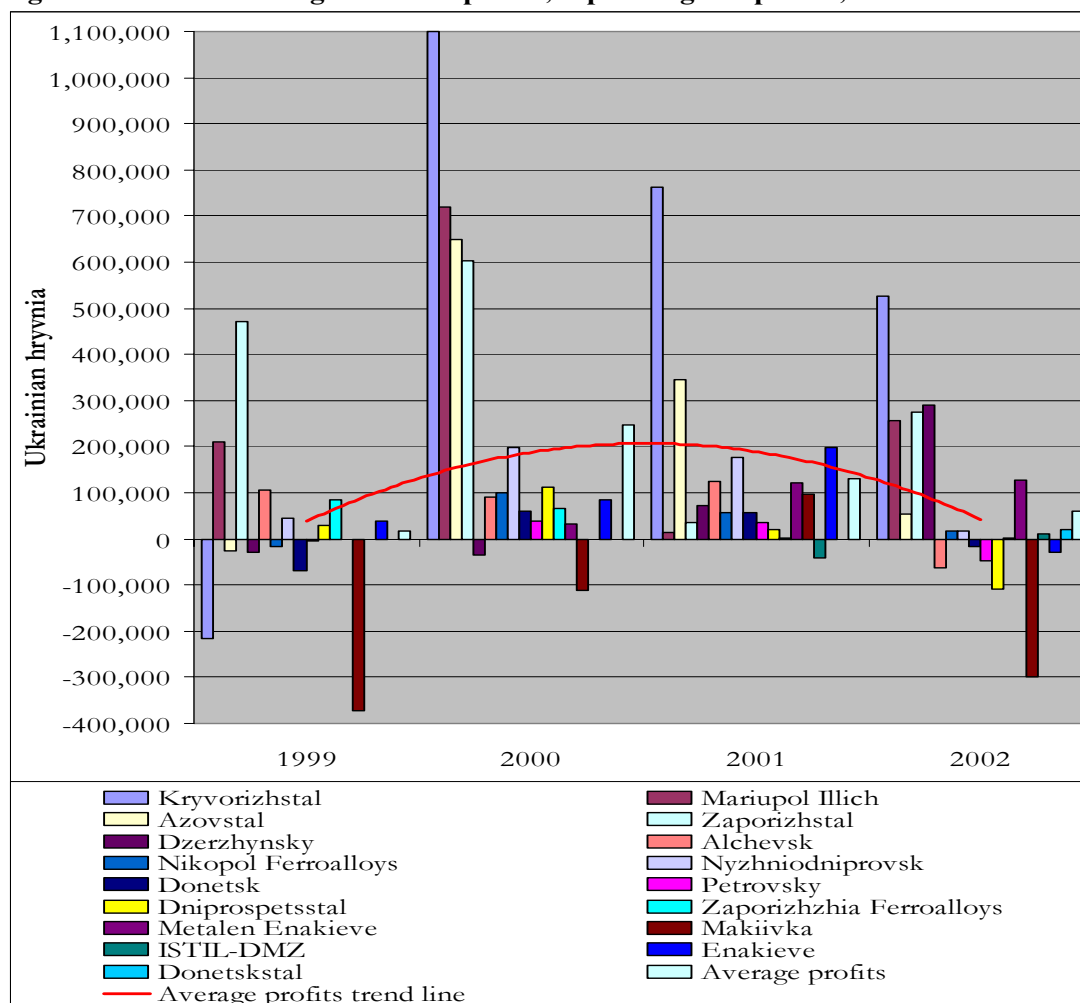


Source: Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003).

Figure 16 provides the latest available disaggregate statistics concerning the profit figures reported by the largest Ukrainian iron and steel companies. It shows that all but two large

steel companies have registered a massive rise in profits in 2000, with an average gross profit figure approaching 250,000 hryvnia (or US\$ 46,000). Nevertheless, from 2001 onward the reported profits of all the companies have been falling yet again.

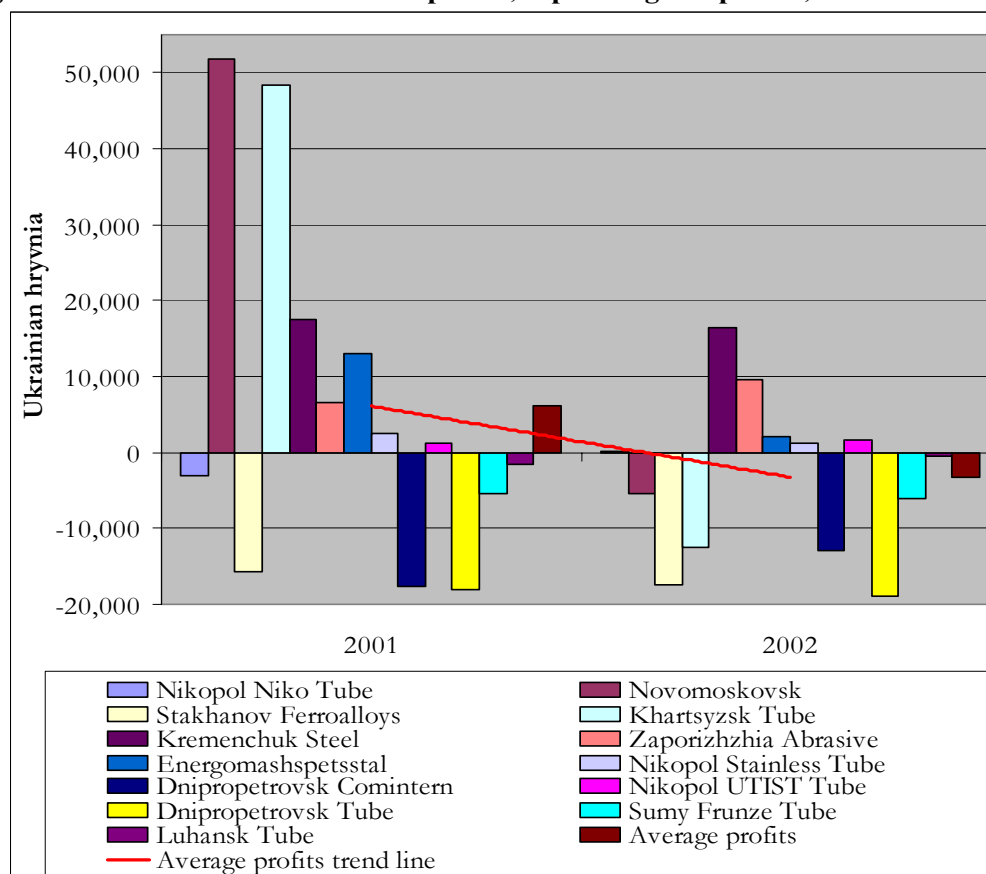
Figure 16. Ukraine's large steel companies, reported gross profits, 1999-2002



Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2001* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2002* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

The profit patterns of Ukraine's smaller ferrous metals companies within the reported period have been even more dismal. Figure 17 indicates that the profits of Ukraine's tuberoiling and ferroalloy-producing mills have not only rapidly declined, but by 2003 the majority of the smaller companies have been making losses.

Figure 17. Ukraine's small steel companies, reported gross profits, 1999-2002



Source: Author's calculations on the basis of Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2001* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy 2002* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

It should be emphasised, however, that low returns and financial losses have been one of the major features of the world steel industry for a very long time. As the British conservative weekly *The Economist* has recently put it: 'Even by "old economy" standards, steel making is hardly a business that sets pulses racing' (22 February 2001). For instance, during the world steel industry's boom in 2000, the West European steel giants – Arbed, ThyssenKrupp, and Usinor – reported returns on equity to be only between 12 and 15 per cent (*The Economist*, 23 November 2000). Thus, the lack of spectacular profit figures coming from the Ukrainian iron and steel companies ought to be at least partially attributed to a fiercely competitive environment of the world steel markets. Nonetheless, having considered the efficiency outcome of the post-communist

transformation, one has to conclude that the overall productive efficiency of the Ukrainian iron and steel industry has been very low. The reported profit margins of the overwhelming majority of the steel companies, albeit recovering, are still considerably narrow; and the average Ukrainian steel worker has not only become one of the least productive in the world, but he has been producing less output under post-communism than he used to produce under late state socialism.

