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Trade Liberalisation and Employment Effects in Ukraine

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Abstract

Relating trade openness indices at the industry level to industry-specific job flow measures, we try to establish a causal effect of trade liberalisation on employment adjustment in Ukrainian industry for the period 1993-2000. We calculate these indices for trade flows of three complementary trading areas, the EU, the CIS and the rest of the world. We find that idiosyncratic factors seem to explain most of the variation of employment adjustment in Ukrainian industry. However, GMM regression results suggest that trade liberalisation does affect job flows. More trade with the EU raises job creation and excess job reallocation, while industries that engage more with the rest of the world show larger job destruction rates. Finally, sectors that are more open in their trade in the CIS trading area have smaller job destruction rates and positive net employment growth.

JEL Classification Numbers: E24, F14, J63, P23.

Key Words: Job Creation; Job Destruction; Ukraine; Trade Flows

I. Introduction

The flexibility of labour markets is an important feature of well-functioning market economies. Davis and Haltiwanger (1999, 1992) and Baldwin, Dunne and Haltiwanger (1998) report that in the U.S. and in Canada roughly one in every ten jobs is created and one in every ten jobs is destroyed each year. Flexibility of the labour market is important because it permits the rapid reallocation of resources to the most efficient uses and thus it may be vital for economic growth. Labour reallocation is to a large extent driven by job creation and job destruction. Businesses react continuously to shocks by changing output and input levels at a high pace leading to substantial destruction and creation of jobs at high frequencies. Job creation and job destruction are thus intimately linked to productivity growth. Firms (sectors) that engage in restructuring destroy low productivity jobs and create high productivity ones, leading to large job turnover, an increase in labour productivity and better general performance.

A high degree of job reallocation, while beneficial for an economy as a whole, can, however, have large negative effects for those unfortunate workers who are displaced from their jobs. There is ample evidence, in particular from Anglo-Saxon labour markets, that the average displaced worker faces prolonged non-employment spells and long-term earnings losses (see e.g. Kuhn (2002) and Jacobson, Lalonde and Sullivan (1993a, 1993b)).

Labour reallocation, brought on by the reallocation of jobs across firms and sectors, is an especially pertinent issue in transition economies. The reallocation of labour from inefficient firms (usually non-restructured state and privatised firms) to efficient ones (usually new private and restructured state and privatised firms)

increases overall labour productivity and enhances efficiency during the transition from plan to market (Blanchard (1997)). How job creation and destruction have contributed to this reallocation process across businesses and sectors has been the subject of a growing literature on job gross flows in Central Europe and the CIS, which is summarised in Haltiwanger, Lehmann and Terrell (2003). Like in mature capitalist economies, the welfare gains generated by the ongoing process of labour reallocation are, however, not distributed evenly. Many low-skilled and older workers who are displaced from their jobs incur large costs above all in the form of long spells of non-employment, as Lehmann, Philips and Wadsworth (2002) have shown for Estonia where data on displacement are readily available.

Beneficial and detrimental outcomes of labour reallocation induced by changing trade patterns have been widely discussed in the literature on the impact of globalisation on Western domestic labour markets. However, there are only a few papers that look at how trade affects job creation and job destruction directly. While Klein, Schuh and Triest (2003) estimate the effects of real exchange rates on job creation and job destruction for the US manufacturing industry, Lewinsohn (1999) investigates the influence of trade liberalisation on job creation and destruction in Chile.

With respect to the impact of shifting trade patterns on domestic labour markets, transition economies provide something of a quasi-natural experiment. Under central planning the state had a foreign trade monopoly, so firms were in principle not acting autonomously in export markets. At the same time, enterprises were sheltered from import competition. So firms in most centrally planned economies were completely

isolated from world markets.[1] With the start of transition trade was liberalised, abolishing the foreign trade state monopoly. As a consequence of trade liberalisation, we see a strong re-orientation of trade away from the defunct CMEA trade area to Western markets, in particular to the EU. In addition, trade liberalisation implies that many firms engage autonomously in fast growing Western export markets. The same firms or other firms have to deal themselves with import competition. Firms' engagement in export markets and the abrupt exposure to import competition imply that some sectors of industry in transition countries open up to the world economy over a short time horizon at a very rapid pace. Industrial sectors in mature capitalist economies have opened up much more gradually over the eighties and nineties, making it difficult to isolate the effect of changing trade patterns on employment adjustment in domestic labour markets.

We try to take advantage of the rapid opening up of one transition country, Ukraine. As we shall show in the next section, Ukrainian trade flows to and from areas outside the Commonwealth of Independent States (CIS) have increased dramatically over the nineties. We exploit this dramatic increase and investigate whether and how trade liberalisation causally affects job creation and construction of three-digit industrial sectors. Alternatively, we could analyse the causal effect of trade liberalization on net changes in employment by estimating labour demand equations at the sectoral level. However, as suggested by e.g. Gourinchas (1999), linking trade shocks with gross job flows might provide a more complete picture of how labour markets adjust to such shocks.

[1] In Poland and Hungary, economic reforms of the central planning system gave some autonomy to state-owned enterprises in the eighties. Some of the Hungarian and Polish enterprises did have trade relationships with Western firms already in the eighties as a consequence of these reforms (see e.g. Repkine and Walsh (1999) who study Polish enterprises). In the Soviet Union, on the other hand, where the Classical Planning System was rather unaffected by economic reform throughout the

The sectoral gross job flows in our paper are based on establishment-level data from the Ukrainian registry data for the years 1993-2000. In an earlier study, two of us used Ukrainian establishment level data from the Amadeus data base to look at the impact of trade liberalisation on job gross flows at the establishment level in the late nineties (Konings, Kupets and Lehmann (2003)). The present paper is complementary insofar as it extends the analysis to the sectoral level and augments the time dimension to nearly the entire last decade. With data that have a substantial time series dimension we hope to better control for cyclical and idiosyncratic shocks. Using an GMM estimator we might be able to better isolate the effect of trade liberalisation on job gross flows.