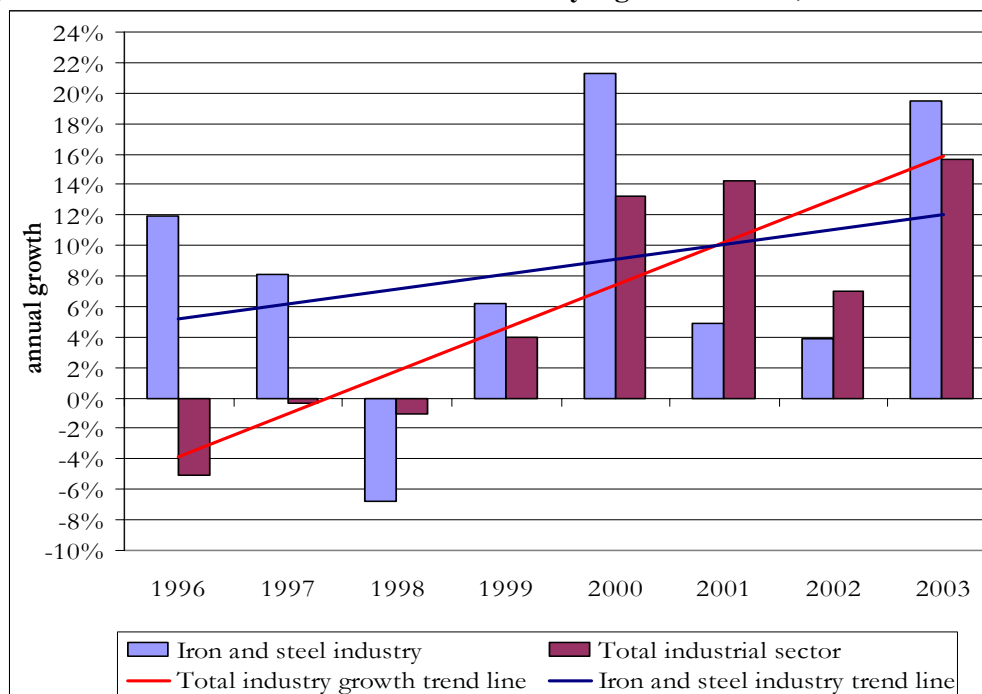
STABILITY

In addition to increases in the volume of output that an industry generates over time, and to effectiveness with which an industrial enterprise utilises its available resources, stability is considered to be another essential criterion used in assessing economic performance. This sub-section examines the economic stability of Ukraine's ferrous metals sector during the post-communist transformation. The focus here is on the industry's trade (or business) cycles, i.e. fluctuations in growth. The trade cycle, understood as regular fluctuations in the level of income, is a very common economic phenomenon. Although there exists no general agreement in the economic theory about the exact cause of cycles, this problem has been well-studied by a large number of prominent economists, including Kondratieff, Kuznets, Samuelson, Hicks, Goodwin, Phillips and Kalecki. Since the times of the Great Depression in the early 1930s, most governments of industrially advanced countries have been trying to develop an economic policy to reduce the amplitude of the cycle and to stabilise the output on a generally upward growth trend path. The great output contractions experienced during the initial stages of the post-communist transformation have heated the theoretical debate and produced a number of competing approaches. This paper considers possible causes of the post-communist 'Great Contraction' of Ukraine's ferrous metals sector in the next section.

With regard to the economic outcomes of the Ukrainian iron and steel industry, there appears to be two similarly 'stable' periods in the industry's post-communist development. The production of ferrous metals had been steadily declining during the first transformation phase, which lasted until 1996. From then onwards the output as well as the sales of most steel products have been steadily on the rise. Moreover, since the late 1990s, the industry's most troubled tube-rolling branch has not experienced any major

negative growth trajectory. However, if one examines the two distinct output growth periods jointly, it becomes evident that the performance of the Ukrainian iron and steel industry during the post-communist 1990s has been particularly uneven: a sharp 59 per cent decline in production between 1990 and 1995 has been followed by a fast 36 percentage point recovery by 2004, when the Ukrainian ferrous metals sector approached 77 per cent of its 1990 production level in monetary terms. Furthermore, Figure 18 clearly indicates that the recovery of the Ukrainian ferrous metals sector has been rather unbalanced as well. The annual growth rates have been fluctuating from 8.1 per cent in 1997 to -6.8 per cent in 1998; from 21.3 per cent in 2000 to 3.9 per cent in 2002 and to 19.5 per cent in 2003. Figure 18 also shows that the recovery trajectory of Ukraine's total industrial sector has been much steadier. Nonetheless, one should accentuate that since the second half of the 1990s, the Ukrainian iron and steel industry has followed a generally upward growth path.

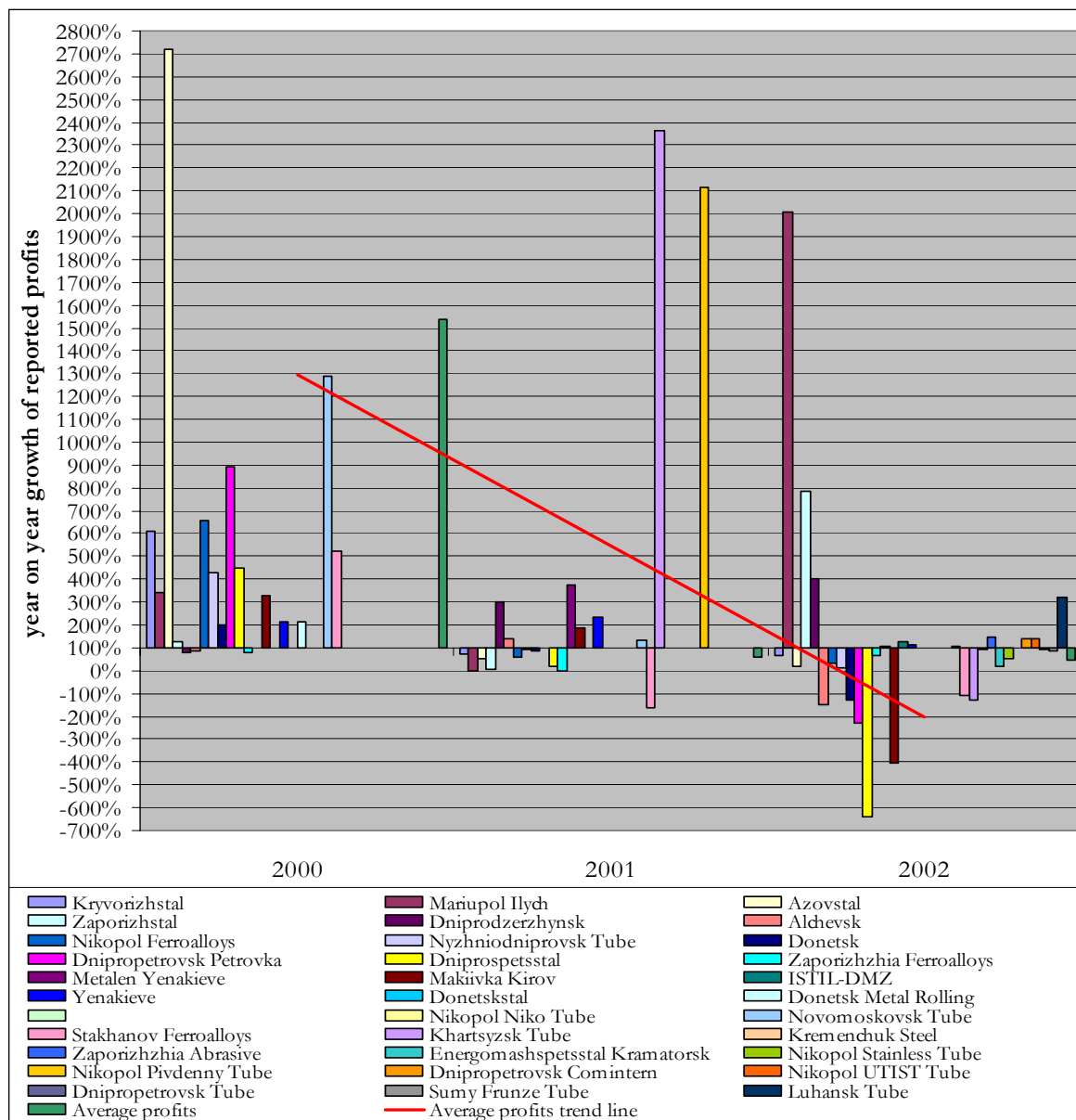
Figure 18. The Ukrainian iron and steel industry's growth trends, 1996-2003



Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); National Bank of Ukraine, *Osnovni pokaznyky ekonomichnoho i sotsial'noho stanu Ukrainy 2001-2004 roky* (Kyiv: National Bank, 2004); Ukrainian State Statistics Committee, *Vyrobnytstvo ta tempy pryrostu obsiahiv promyslovoi produktsii: Operatyvni danni* (Kyiv: Derzhkomstat, 2004).

Another highly unstable feature of the Ukrainian iron and steel industry during the post-communist transformation has been the corporate profit growth rates. Figure 19 shows that between 2000 and 2002 Ukraine's ferrous metals companies reported annual profit figures ranging from an average growth of 1540 per cent in 2000 to an average 50 per cent loss in 2001 and 2002. Thus, the era of the post-communist transformation has been an extremely unstable period for the Ukrainian steel companies' profits. The sales and output growth rates, price levels and profit figures have all registered massive declines to be followed by rather rapid increases both of cyclical and non-cyclical nature.

Figure 19. Annual profit growth reported by Ukraine's iron and steel companies, 2000-2002



Source: Author's calculations on the basis of Ukrainian Investment Gazette, Top 100: Reiting luchshykh kompanii Ukrainy 2001 (Kyiv: Ukrainskaia Investitsionnaia Gazeta, May 2001); Ukrainian Investment Gazette, Top 100: Reiting luchshykh kompanii Ukrainy 2002 (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2002); Ukrainian Investment Gazette, Top 100: Reiting luchshykh kompanii Ukrainy (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003).

THE INDUSTRY'S POST-COMMUNIST CHALLENGES

To understand whether and how the Ukrainian iron and steel industry can be made sustainable in the long run, one has to question the factors behind the sector's 'Great Post-Communist Contraction' and the industry's overall unbalanced economic and commercial performance. Firstly, this third part of the research paper considers the applicability of the traditional 'declining industry' hypothesis, which is related to the phenomenon of 'de-industrialisation' experienced by the industrially advanced countries of the West. Consequently, this section identifies five fundamental problems that the Ukrainian ferrous metals sector has been faced with under post-communism in the spheres of technology, market access and development, resources, and ownership transformation. It is contended that the relatively poor growth, efficiency, and stability outcomes generated by the Ukrainian steel industry after the collapse of state socialism ought to be attributed to these five central transformation-related variables.

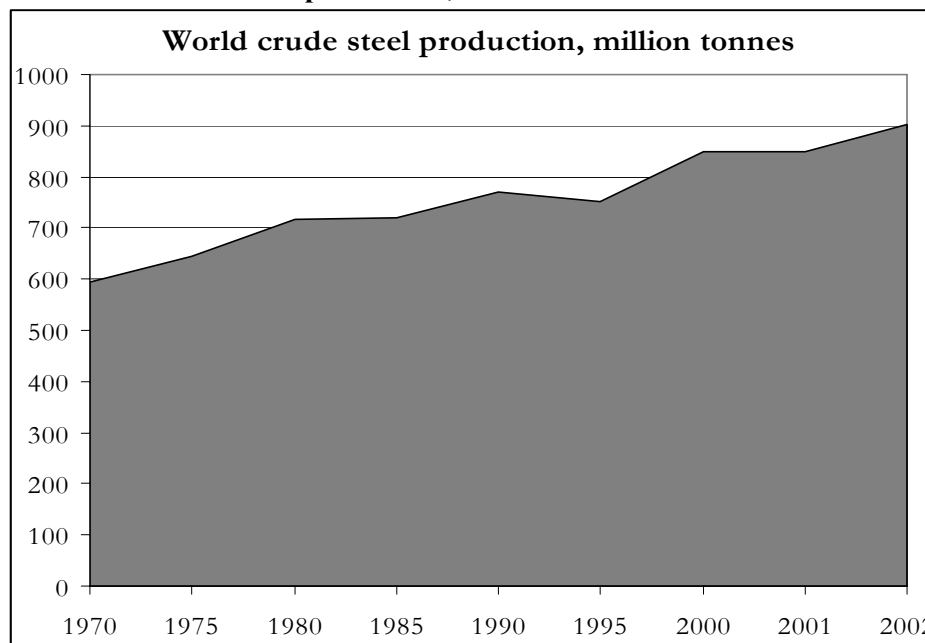
A DECLINING INDUSTRY?

In the 1970s, the major industrially advanced countries began to experience the phenomenon of 'de-industrialisation', which was identified with the contraction of output or employment in the industrial sector as a whole, and with a steadily falling share of manufacturing in the total workforce and production. As Ajit Singh and other scholars have argued, in some cases, de-industrialization should be regarded simply as a normal response to changing technology and tastes and does not signify any structural disequilibrium in the economy as whole with malignant consequences (see Singh 1987). According to the conventional economic theory, an industry's decline and, ultimately, its disappearance are usually related to the following factors:

Industries can decline because their products have been replaced by new and better products, or industries can decline because what used to be most cheaply produced in country A is now most cheaply produced in country B and exported to country A. In the first case, the word processor replaces the typewriter. In the second case, steel production moves from the United States to Brazil and American needs are met with imports from Brazil (Thurow 1987).

Could one possibly claim that Ukraine's ferrous metals sector has become an ailing industry? From a theoretical perspective, the Ukrainian iron and steel industry can decline if it faces a new replacement product. Alternatively, the iron and steel production in the country can become too expensive to be sustained and, consequently, the industry would shift to another country. Concerning the replacement products, the arrival and industrial-scale expansion of advanced plastic and concrete materials, which, since the early 1960s, have been widely used in manufacturing and construction all over the world, have provided new competitive substitutes for steel. Nonetheless, as Figure 20 shows, the world steel production has actually increased since 1970 in absolute volume terms by over 50 per cent, from 595 million tonnes to 902 million tonnes respectively.

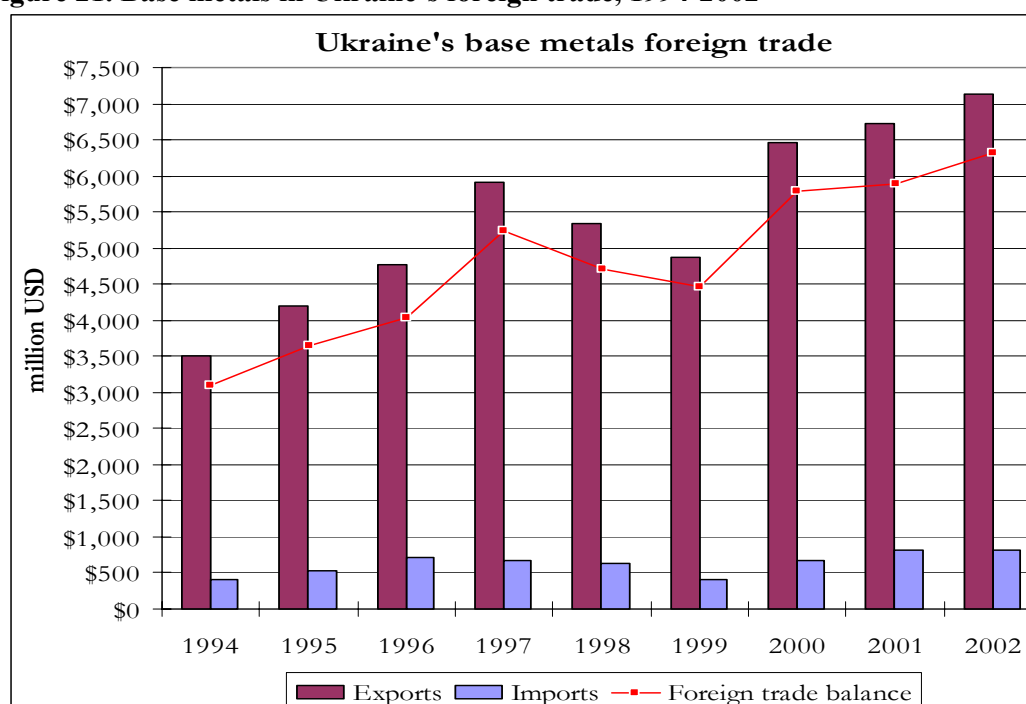
Figure 20. World crude steel production, 1970-2002



Source: International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

If one applies the industry shifting hypothesis, it would appear that Ukraine's ferrous metals sector can hardly qualify for a typical declining industry status. As it has been mentioned earlier, according to the commodity structure of Ukraine's foreign trade, ferrous metals comprise over 30 per cent of the country's total exports, whereas the imported steel products account for just over 2 per cent of Ukraine's total imports. Figure 21 indicates that the Ukrainian import of base metals has been very modest under post-communism, and that the country runs a huge foreign trade surplus with regard to ferrous and non-ferrous metals and metal products.

Figure 21. Base metals in Ukraine's foreign trade, 1994-2002



Source: Author's calculations on the basis of The International Bank for Reconstruction and Development, *Ukraine: Restoring Growth with Equity* (Washington, D.C: World Bank, 1999); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003).

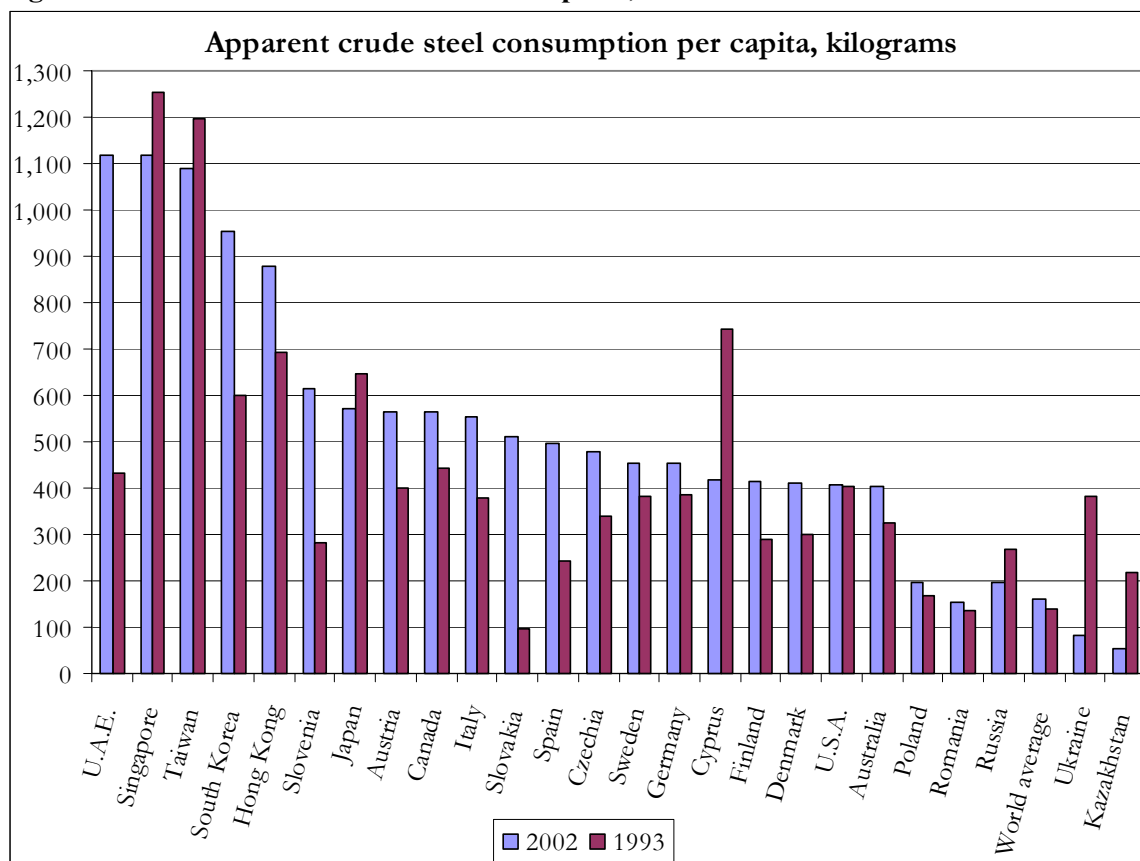
Moreover, while the Ukrainian steel companies export the overwhelming part of their produce (about 80 per cent), the domestic demand for crude steel as well as finished metal products seems to be sufficiently met by local producers. Thus, Ukraine's ferrous metals sector is not in the process of replacement by some competing steel producers from

overseas. What other factors can then account for growth, efficiency, and stability-related problems of the Ukrainian steel industry under post-communism?