The following section gives a short account of the developments of the industrial sector in Ukraine over the nineties and looks at the evolution of trade flows over the same period. In the subsequent section we describe our data sources, briefly review the job flow measures that we employ in the analysis and sketch the construction of indices of trade openness at the sector level. This is followed by a discussion of some descriptive results with regard to job flows and of the raw correlations of the trends of job flows and of trade orientation of sectors. Section four develops the estimation framework and reports results from GMM estimations. The final section offers some conclusions.

II. Ukrainian Industry and trade in the nineties

Reform efforts to transform the Ukrainian economy have been either non-existent or very inconsistent since Ukraine gained its independence in December 1991. The capture of the state by a few oligarchic groups, the exclusion of the majority of the

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Communist regime, the foreign trade monopoly of the state was not touched until the implosion of the

population from the decision making process and weak property rights resulted in stagnancy, corruption and a collapse in output for most of the decade (Aslund (2002). In the first half of the nineties runaway inflation, resulting for a prolonged period in hyperinflation, was one of the manifestations of the poor economic policies that brought Ukraine on the brink of collapse. Only towards the end of the nineties were serious reforms undertaken that loosened the grip of the oligarchs and that spurned robust growth for the first time since the collapse of the Soviet Union.

Figure 1, which shows the trends of production and employment, makes the point quite forcefully that the nineties were a lost decade for Ukraine. After a extremely sharp contraction of industrial output in 1993 (the year of the hyperinflation) we see a five year trough until there is some growth in 1999 and 2000. By the end of the decade industrial output had "recovered" to only about 60% of the pre-transition level, which points to a dismal performance in comparison with all those European transition countries that have not been affected by armed conflict.

It is also striking that employment shows a steady decline hinting at substantial labour shedding throughout the period. This labour shedding was driven by large job destruction as Table 1 makes clear. Throughout the decade we see job destruction rates at levels that are observed in Western economies with rather flexible labour markets (Davis and Haltiwanger (1999)), while job creation rates are small in international perspective. What is interesting, though, is that job creation does take place at all during this period and that it does gather pace in 1999 and 2000 when industrial output grows. Despite the enormous fall in industrial output and the cumulative employment contraction of roughly 40%, jobs are continuously

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centrally planned economy.

reallocated at an increasing pace as the secular rise of the excess job reallocation demonstrates.

How much trade contributes to this reallocation is the focus of the paper. Even a cursory look at Ukrainian trade flows (Figures 2 and 3) gives two striking facts. First, the above-mentioned re-orientation from CIS to Western economies that one generally observes for transition countries is clearly given for Ukrainian trade. Both exports and imports are re-directed away from the CIS to the EU and the rest of the world (ROW-all those areas that are outside the EU and CIS). Second, we see a spectacular rise of EU and ROW trade flows throughout the decade, while CIS trade flows decline in the second half of the nineties. This large increase in trade flows will be exploited by us in the analysis that follows.

It is, however, not only the large trade reorientation from the CIS area to the other areas of the world that lets us look at trade flows from and to the CIS separately. Since CIS trade flows were intra-country trade flows before the break-up of the Soviet Union, i.e. trade flows between state-owned enterprises, the substantial secular rise in CIS trade in the *early* years of transition that we observe in Figures 2 and 3 might well be linked to the attenuation of the "disorganisation" of supply chains mooted by some authors as the principle cause of the initial and often prolonged collapse of production in early transition (Blanchard and Kremer (1997) and Konings and Walsh (1999)). In other words, the rise in CIS trade flows could be connected with the reestablishment of trade links between enterprises that were severed by the collapse of the Soviet Union and the CMEA trade arrangements. Separating CIS trade flows out will prevent the confounding of the attenuation of "disorganisation" and genuine trade liberalisation.

III. Data, the construction of openness indices and of job flow measures and some descriptive results

The empirical analysis is based on industry-level data for a panel of 95 three-digit NACE mining and manufacturing industries in Ukraine over the 1994-2000 period, containing information from 3 diverse sources. The panel is restricted to the subset of Ukrainian industries for which data on job and trade flows are available over the whole period.

Annual sectoral data on job creation, destruction and reallocation are constructed from the establishment-level registry data set from 1993 to 2000 provided by the State Statistical Committee of Ukraine ("Derzhkomstat")[2]. Although the initial registry data also cover establishments from some non-industrial sectors (4.84% of the initial sample), we restrict our analysis of job flows to firms in mining, manufacturing industries and electricity, gas and water supply (i.e. to 3-digit NACE sectors from 101 to 410)[3]. The manufacturing sample covers about 80% of officially reported total industrial employment. The data set that we use in the analysis comprises only firms that we can identify with certainty as continuing firms, i.e. firms that have positive employment at least for the two adjacent years. Information on ownership is based on the ownership codes of the enterprises in the registries and is available only for 2000[4]. Annual data on import and export flows come from the Ukrainian Customs Office data on import and export volumes in US dollars by countries of origin and

[2] Since the Derzkkomstat used the old classification of industries OKONKh (Classification of branches of national economy) till 2001 we converted 5-digit OKONKh industries to the 3-digit NACE sectors for our further analysis at the sectoral level.

[3] We also eliminated sectors 205 (Manufacture of other products of wood), 233 (Processing of nuclear fuel) and 372 (Recycling of non-metal waste) because of insufficient number of observations for sectoral analysis. All prison-based enterprises (about 170 establishments) were excluded from the sample.

[4] For the moment, we can distinguish only between state and non-state (including collective, private and foreign) ownership

destination disaggregated by the six-digit commodity groups according to the Harmonised Commodity Description and Coding System (HS)[5].

Since we attempt to compare and contrast the role played by trade with the EU countries from that of trade with the CIS countries in altering employment in Ukrainian manufacturing, we focus our analysis on the data set consisting of export and import volumes in three trading areas: CIS countries, EU countries and the rest of the world (ROW). Following Klein, Schuh and Triest (2003a) we construct three different industry-specific indices of openness as ratios of trade flows relative to these trade flows and production. The formulas for the three trading areas are given in Appendix 1. Figure 4 depicts the percentile distribution of these indices over the sample period. What is evident is the large increase in trade openness over a relatively short period of time in many Ukrainian industrial sectors. The median (50^{th} percentile) value of the index rises from almost 1 percent in the beginning of the period to more than 20 percent at the end of 2000. It is also striking that a large number of closed sectors stayed closed over the same years, as shown by 10^{th} and 25^{th} percentile of the distribution. Panel B, in addition, shows that this increase occurred differently and more unevenly in trade orientation towards CIS countries.

The term trade liberalisation is often associated with trade policies fostering closer and less distorted ties of an economy with world markets (see e.g. Edwards (1993)). Here, we understand trade liberalisation, which is in this paper perceived as industry-specific, as the opening up of Ukrainian industries to the world economy as expressed by the calculated openness indices.[6]

[5] HS codes were also converted to the 3-digit NACE sectors. In our study we exclude sectors 296 (Manufacture of weapons and ammunition) and 362 (Manufacture of jewellery) because of non-availability of trade flows data for the whole interval from 1993 to 2000, and then we base our analysis only on sectors used in the manufacturing sample of the Derzhkomstat data set

[6] A detailed picture of Ukrainian trade policy changes are presented in Appendix 2.

Turning now to the job flow measures used, we follow Davis and Haltiwanger (1992, 1999) by defining gross job creation (pos) as the sum of all employment gains in all expanding firms, while gross job destruction (neg) is the sum of all employment losses in all contracting firms in an economy or sector. Usually gross job destruction is expressed as a positive number. These gross job flows can be expressed as rates by dividing them by the total amount of jobs available in an economy or sector. The sum of the gross job creation rate and the gross job destruction rate is the gross job reallocation rate (*gross*), while the difference is the net aggregate employment growth rate (*net*) that can be observed in aggregate statistics. A measure of churning or reallocation of jobs which is over and above the amount of job reallocation necessary to accommodate a given net aggregate employment growth rate is the excess job reallocation rate (*excess*) and is defined as the gross job reallocation rate minus the modulus of the net aggregate employment growth rate. We interpret *excess* as a measure of genuine labour reallocation within a sector.

Throughout the sample period job destruction dominates in Ukrainian industry as Tables 2 –4 clearly demonstrate. In the first five years of our sample period three quarters of establishments destroy more jobs than they create as seen in the first five rows of Table 2. Only in the years 1999 and 2000 do we see small positive net employment growth at the 75 percentile. In addition, the variation in the employment growth rate jumps in these last two years indicating an increased heterogeneity of labour adjustment by Ukrainian industrial establishments. The predominance of job destruction can also be seen from the fact that the distribution of the sectoral job creation rates is far to the left of the distribution of the sectoral job destruction rates (Tables 3 and 4). The most important fact transpiring from these tables is, however,

the tremendous heterogeneity in job creation and job destruction behaviour of Ukrainian industries in this period.

The raw correlations of trade openness and job gross flows shown in Figure 5 demonstrate one clear cut result: For all three trading areas job destruction is substantially higher in the upper 25% of the distribution compared to the lowest quartile. On the other hand, neither for job creation nor excess job reallocation a clear pattern emerges.

IV. Theoretical Framework, Empirical Specification and Results

There is little theoretical and empirical work relating gross job flows and international trade (Klein, Schuh and Triest 2003a,b). In addition, Haltiwanger, et. al. (1996) establish "no systematic relationship" between job flows and openness to trade in US manufacturing for 1973 to 1986. To study the employment effects of exposure to international trade in Ukrainian industrial sectors, we closely follow Klein, et al. (2003a) who study the costly adjustment to trade flows using detailed data on US manufacturing for the period 1973-1993. We specify job flows as a function of trade flows that vary systematically by industry and control for other industry-specific effects (including privatisation) and explicitly model dynamic adjustment of labour reallocation in sectors by including lagged dependent variables. Earlier work has shown that adjustment costs in transition tend to differ in non-trivial ways according to industry and ownership. We expect that opening of essentially closed (former CMEA) markets to international trade will affect different industries disproportionately.

Thus, we study the effects of trade liberalization on job creation, destruction, and labour reallocation by analysing differences in international exposure of industrial sectors in Ukraine controlling for idiosyncratic shocks and ownership structure at the end of period. We construct three different measures of trade openness towards three different groups of countries (EU, CIS (former Soviet Union countries) and the rest of the world (ROW)). In addition, we interact these indexes with a trade weighted (multilateral) real exchange rate to isolate the effects of relative prices and productivity differences according to industrial sectors at 3-digit level. See Appendix 1 for definition of these and other variables used in our estimation.

We estimate these specifications using generalized method of moments (GMM) estimator to account for potential endogeneity problems. The resulting general specification is[7]:

$$JF_{it} = \alpha_0 + \alpha_1 JC_{it-1} + \alpha_2 JD_{it-1} + \alpha_3 OI_{it} + \alpha_4 OI_{it-1} + \alpha_5 E_{it} + \alpha_6 E_{it-1} + \alpha'_7 D_i + \varepsilon_{it} \qquad (1)$$

This equation is motivated by the model presented in Klein, et. al.(2003), where JF_{it} is the job flow rates in 3-digit NACE industry i at time t. These include job creation, destruction, net employment growth and excess reallocation rate. OI_{it} is defined as the trade openness variable (see Appendix 2) and E_{it} is the industry-specific real exchange rate. D_i captures the effect of privatisation and ownership at the end of period. We also include other industry-specific variables such as the coefficient of variation of real wages that affect job reallocation rates and time dummies to account for aggregate shocks.

In addition, we have experimented with specifications of equation (1) that included the export share and the import penetration ratio in industry, and have

[7] We determine the lag structure empirically with a general-to-specific approach to establish a more parsimonious representation of the data. Initially, we used two lags on all variables. We also estimated

allowed for the exchange rate to enter both with and without interacting it with the openness index. Since we expect that the change in the exchange rate has a direct effect on job creation and destruction (see Klein, Schuh and Triest (2003b)), we have also accounted for the growth rate of the multilateral industry-specific real exchange rate in our specification. These alternative specifications are not reported in the regression tables since the point estimates of interest are not affected by inclusion of the indicated variables.