DOMESTIC MARKET'S COLLAPSE

The collapse of the domestic market for Ukraine's ferrous metals is considered to be the major cause of the industry's crisis in the first half of the 1990s. Figure 22 compares the level of steel consumption across the globe. It shows the magnitude of the collapse of Ukraine's domestic steel consumption under post-communism: while in the early 1990s the Ukrainian domestic market for steel had been as large (on a per capita basis) as that of any industrially advanced economy of the West, by 2002, it contracted by 80 per cent. The current level of Ukraine's crude steel consumption is twice as low as the world's average.

Figure 22. International crude steel consumption, 1993-2002

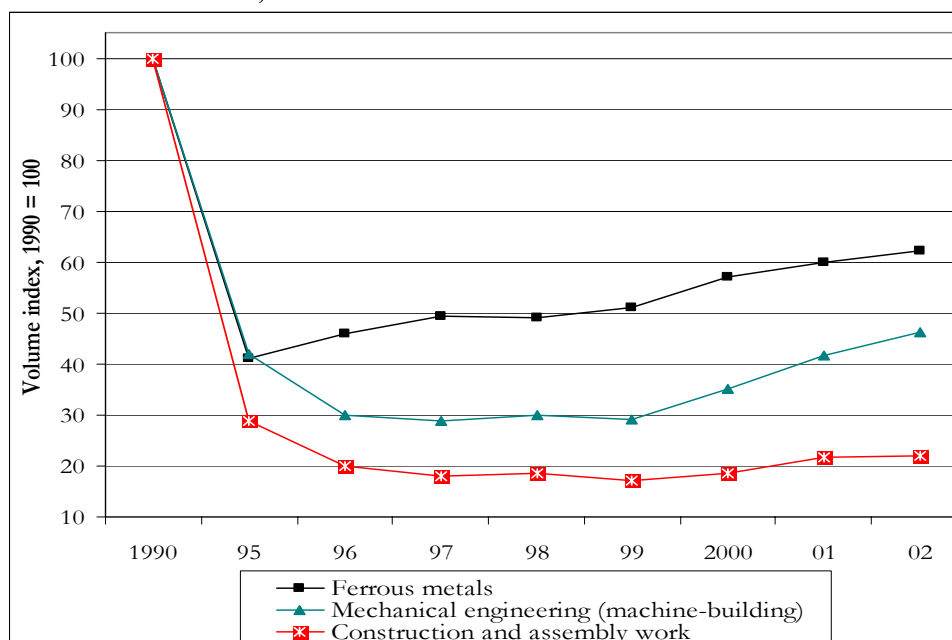


Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003);

International Iron and Steel Institute, Steel Statistical Yearbook 2003 (Brussels: IISI, 2004).

In the first half of the 1990s, the collapse of the Ukrainian steel industry was accompanied by a similar scale of output decline in heavy engineering (i.e. machine-building and military armaments) and construction – the two major domestic consumers of steel. Figure 23 demonstrates that in the second half of the 1990s, the Ukrainian steel-producing firms have found other (=overseas) market niches to compensate for the lack of locally-placed orders. The overall sales of ferrous metals produced in Ukraine have been growing since 1996, whilst the domestic industrial consumption remained stagnant until 2000. It is contended that, given the highly volatile nature of the world steel market, the underdevelopment of the domestic market for steel products in Ukraine should be regarded as one of the industry's long-term challenges.

Figure 23. The post-communist growth trajectory of Ukraine's steel, engineering, and construction sectors, 1990-2002



Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); National Bank of Ukraine, *Osnovni pokaznyky ekonomichnoho i sotsial'noho stanu Ukrainy 2001-2004 roky* (Kyiv: National Bank, 2004); Ukrainian State Statistics Committee, *Vyrobnytstvo ta tempy pryrostu obsiahiv promyslovoi produktsii: Operatyvni danni* (Kyiv: Derzhkomstat, 2004).

OVERSEAS MARKETS' RESTRICTIONS

The overseas steel market expansion notwithstanding, since 1992, the Ukrainian iron and steel industry has been faced with what a recent International Monetary Fund report describes as 'a plethora' of anti-dumping investigations and external market restrictions (2003). Export opportunities of the Ukrainian iron and steel producers have been badly damaged by a wave of anti-dumping sanctions, import tariffs, quantitative restrictions, and other protectionist measures imposed by the European Union, the United States, and a number of other steel-producing countries. Currently, 69 restrictive measures imposed between 1999 and 2002 against Ukrainian steel exports are in place. Table 4 summarises the most recent protectionist measures applied by a number of the World Trade Organisation member states.

Table 4. Anti-dumping duties imposed by WTO trading partners against Ukraine's ferrous metals in 2001-02

Product	Country of destination	Year of application	Measure
Flat non-coiled rolled metal	USA	2001	Duty - 90.33%
Reinforced steel	USA	2001	Duty - 41.69%
Flat non-coiled rolled metal	Canada	2001	Duty - 96%
Reinforced steel	Canada	2001	Duty - 15.7%
Steel wires and certain steel alloys	USA	2002	Anti-dumping margin - 116.37%
Ferrosilicium	India	2002	Difference between \$740 per tonne and cost of commodity
Pipe products	EU	2002	30.9% - 44.1%

Source: International Monetary Fund, 'Ukraine: Selected Issues', *IMF Country Report* No. 03/173 (June 2003), p. 51.

According to the IMF and WTO data, Ukraine has been ten times more likely to have anti-dumping measures imposed against it as the country's share in the international trade could suggest. Apart from the anti-dumping investigations, the IMF 2003 Ukraine report has pointed out a large number of other market access restraints have been imposed on the Ukrainian steel exporters:

For instance, over the January 1995 – June 2002 period, out of a total 1,161 anti-dumping measures, WTO member countries imposed 37 measures on Ukraine. The 3 percent share of measures imposed on Ukraine is disproportionate to the 0.3 percent Ukrainian share of world exports, but it is

partly explained by WTO members propensity to impose measures on metal trade (one-third of all measures) and the dominating role of metal products in Ukrainian exports (about 40 percent of total exports) ... Only 80 countries have had any anti-dumping measure imposed and relative to its importance in the world trading system, only Moldova has had more anti-dumping measures imposed than Ukraine. WTO trading partners that have imposed anti-dumping measures against Ukrainian exports include Canada (3 measures), Chile (2), Colombia (2), EU (8), India (4), Mexico (4), Turkey (2), U.S. (5), and Venezuela (2). [...] Apart from the imposition of antidumping duties, Ukrainian exports are also subject to quotas and licensing based on intergovernmental agreements. Agreements currently in place govern exports of various metal products to the EU, the U.S., Indonesia, and Russia. [...] The EU and the U.S. have both designated Russia and Kazakhstan as market economies, but Ukrainian efforts at receiving a similar designation has not met with success [...] In general, Ukraine has trouble penetrating world markets, because protection is relatively high in exactly the product lines where Ukraine has a comparative advantage (e.g., metals, grains, and other agricultural products). For instance, in addition to the ... new quota on grain imports, the EU ... has lowered the quota on ready-made rolled metals to 180,000 tons for 2003, from 355,000 tons in 2002. Furthermore, Ukraine is at a competitive disadvantage vis-à-vis Central and Eastern European countries that have received trade concessions from the EU not also granted to Ukraine. With the upcoming EU enlargement in 2004 this competitive disadvantage vis-à-vis prospective EU members in the current EU market will increase; at the same time, exports to prospective EU member countries may be negatively affected as these countries adopt the common EU tariff and other protection policies (*IMF Country Report: Ukraine. Selected Issues* No. 03/173, June 2003: 50-53).

TECHNOLOGICAL BACKWARDNESS

The third long-term challenge to the Ukrainian iron and steel industry under post-communism has been its obsolete production capacities and out-dated technology. The low levels of efficiency, productivity and profitability, which have characterised the Ukrainian iron and steel industry under post-communism, are due to the industry's technological backwardness and low value-added product assortment. Table 5 summarises technological characteristics of the major European, Asian, and American steel industries. It shows that the Ukrainian ferrous metals sector is currently the only industry in the world that still heavily relies on the open-hearth furnace production technology. Furthermore, Table 5 shows that the Ukrainian steel industry has been the slowest in the world in up-grading its production capacities towards more modern and efficient technological styles. By contrast, the world crude steel production has decisively moved towards oxygen-converter and electric furnace production technologies. Even the

world's least modernised steel industries of China, India, and Eastern Europe abandoned the open-hearth furnace production in the 1990s.