The panel structure (95 three-digit level industries over 6 years) of our sample allows us to study the dynamics of partial adjustment in the transition period as well as differing exposure to trade openness, with the inclusion of a lagged dependent variable among the other regressors in the model. It is well accepted that in such dynamic models with relatively large cross-sections over a short time period, 1994-2000, the fixed effects model yields inconsistent estimates. Thus, as pointed out in Eq. 1 above, we specify an error components model (random effects) with $\varepsilon_{it}=\lambda_t+\eta_i+\nu_{it}$. In the presence of lagged dependent variables, this raises well-known additional problems. Earlier work has used maximum likelihood estimators (MLE) and a simple instrumental variable (IV) approach (Bhargava and Sargan, 1983 and Anderson and Hsiao, 1981) to address the issues (endogeneity and inconsistency). The relatively strong assumptions on the distributions of the individual effects and the initial conditions necessary to implement the MLE approach, and the lack of efficiency of the IV, has encouraged the use of the Generalized Method of Moments (GMM) (Hansen, 1982) estimation in recent studies of dynamic panel regressions.[8]

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(1) with the growth rate of the real exchange rate rather than the level, and found no significant differences.

[8] For background and a detailed discussion see Baltagi (1995, Ch.8). For an overview, see Bond (2002) and Hall (2003).

In what follows we use the asymptotically efficient (one-step) GMM advocated by Arellano and Bover (1995) and more recently by Blundell and Bond (1998). This type of GMM estimator usually exploits a different number of instruments in each time period. Under weak assumptions the additional orthogonality conditions that become available here have not been previously used with IV estimators. Therefore, we use transformations of the data that allow lagged endogenous or predetermined variables as instruments in the transformed equations, where the transformed error term does not contain η_i and orthogonality among the errors is preserved (the original errors may be heteroskedastic but not autocorrelated and we treat all variables in our models as endogenous). To ensure consistency, we check for serial correlation in the errors. If ε_{it} are serially uncorrelated, then $\Delta\varepsilon_{it}=\Delta\lambda_t+\Delta\nu_{it}$ may be moving average errors but should not be second-order serially correlated to assure the reliability of our results. Diagnostics, reported in Tables 5 and 6, show that neither the robust Sargan nor MA(1) and MA(2) tests provide evidence to suggest that the assumption of serially uncorrelated errors (second-order) is unrealistic. These tests also show that the choice of the instruments used appears to be appropriate[9]. We use MA(1) and Sargan jointly to determine the validity of our instruments and the correctness of our assumptions. These are reported in the diagnostics section of Tables 5 and 6 to whose main findings we now turn.

The four sector-level job flow measures appear to be mainly driven by the lagged values of job creation and destruction. This finding suggests that idiosyncratic factors explain most of the variation of employment adjustment. In addition,

[9] Where possible, in addition to predetermined variables, we use the lagged differences and levels of real industrial output as instruments in our regressions.

ownership structure seems to be strongly correlated with job flows, as revealed by the significant and large coefficients on the variable *Privshare* in both Tables 5 and 6. A larger private share in an industry leads to less job creation and more job destruction resulting in an increased labour shedding. It is also appears that an industry with a larger private share exhibits less excess job reallocation. From these results we should not, however, infer a causal effect of ownership structure of industries on employment adjustment since the variable Privshare does not capture the evolving ownership distribution in industrial sectors over time. It is instead an-end-of-period variable controlling for the cumulative ownership changes that have occurred in an industry.

Does trade liberalisation affect these job flows? In Table 5, we report a significant positive coefficient on the lagged openness index for EU trade in the job creation and excess job reallocation regressions. Other things equal, sectors engaging in more trade with the rest of the world show increased job destruction rates.

In Table6, where we interact the industry-specific real exchange rate with the openness indices, we find a small positive effect on job destruction for sectors trading with the rest of the world. We also establish that sectors with more trade to CIS countries have a smaller job destruction rate. The positive effect of openness for EU trade does not disappear when the index is interacted with the real exchange rate. Finally, net employment growth occurs in sectors that maintain strong trade ties in the CIS area.

VI. Conclusions

Relating trade openness indices at the industry level to industry-specific job flow measures, we try to establish a causal effect of trade liberalisation on employment adjustment in Ukrainian industry. We calculate these indices for trade flows of three complementary trading areas, the EU, the CIS and the rest of the world in order to account for differences in the underlying forces that might drive Ukrainian trade flows to and from these different areas.

While the analysis is still hampered by various data problems, some rather robust results can be summarised as follows.

- Idiosyncratic factors seem to explain most of the variation of employment adjustment since the sector level job flow measures are mainly driven by lagged values of job creation job destruction.
- A large private share in an industry leads to more labour shedding via lower job creation and more job destruction. Also, an industry with a larger private share exhibits less excess job reallocation. Since we use an end-of-period variable to proxy for the evolution of the ownership structure, these results point to correlations rather than causal effects.
- Our GMM regression results suggest that trade liberalisation does affect job flows. More trade with the EU raises job creation and excess job reallocation, while industries that engage more with the rest of the world show larger job destruction rates. Finally, sectors that are more open in their trade in the CIS trading area have smaller job destruction rates and positive net employment growth.

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Table 1. Gross Job Flows in Manufacturing

Year	*pos*	*neg*	*gross*	*net*	*exc*	*n*
1993-94	0.009	0.108	0.118	-0.099	0.019	7768
1994-95	0.016	0.098	0.114	-0.082	0.033	8023
1995-96	0.019	0.105	0.123	-0.086	0.037	7897
1996-97	0.018	0.113	0.132	-0.095	0.037	8163
1997-98	0.022	0.091	0.113	-0.069	0.045	7670
1998-99	0.030	0.094	0.124	-0.064	0.060	9066
1999-2000	0.041	0.081	0.122	-0.041	0.081	8077

Table 2. Distribution of Annual Employment Growth Rates: Firm level

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%	Mean	StDev	N
93-94	-0.547	-0.332	-0.255	-0.158	-0.078	-0.007	0.043	0.086	0.304	-0.091	0.159	7768
94-95	-0.579	-0.321	-0.239	-0.137	-0.052	0.000	0.059	0.104	0.323	-0.073	0.164	8023
95-96	-0.750	-0.378	-0.273	-0.161	-0.068	0.000	0.061	0.108	0.347	-0.093	0.196	7897
96-97	-1.012	-0.405	-0.280	-0.163	-0.078	-0.004	0.055	0.121	0.522	-0.101	0.234	8162
97-98	-0.957	-0.386	-0.272	-0.145	-0.059	0.006	0.090	0.204	0.852	-0.071	0.254	7670
98-99	-1.283	-0.541	-0.333	-0.164	-0.063	0.014	0.131	0.300	1.077	-0.082	0.320	9066
99-00	-1.267	-0.588	-0.358	-0.167	-0.050	0.037	0.157	0.297	0.777	-0.082	0.309	8077

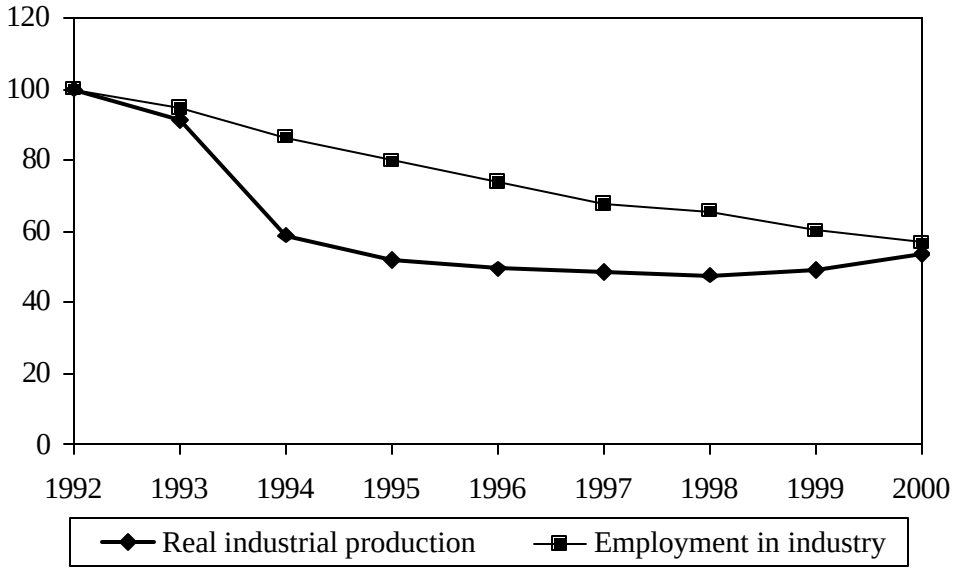
Table 3. Distribution of Annual Sectoral Job Creation Rates

Year	1%	5%	10%	25%	50%	75%	90%	95%	99%	Mean	StDev
93-94	0	0	0	0.001	0.004	0.012	0.030	0.071	0.226	0.013	0.029
94-95	0	0	0	0.002	0.008	0.023	0.045	0.061	0.156	0.016	0.024
95-96	0	0	0	0.003	0.009	0.024	0.048	0.087	0.318	0.023	0.046
96-97	0	0	0	0.002	0.010	0.021	0.038	0.086	0.143	0.018	0.027
97-98	0	0.001	0.002	0.008	0.018	0.032	0.045	0.067	0.104	0.023	0.020
98-99	0	0	0.002	0.008	0.025	0.046	0.070	0.090	0.428	0.034	0.049
99-00	0	0.003	0.011	0.019	0.033	0.060	0.090	0.120	0.219	0.044	0.038

Table 4. Distribution of Annual Sectoral Job Destruction Rates

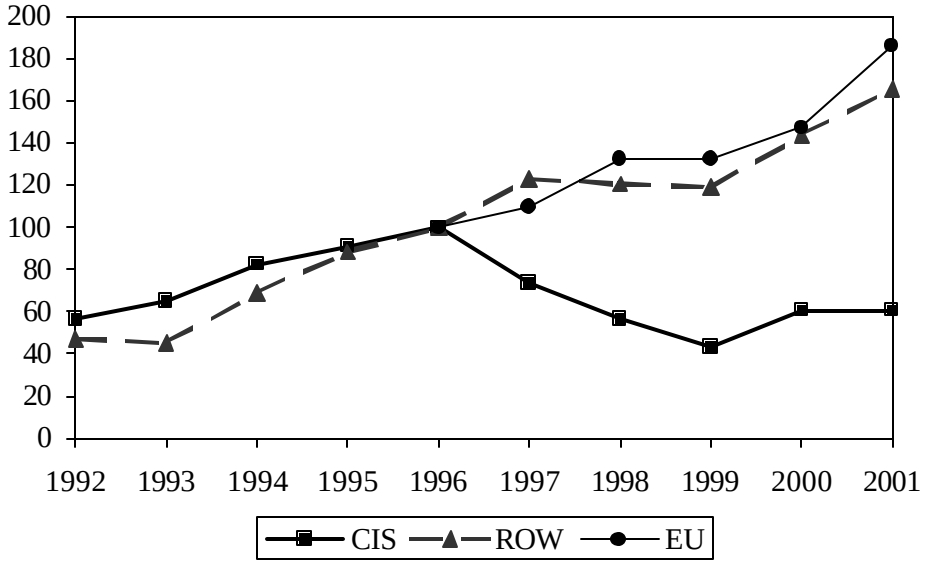
Year	1%	5%	10%	25%	50%	75%	90%	95%	99%	Mean	StDev
93-94	0	0.018	0.038	0.064	0.113	0.146	0.184	0.212	0.263	0.111	0.057
94-95	0	0.007	0.017	0.045	0.085	0.130	0.193	0.222	0.405	0.095	0.071
95-96	0	0.008	0.026	0.050	0.106	0.156	0.215	0.286	0.404	0.116	0.080
96-97	0.011	0.022	0.033	0.075	0.114	0.160	0.196	0.241	0.369	0.121	0.067
97-98	0.006	0.022	0.035	0.060	0.100	0.144	0.171	0.199	0.555	0.107	0.070
98-99	0	0.012	0.017	0.069	0.111	0.148	0.212	0.301	0.433	0.118	0.080
99-00	0	0.011	0.028	0.070	0.103	0.135	0.179	0.207	0.335	0.104	0.060