Table 5. Crude Steel Production by Process, 1990, 1995, 2002

		Open hearth furnaces %	Oxygen blown converters %	Electric furnaces %	Other %
Ukraine	1990	52.7	40.5	6.8	-
	1995	51.6	42.7	5.7	-
	2002	47.2	49.9	2.9	-
Poland	1990	29.1	52.9	18.0	-
	1995	12.8	64.7	22.5	-
	2002	0.1	69.3	30.6	-
Russia	1995	42.0	45.2	12.8	-
	2002	23.7	61.4	14.9	-
Czechia	1995	4.6	82.3	13.1	-
	2002	0.0	91.9	8.1	-
Kazakhstan	1995	12.4	85.2	2.3	-
	2002	0.0	100.0	0.0	-
Romania	1995	14.8	62.3	22.9	-
	2002	0.0	52.7	47.3	-
EU-15	1995	0.0	65.1	34.9	-
	2002	0.0	58.9	41.1	-
USA	1995	0.0	59.6	40.4	-
	2002	0.0	49.3	50.7	-
Japan	1995	0.0	67.7	32.3	-
	2002	0.0	72.9	27.1	-
China	1995	13.7	49.2	19.0	18.1
	2002	1.1	71.9	16.0	11.0
S.Korea	1995	0.0	62.2	37.8	-
	2002	0.0	54.8	45.2	-
Brazil	1995	1.3	81.1	17.6	-
	2002	0.0	79.8	20.2	-
India	1995	18.7	51.3	30.0	-
	2002	6.9	50.3	42.7	-
World	1995	7.3	57.5	32.6	2.6
	2002	3.8	60.0	33.9	2.2

Source: Ukrainian State Statistics Committee, *Statistical Yearbook of Ukraine 1999* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statistical Yearbook of Ukraine 2002* (Kyiv: Technical, 2003); Polish Central Statistical Office, *Statistical Yearbook of the Republic of Poland 2000* (Warsaw: GUS, 2001); International Iron and Steel Institute, *Steel Statistical Yearbook 2003* (Brussels: IISI, 2004); International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

Another cause of the poor profitability and efficiency of the Ukrainian steel industry is its specialisation in unfinished and semi-finished low value-added products. Table 6 provides the international crude steel output break-down by product in 2001 and 2002. It

shows that, besides Kazakhstan's ferrous metals sector, the Ukrainian steel industry is the only steel industry in the world, which has been overwhelmingly dominated by the production of ingots – the most elementary crude steel product. Furthermore, the Ukrainian steel producers have appeared to be the slowest in moving towards the production of other crude steel materials.

Table 6. Crude Steel Production by Product, 2001-02

	<i>Crude steel production by product, % of total production</i>						Total
	<i>Ingots</i>		<i>Continuously cast slabs and billets</i>		<i>Liquid steel for castings</i>		
	2001	2002	2001	2002	2001	2002	
Ukraine	78.6	78.5	19.8	19.9	1.6	1.6	100.0
Russia	45.8	42.6	50.9	54.3	3.3	3.1	100.0
Poland	39.7	21.7	59.0	71.7	1.2	1.2	100.0
Czechia	10.6	8.5	87.1	89.0	2.3	2.5	100.0
Kazakhstan	100.0	99.8	0.0	0.0	0.0	0.2	100.0
Romania	22.6	16.4	77.4	83.6	0.0	0.0	100.0
EU (15)	3.2	2.9	96.2	96.6	0.7	0.5	100.0
USA	3.1	2.8	96.9	97.2	0.0	0.0	100.0
Japan	2.1	1.9	97.5	97.8	0.4	0.3	100.0
China	9.3	7.0	89.9	92.5	0.8	0.6	100.0
S.Korea	1.2	1.1	98.5	98.6	0.3	0.3	100.0
Brazil	8.3	7.3	91.6	92.6	0.1	0.1	100.0
India	36.6	34.7	63.3	65.2	0.1	0.1	100.0
World	12.1	10.8	87.2	88.6	0.7	0.6	100.0

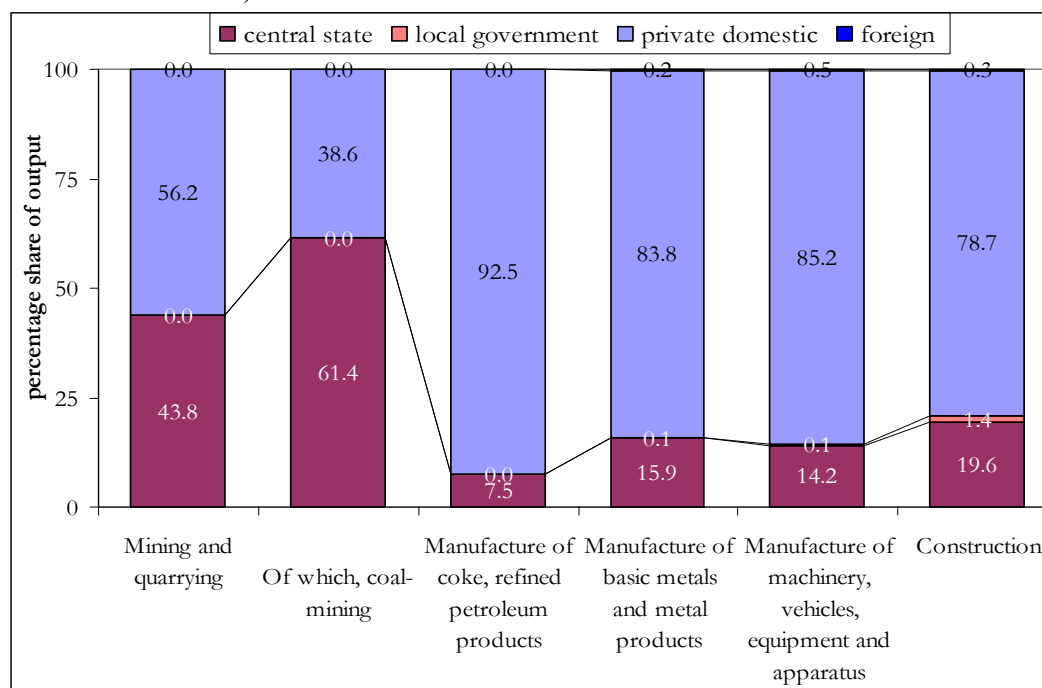
Source: International Iron and Steel Institute, *Steel Statistical Yearbook 2003* (Brussels: IISI, 2004); International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

FRAGMENTARY OWNERSHIP TRANSFORMATION

This paper recognises the collapse of Ukraine's local market for ferrous metals, which has forced the domestic steel producers to become fully dependent on volatile overseas markets, as well as the industry's technological backwardness, as the three fundamental long-term challenges that the Ukrainian steel sector has been faced with. It is contended, however, that the particularly unstable performance of the industry during the post-communist transformation has also originated from two other problems of a more short-term nature. The first more immediate problem of the Ukrainian ferrous metals sector is privatisation and the overall transformation of property and control arrangements across the entire national economy. By 2004, except for Kryvorizhstal – the largest steel

manufacturing and exporting enterprise – Ukraine’s all major ferrous metals companies have been privatised. However, the state has retained a certain degree of share-holding or management presence in the privatised steel companies. Furthermore, the Ukrainian steel producers have also had to cope with a fragmented property composition of their major suppliers and consumers. According to Figure 24, by the end of 2002, 84 per cent of Ukraine’s metals output was produced by the privatised steel companies. However, the bulk of Ukraine’s iron ore mines and the majority of coal mines have remained in the state ownership. On the other hand, the coal coking branch of the industry – the primary consumer of coal and the vital fuel supplier of the steel-producing enterprises – has been almost totally privatised.

Figure 24. The ownership structure of Ukraine’s metals sector and its major domestic customers, 31st December 2002



Source: Author’s calculations on the basis of Ukrainian State Statistics Committee, Statystychnyi shchorichnyk Ukrainy za 2002 rik (Kyiv: Technical, 2003).

The loss of management and co-ordination during the process of privatisation has had a detrimental effect on the economic performance of most of the Ukrainian steel works. A number of large iron and steel combines, iron ore mines and coal-coking plants have been partially privatised by or put under the private management control of simultaneously several competing Ukrainian industrial holding companies. The subsequent establishment of divergent property arrangements have created a number of major difficulties with

regard to the reliability of input and output provisions. Moreover, the fragmented ownership structure has propelled the huge principal-agent problem of resource allocation, which inevitably arises when property ownership and control are separated. The principal-agent problem has been exacerbated under post-communism through non-transparent commercial dealings between state-owned enterprises and private firms.

The constant process of consolidation has been one of the major characteristics of the world steel industry in the 1990s. As a result, a large number of steel companies in Western Europe, East Asia, and North America have either merged nationally (e.g. ThyssenKrupp) or turned into multinational enterprises through acquisitions and mergers accomplished abroad (e.g. the LNM Group, Arcelor, Corus). The fragmentary ownership transformation of the Ukrainian ferrous metals sector has become the main impediment to the industry's domestic consolidation. Table 7 shows that none of Ukraine's largest steel producers have been large enough to enter the league of the world's top 20 steel companies.