Figure 1. Employment and Production in Ukrainian Industry, 1992-2000 (1992=100)



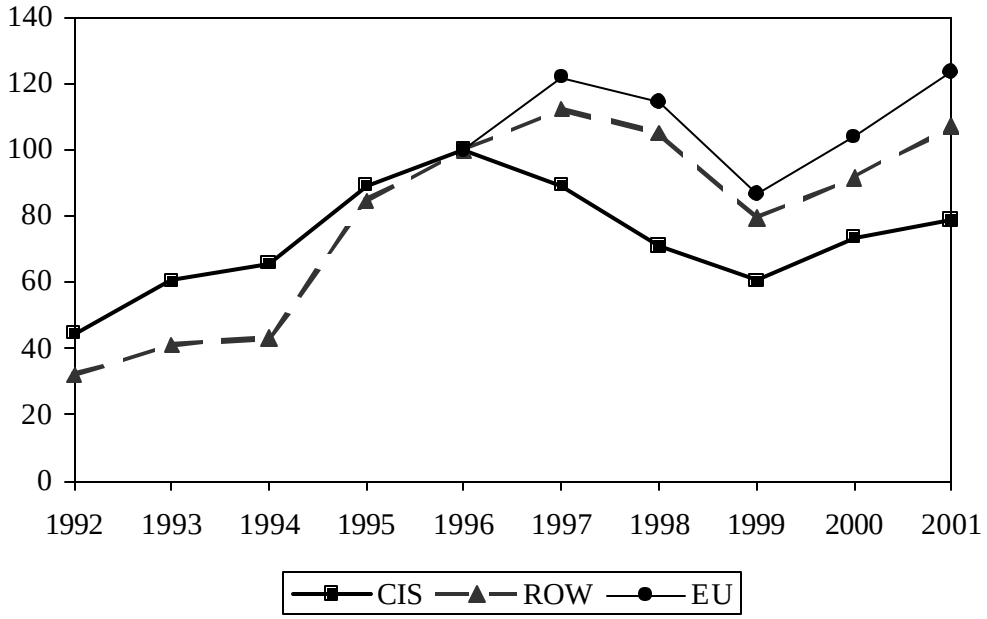
Source: Derzhkomstat, TACIS

Figure 2. Dynamics of Ukrainian Exports, 1992-2001 (1996=100)



Source: Commonwealth of Independent states in 2001 (2002)

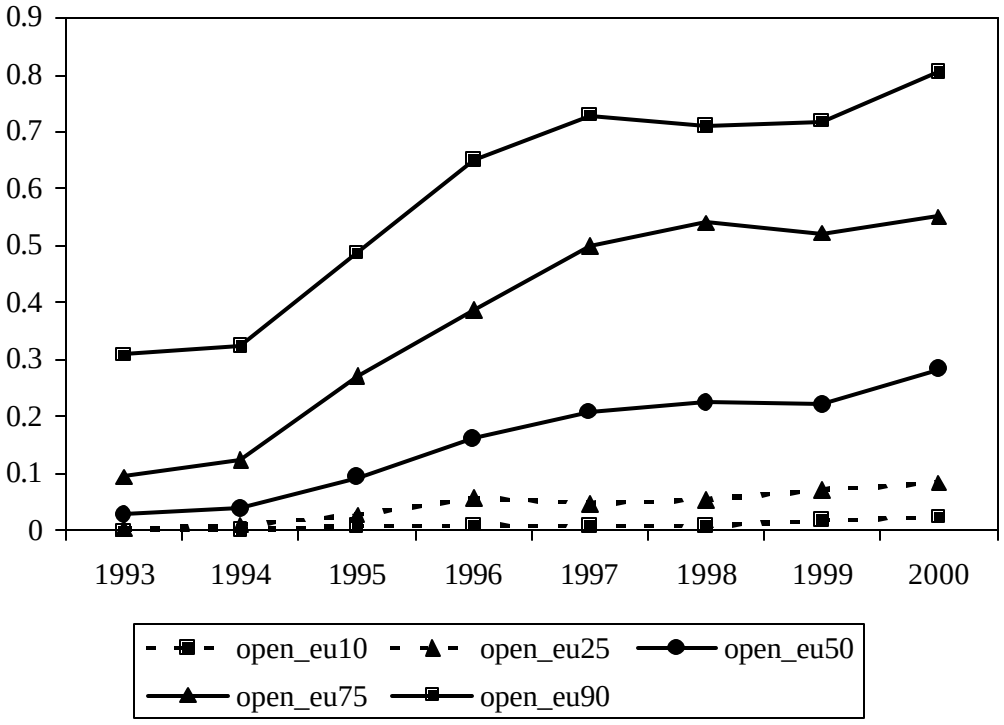
Figure 3. Dynamics of Ukrainian Imports, 1992-2001 (1996=100)