Table 7. The world's major steel-producing countries and companies, crude steel output, million tonnes, 2002

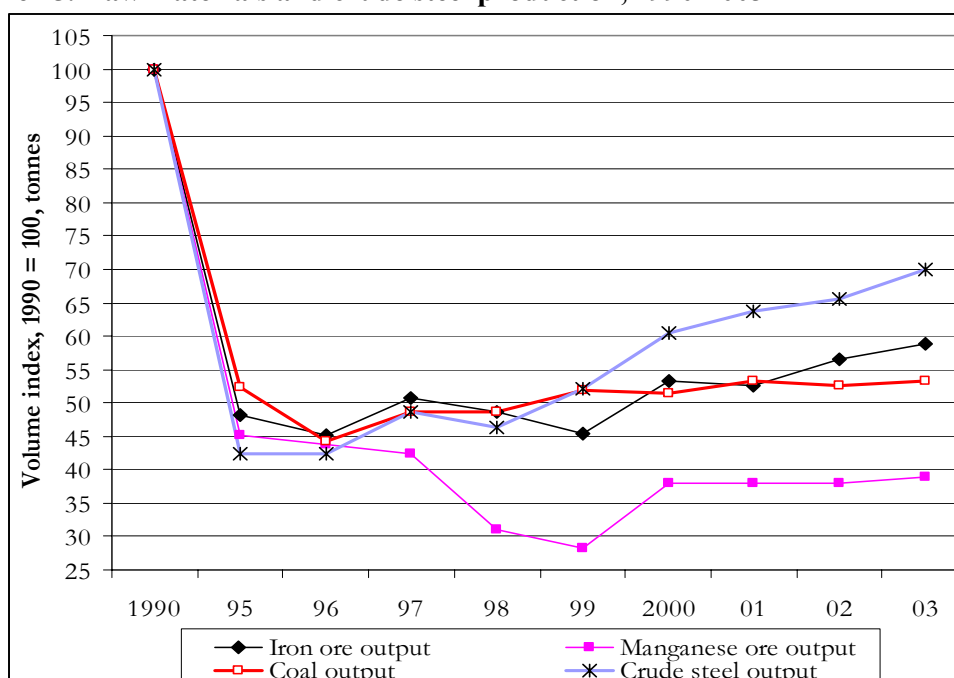
Rank	Tonnage	Country	Rank	Tonnage	Company
1	181.6	China	1	44.0	Arcelor
2	107.7	Japan	2	34.8	LNM Group
3	92.2	United States	3	29.8	Nippon Steel
4	59.8	Russia	4	28.1	POSCO
5	45.4	South Korea	5	19.5	Shanghai Baosteel
6	45.0	Germany	6	16.8	Corus
7	33.4	Ukraine	7	16.4	Thyssen Krupp
8	29.6	Brazil	8	15.2	NKK
9	28.8	India	9	15.0	Riva
10	26.1	Italy	10	14.4	U.S. Steel
11	20.3	France	11	13.7	Kawasaki
12	18.2	Taiwan	12	12.4	Nucor
13	16.5	Turkey	13	11.8	Sumitomo
14	16.4	Spain	14	11.5	Gerdau
15	16.0	Canada	...26	6.9	Kryvorizhstal
16	14.1	Mexico	...30	6.1	Mariupol Illich
17	11.7	United Kingdom	...45	4.7	Azovstal
18	11.3	Belgium	...55	3.9	Zaporizhstal
19	9.1	South Africa	...69	3.2	Alchevsk
20	8.4	Poland	...80	2.8	DniproPetrovsky

Source: International Iron and Steel Institute, *World Steel in Figures: 2003 Edition* (Brussels: IISI, 2003).

RESOURCE SHORTAGES

The shortage of raw materials and resource inputs has recently become the second short-term problem of the Ukrainian iron and steel industry. Figure 25 shows that since 1998, when the Ukrainian steel industry returned to the stable growth path, the output of iron and manganese ores and coal – the major raw materials used for the production of ferrous metals in Ukraine – has not been adequately recovering. The resource shortage problem, reportedly suffered by a large number of Ukraine's steel works, is exacerbated by the fact that an increasingly large share of domestically-produced iron ore and coke has been exported abroad, destabilising the local price levels.

Figure 25. Raw materials and crude steel production, 1990-2003



Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003); Ukrainian State Statistics Committee, *Vyrobnytstvo osnovnykh vydiv promyslovoi produkcii po misiatsiakh 2003 roku*; available at http://www.ukrstat.gov.ua/operativ/operativ2003/pr/ovp/ovp_u/arh_ovp.html.

Moreover, a large number of raw material-supplying enterprises (e.g. iron ore processing and concentrating factories, coal mines, coking plants) were privatised by very few owners, who have gained an almost monopoly market position in the resource base of the Ukrainian ferrous metals sector. For example, currently, the A.R.S. – a Donetsk-based company – reportedly controls about 90 per cent of Ukraine's coking coal-mining and

coke-producing enterprises and, thus, is able to exercise undue bargaining powers on the domestic market. The protracted privatisation of Ukraine's iron ore- and coal-mining industrial branches has only added to the generally uncertain and unstable supply of local raw materials.

CURRENT POLICY ENVIRONMENT

The election of Leonid Kuchma, a representative of Eastern Ukrainian industrialist circles, as Ukraine's President in July 1994 is considered to be the starting point for the creation of the current national industrial policy environment. From the very beginning, the transformation of Ukrainian heavy industries has appeared on the list of major priorities of the Kuchma administration. The central public policy document with regard to the Ukrainian iron and steel industry is 'The Conception of the Development of Ukraine's Mining and Metallurgical Complex until 2010' approved by the *Verkhovna Rada*^{††}, Ukraine's parliament, on 17 October 1995 (*Vidomosti Verkhovnoi Rady* No. 39, 1995). The Conception has emphasised the leading regulatory role of the state to be played in the process of essential industrial restructuring, privatisation, and adjustment of Ukraine's metals sector to the realities of post-communism and globalisation. This public policy document has also recognised the Ukrainian steel industry's problems in the spheres of production technology, product diversification, and international marketing, and provided for a number of activities aimed at the transformation of the Ukrainian metals sector into a more balanced, competitive, efficient, and environmentally conscious industry.

Nonetheless, the probability of the economic forecasting provided in the document and the level of understanding by the Conception's authors of the political economy of international trade have all proven to be inadequate. Table 8 confronts the real finished rolled steel output figures with the Concept's forecast. It shows that the Ukrainian steel industry has reached the 25 million tonne a year output level nine years earlier than previously forecasted. One should emphasise that the Conception's threshold of 25 million tonnes per year was calculated on the basis of existing raw material capacities. Thus, the current steel output expansion and the resultant shortages of raw materials have not been anticipated. The Conception has also underestimated the significance of the

^{††} Supreme Assembly

overseas market for the Ukrainian ferrous metals and, subsequently, totally neglected the potential threat of protectionist measures to be applied against the Ukrainian steel companies by a number of foreign governments.

Table 8. The production of finished rolled ferrous metals in Ukraine, forecast and real output figures, 1995-2010, million tonnes

	1995	2000	2001	2002	2005	2010
Forecast	18	20	n.d.	n.d.	22	25
Real output	16.6	22.6	25.4	26.4	n.a.	n.a.

Source: The forecast figures are taken from ‘The Conception of the Development of Ukraine’s Mining and Smelting Complex until 2010’, *Vidomosti Verkhovnoi Rady* No. 39, 1995. The real output data are from the Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukraïny za 2002 rik* (Kyiv: Technical, 2003).

The ‘Conception of the Development of Ukraine’s Mining and Metallurgical Complex’ has been followed by a number of legislative initiatives and executive orders concerning the operation and restructuring of the Ukrainian iron and steel industry. The Laws of Ukraine ‘On Economic Experiment at Enterprises of Ukraine’s Mining and Metallurgical Complex’ (valid from 14 August 1999 until 1 January 2002), and ‘On the Further Development of Ukraine’s Mining and Metallurgical Complex’ (valid from 1 January 2002 until 1 January 2003), provided the majority of domestic steel producers with a number of state assistance measures: (a) penalties and fines charged for untimely paid taxes, duties, and other mandatory payments were written off; (b) ferrous and non-ferrous metals enterprises were provided with tax allowances for fixed assets depreciation; (c) some share of the mandatory payment by metals companies of the ‘state innovation fund’ tax, the ‘enterprise profit’ tax, the ‘value-added’ tax, and the ‘environmental pollution’ duty were to remain at the respective companies and used directly for technology improvements and environmental safety measures; and (d) ferrous and non-ferrous metals companies covered by the two laws concerned were released from paying the ‘general usage motor-way maintenance’ duty (see *Vidomosti Verkhovnoi Rady* No. 38, 1999 and *Vidomosti Verkhovnoi Rady* No. 17, 2002).

Ukraine’s ferrous metals enterprises situated in the Donbas have also been affected by the Law of Ukraine ‘On Special Economic Zones and a Special Regime of Investment Activities in Donetsk oblast’, valid from 14 January 1999. This Law has established a special regime of investment activities within Donetsk oblast’s territories of priority development, which currently cover almost the entire provincial area. Subject to the

proposed investment of at least US\$ 1 million (US\$ 250,000 for small firms), a commercial entity which operates within the priority development territory is provided with a large number of tax breaks and allowances, customs duty and other incentives for the period of 30 years (see Table 9). The Donbas ferrous metals companies, as a result, have been able to make additional fixed capital investments within this special regulatory regime.

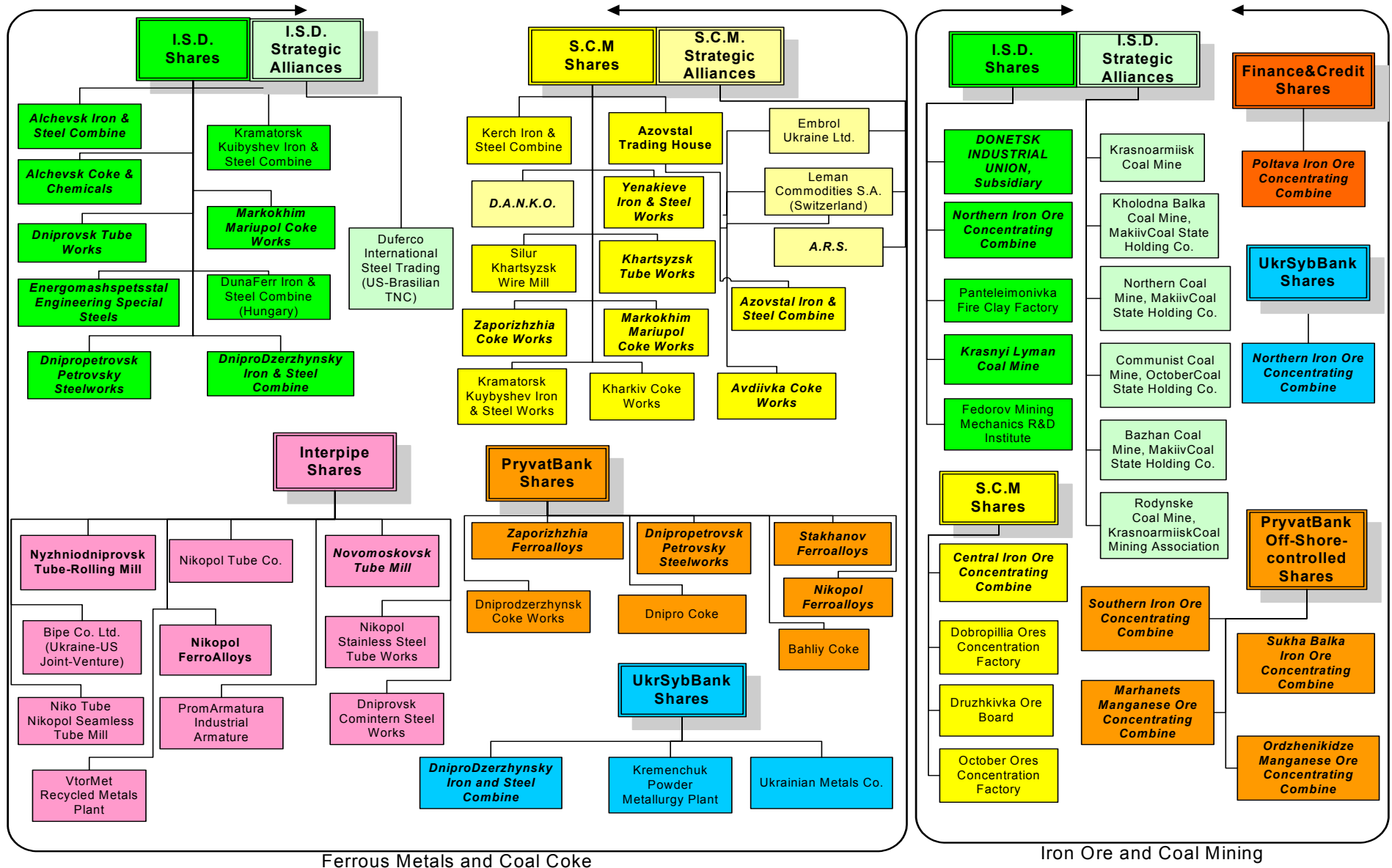
Table 9. Tax incentives provided in priority development territories, Donetsk oblast, 1999

Type of exemption	Priority Development Territory
Duration	30 years
Corporate income tax	0% rate for the first 3 years; 50% of the current tax rate afterwards*
Value-added tax	0% rate for the first 5 years
Non-resident personal income tax	2/3 of the current tax rate
Investor dividend tax	10% rate
Custom duties	0% rate for the first 5 years
Social insurance contributions	50% of the current rate
Minimum investment project	US\$ 1 million; US\$ 250,000 for small firms

Note: Provided profit is gained during the next 4 to 6 years

Source: Verkhovna Rada of Ukraine, 'The Law of Ukraine: On Special Economic Zones and a Special Regime of Investment Activities in Donetsk Oblast', available at <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi>.

Besides the legislative regulation of Ukraine's ferrous metals sector, another sphere of the state industrial policy has been focused on privatisation and the establishment of large domestic conglomerates, commonly referred to as 'financial and industrial groups'. By April 2004, except for the fully state-owned Kryvorizhstal Iron and Steel Combine, the Mariupol Illich Iron and Steel Combine (management-employee buy-out), and the *UkrRudProm* State Iron Ore Holding Company, all other ferrous metals enterprises in the country were either privatised or designated for privatisation by Ukraine's largest conglomerates such as: the Industrial Union of the Donbas (*ISD*; Donetsk-based); System Capital Management (*SCM*; Donetsk-based) and its affiliates (D.A.N.K.O. and A.R.S; both Donetsk-based); the Interpipe Group (*Interpipe*; Dnipropetrovsk-based); the Private Group (*PryvatBank*; Dnipropetrovsk-based); the Ukrainian-Siberian Bank Group (*UkrSybBank*; Kharkiv-based); the Finance & Credit Group (*Finansy i Kredyt*; Kyiv-based). Figure 26 shows the extent of involvement of Ukraine's largest conglomerates in the ferrous metals sector, ranging from coal mines and iron ore deposits to special steel alloys and international marketing.



Ferrous Metals and Coal Coke

Iron Ore and Coal Mining

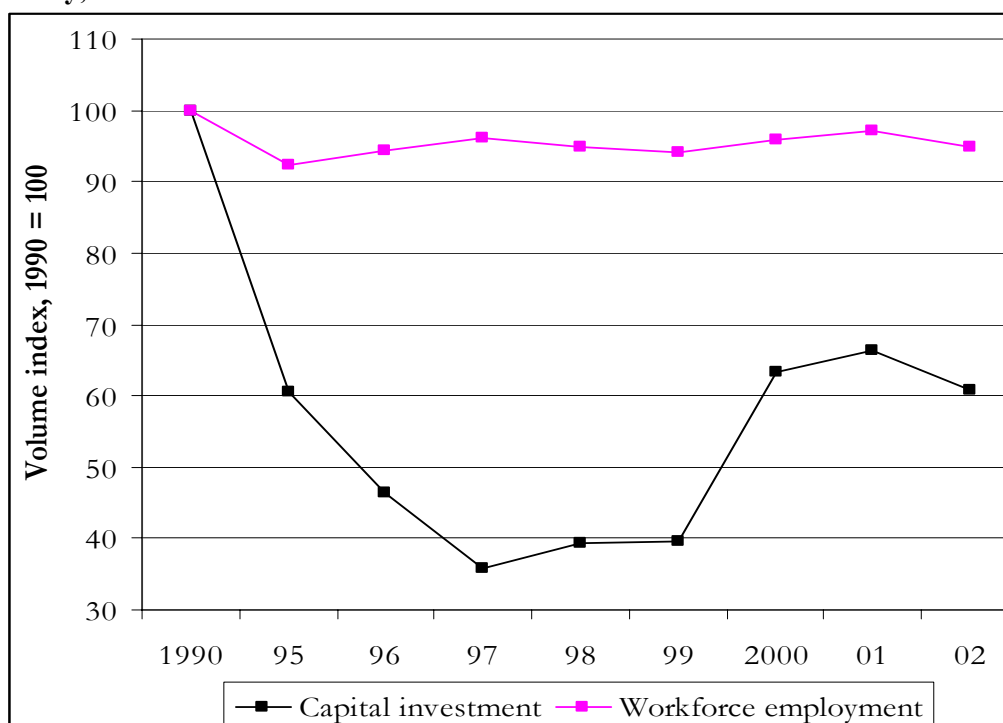
Figure 26. The Ukrainian financial & industrial groups' interests in the ferrous metals sector

Note: Data in italics indicate that the firm belongs to the list of top 100 largest companies of Ukraine or to the respective sectoral list of largest companies.
 Source: Author's construction of the basis of *The Korrespondent Kyiv Post Weekly*, 10 January 2003; *Dannye o korporatsii* (Donetsk: ISD, 2004); Ukrainian Investment Gazette, *Top 100: Reiting luchshykh kompanii Ukrainy* (Kyiv: Ukrainskaia Investitsionnaia Gazeta, June 2003), and various periodical publications.

ASSESSING THE CURRENT PUBLIC POLICY OUTCOMES

There have been a number of positive developments generated by the recent policy reforms and newly-established state assistance mechanisms. The Ukrainian steel industry experiment and the regional policy investment incentives have led to a substantial increase in fixed capital investment into the ferrous metals sector. Figure 27 shows that since the late 1990s, the amount of steel capital investment has been growing. Moreover, the Ukrainian steel companies have also been engaged in some labour restructuring. The total workforce employed by the Ukrainian ferrous metals industry has declined from 447,000 in 1990 to 423,000 in 2002.