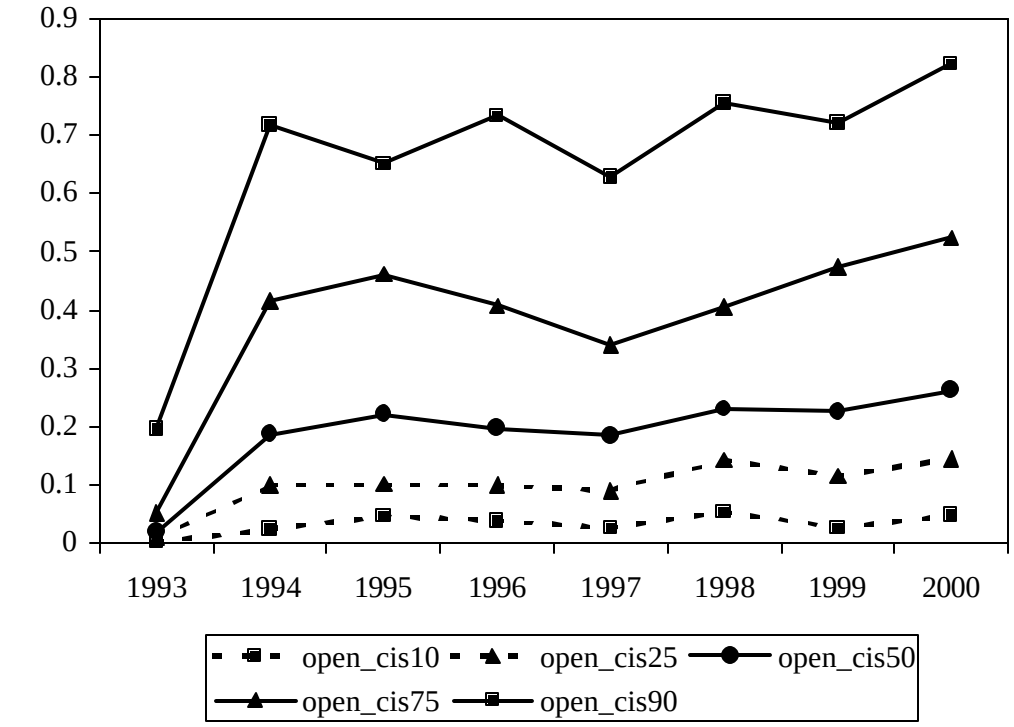
Source: Commonwealth of Independent states in 2001 (2002)

Figure 4. Percentile distribution of openness over 3-digit sectors

A) EU countries



B) CIS countries



C) Rest of the World

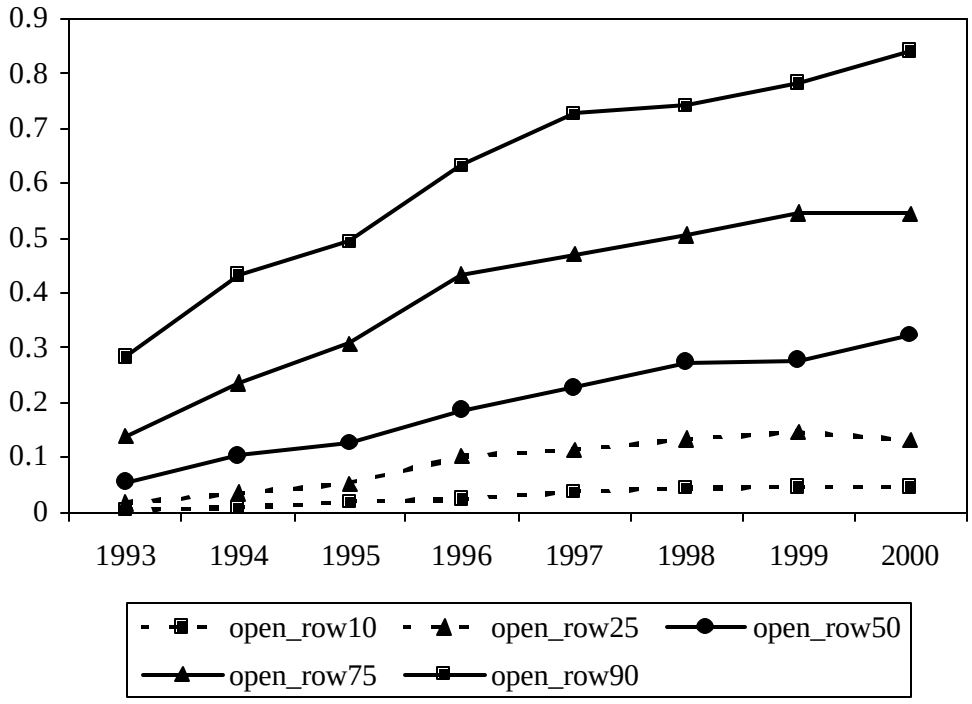
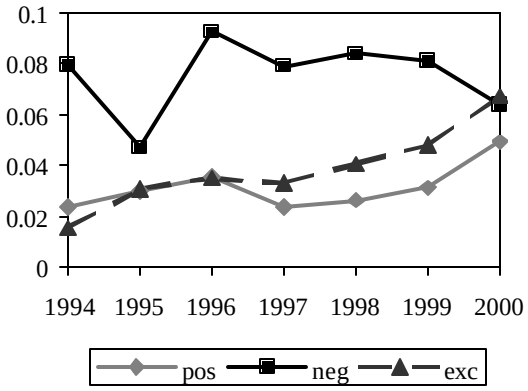
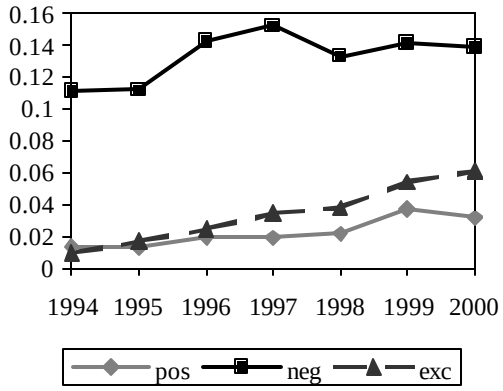


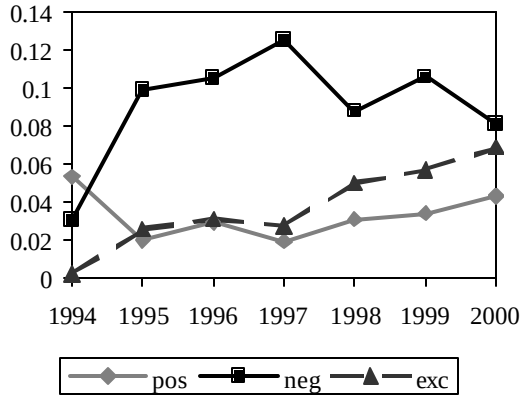
Figure 5. Trade openness and sectoral job flows