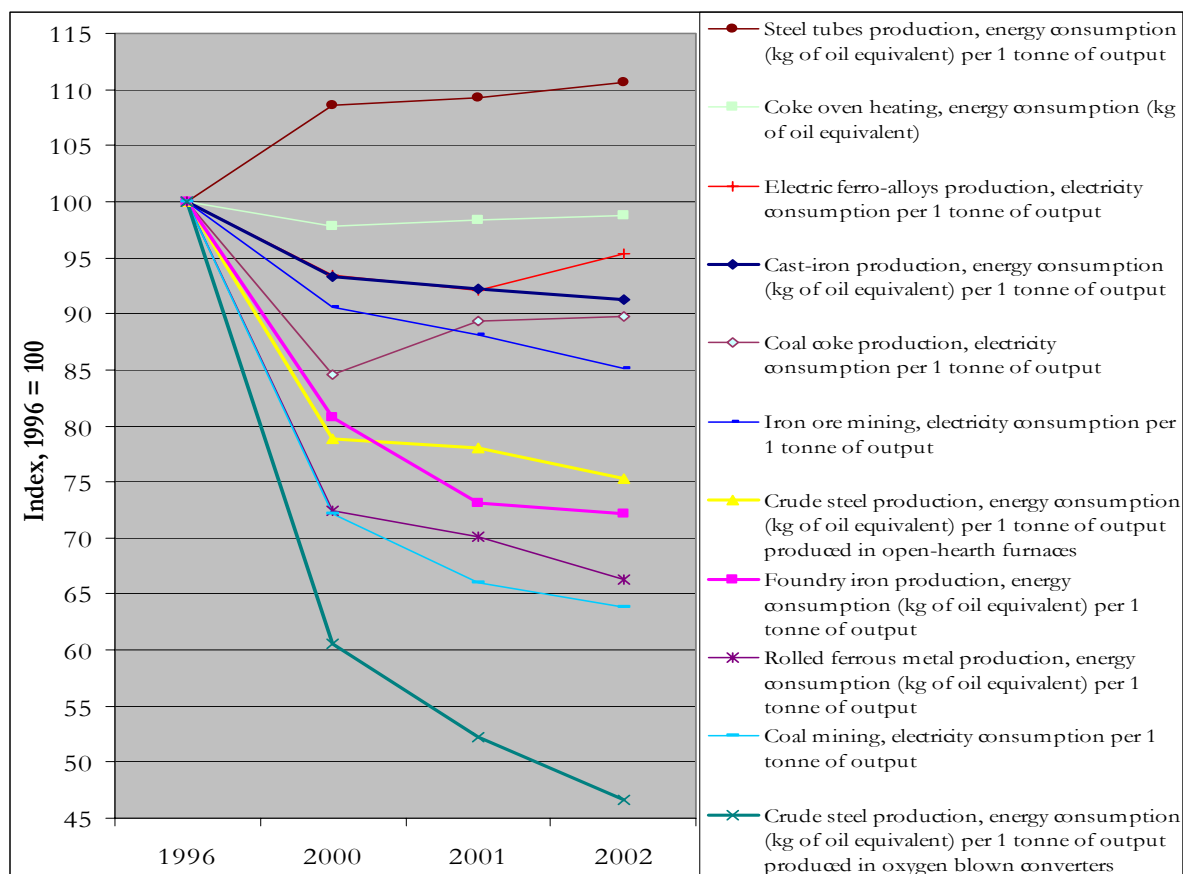
Figure 27. Capital investment and labour employment in the Ukrainian steel industry, 1990-2002



Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Technical, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Technical, 2003).

Moreover, certain modernisation of production capacities undertaken by a number of Ukrainian steel companies in the course of the sectoral experiment has resulted in substantial efficiency gains. Figure 28 shows that energy and fuel consumption levels have been considerably reduced in all but one technological process within the ferrous metals production cycle.

Figure 28. Energy efficiency developments in Ukraine's ferrous metals sector, 1996-2002



Source: Author's calculations on the basis of Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 1999 rik* (Kyiv: Tekhnika, 2000); Ukrainian State Statistics Committee, *Statystychnyi shchorichnyk Ukrainy za 2002 rik* (Kyiv: Tekhnika, 2003).

Nonetheless, the current public policy instruments have not provided an effective response to the drastic collapse of the domestic market for Ukrainian ferrous metals. As Figure 23 (page 37) has shown, the recovery of Ukraine's heavy engineering and construction has been lagging far behind the domestic steel output growth. Furthermore, the Ukrainian government has not been able to adequately address the detrimental effects emanating from the disproportionate discrimination of the country's steel producers overseas. The Ukrainian government has failed so far to secure its membership in the World Trade Organisation or, at least, to negotiate successfully granting of the market economy status for the country. The Ukrainian authorities have been addressing the problem of the fragmentary ownership transformation of the industrial sector by

facilitating the establishment of large national conglomerates based on ferrous metals. While this strategy has provided a certain incentive for the industry's consolidation and overall management improvement, it has also led to a number of privatisation conflicts between different conglomerates around particular steel works and other ferrous metals enterprises. Figure 26 above shows that a large number of steel works, mines, and factories are owned and/or controlled by at least two different holding companies. Reportedly, such situations have not been beneficial for the output stability and production efficiency of the Ukrainian ferrous metals industry per se. Ukraine's current public policies vis-à-vis the domestic steel industry have also failed to adequately address the problem of raw material shortages suffered by a number of largest steel companies. The acuteness of the resource shortage problem has not been anticipated, while the monopolisation of the industry's resource base has not been properly tackled.

CONCLUSION

This paper has overviewed the Ukrainian ferrous metals sector – the industrial branch of an overwhelming importance for the national economy. It has shown that the Ukrainian iron and steel industry entered the period of the post-communist transformation as a fully-grown and densely-located manufacturing sector. This paper has also examined the economic outcomes generated by the Ukrainian iron and steel industry in the course of the post-communist transformation. It has argued that one of the main outcomes of Ukraine's post-communist transition has been a massive, sharp, deep, and long decline in the ferrous metals output. The Ukrainian iron and steel industry in transition has also been characterised by deteriorating efficiency, falling labour productivity, low returns on investment, and mediocre profits. On the whole, in the 1990s, the Ukrainian ferrous metals sector has gone through an extremely unstable economic period. The remarkable export expansion has been undertaken by the Ukrainian steel companies under highly volatile conditions of the international steel markets.

The recovery of the ferrous metals industry has preceded the overall revival of Ukraine's industrial sector by at least two years. Since the end of 1998, the Ukrainian iron and steel industry has followed a generally upward growth path. Nonetheless, whilst the delayed revival of the Ukrainian manufacturing sector has been almost linear, by contrast, the

steel industry has been growing in a rather haphazard way. The export sales revenues and profit earnings reported by the Ukrainian ferrous metals companies have also been erratic. Moreover, while a small number of Ukraine's steel works have recently taken the leading market positions, the majority of the ferrous metals companies are clearly lagging far behind, while some enterprises have apparently been reduced to rubble.

This paper has analysed a number of causes of the unusually poor performance of Ukraine's ferrous metals sector. It has discovered five major challenges the industry has been faced with since the beginning of the 1990s. It has been contended that the collapse of Ukraine's domestic steel market and the industry's resultant dependence upon the volatile markets overseas constitute the first two fundamental long-term challenges to the sustainability of the Ukrainian ferrous metals industry. The industry's obsolete production technology and its undeveloped steel product assortment have been identified as the third long-term developmental challenge. This paper has also recognised Ukraine's protracted privatisation process, which has produced a fragmentary ownership structure, as well as the growing shortage of raw materials within the ferrous metals sector, as the industry's two core short-term problems. It has been argued further that, apart from the technological gap challenge, the current public policy environment has not provided an adequate response to the industry's transformation challenges.

REFERENCE LIST

- Bannock, Graham, Baxter, R.E., and Evan, Davis. (1992). *The Penguin Dictionary of Economics*, 5th edn. London: Penguin Books
- Bornstein, Morris, ed. (1985). *Comparative Economic Systems: Models and Cases*, 5th edn. Homewood, Illinois: Richard D. Irwin
- Chumachenko, N.G. (1977). *Ekonomika promyshlennosti Donbassa, 1945-1975*. Kyiv: Naukova dumka
- Elliott, John E. (1973). *Comparative Economic System*. Englewood Cliffs, New Jersey: Prentice-Hall
- Gardner, H. Stephen. (1998). *Comparative Economic Systems*, 2nd edn. Fort Worth, Texas: Dryden Press
- Gregory, Paul R., and Stuart, Robert C. (1999). *Comparative Economic Systems*, 6th edn. Boston: Houghton Mifflin
- International Iron and Steel Institute. (2003). *World Steel in Figures: 2003 Edition*. Brussels: IISI
- International Monetary Fund. (2003). 'Ukraine: Selected Issues', *IMF Country Report* No. 03/173 (June)
- Petryha, M.O. (1998). 'Rozmishchennia haluzei metalurgiinoho kompleksu', in Ye.P. Kachan, ed., *Rozmishchennia produktyvnykh syl Ukrainy*. Kyiv: Vyscha shkola, pp. 126-39
- Singh, Ajit. (1987). 'Manufacturing and de-industrialization', in John Eatwell, Murray Milgate, and Peter Newman, eds., *The New Palgrave: A Dictionary of Economics*, in 4 vols. Vol. 3. London: Macmillan Press, pp. 301-08
- The Organisation for Economic Co-operation and Development. (2001). *Developments in Steel-making Capacity of Non-OECD Countries*. Paris: OECD
- Thurow, Lester C. (1987). 'Declining industries', in John Eatwell, Murray Milgate, and Peter Newman, eds., *The New Palgrave: A Dictionary of Economics*, in 4 vols. Vol. 1. London: Macmillan Press, pp. 756-58
- Ukrainian State Statistics Committee. (2003) *Statystychnyi shchorichnyk Ukrainy za 2002 rik*. Kyiv: Technika
- Zastavnyi, F.D. (1990). *Heohrafiia Ukraïny*. L'viv: Svit.
- Zimbalist, Andrew, ed. (1984). *Comparative Economic Systems: An Assessment of Knowledge, Theory and Method*. Boston: Kluwer-Nijhoff Publishing