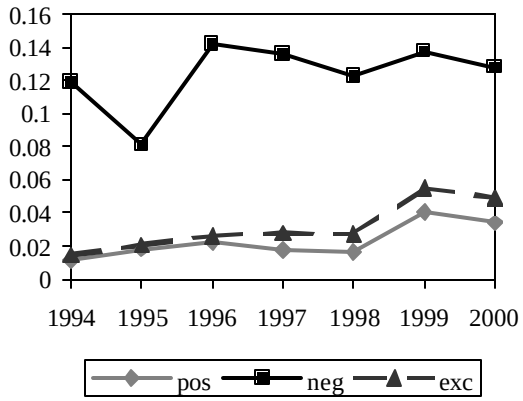
EU countries – lower 25%



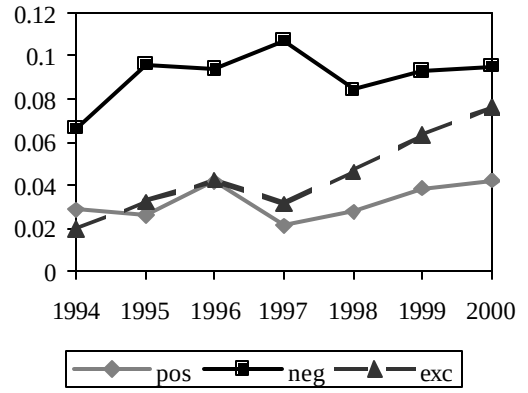
EU countries – upper 25%



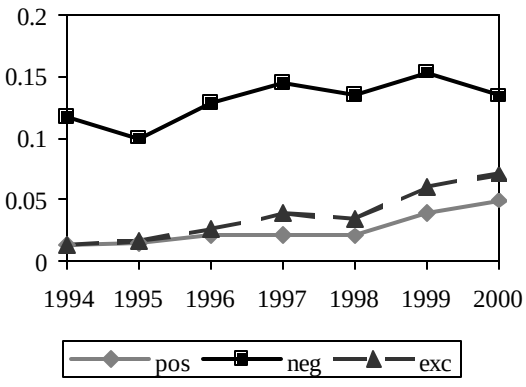
CIS countries – lower 25%



CIS countries – upper 25%



ROW countries – lower 25%



ROW countries – upper 25%

TABLE 5

JOB FLOWS: GMM-system estimates: Dependent variable JOB CREATION, JOB DESTRUCTION, NET EMPLOYMENT GROWTH and EXCESS REALLOCATION

Period 1994-2000, 576 Observations available for estimation

Independent Variables	JOB CREATION	**JOB DESTRUCTION**	NET EMPLOYMENT GROWTH	EXCESS REALLOCATION
$\mathbf{JC_{i(t-1)}}$	0.284	0.048	0.236	0.378
	(4.51)	(0.77)	(2.42)	(5.23)
$\mathbf{JD_{i(t-1)}}$	0.119	0.470	-0.351	0.168
	(1.28)	(8.14)	(-2.78)	(1.94)
$\mathbf{OI\_EU_{it}}$	-0.039	0.055	-0.094	-0.091
	(-0.57)	(0.74)	(-0.91)	(-1.32)
$\mathbf{OI\_EU_{i(t-1)}}$	0.066	-0.077	0.144	0.079
	(1.69)	(-0.93)	(1.58)	(2.06)
$\mathbf{OI\_CIS_{it}}$	0.031	0.015	0.016	0.037
	(0.35)	(0.19)	(0.11)	(0.50)
$\mathbf{OI\_CIS_{i(t-1)}}$	0.062	-0.078	0.139	0.065
	(1.19)	(-1.14)	(1.50)	(1.26)
$\mathbf{OI\_ROW_{it}}$	-0.005	0.155	-0.160	-0.004
	(-0.07)	(1.85)	(-1.18)	(-0.08)
$\mathbf{OI\_ROW_{i(t-1)}}$	-0.072	-0.078	0.006	-0.087
	(-1.27)	(-1.28)	(0.07)	(-1.28)
$\mathbf{E_{it}}$	0.011	-0.005	0.015	0.020
	(0.75)	(-0.29)	(0.56)	(1.59)
$\mathbf{PRIV\ SHARE_i}$	-0.203	0.169	-0.373	-0.106
	(-2.32)	(2.32)	(-2.81)	(-1.01)
Diagnostics:				
MA(1)	-1.822	-4.101	-2.591	-2.124
MA(2)	1.172	0.113	-0.365	0.674
Sargan Test	82.12	79.96	82.81	83.71
	(77)	(77)	(77)	(77)
Wald Test for Time Dummies	12.25	20.83	17.89	25.96
	(5)	(5)	(5)	(5)

NOTES: 1) System GMM estimates are obtained by stacking (T-2) equations in first differences and in levels corresponding to periods 3,…,T. We then use lagged differences of the variables as instruments in levels (dated t-1, etc.) in addition to the instruments specified for the difference equations.

2) The t-statistic, reported in the parentheses below the point estimates, is corrected and robust to heteroskedasticity over industries and time. A Constant and Time dummies are always included but not reported; the Wald test for the joint significance of those is reported in the last row of the table; it is chi-square under the null of no significance (degrees of freedom are in parenthesis). MA(1) is a test of first-order serial correlation, based on the standardized first-difference residual autocovariances asymptotically distributed as N(0,1) under the null of no autocorrelation. Sargan's test is a test of over-identifying restrictions, which is a chi-square under the null of no significance or instrument validity (degrees of freedom (number of restriction) given in parenthesis).

TABLE 6

JOB FLOWS: GMM-system estimates: Dependent variable JOB CREATION, JOB DESTRUCTION, NET EMPLOYMENT GROWTH and EXCESS REALLOCATION

Period 1994-2000, 588 Observations available for estimation

Independent Variables	JOB CREATION	**JOB DESTRUCTION**	NET EMPLOYMENT GROWTH	EXCESS REALLOCATION
$\mathbf{JC_{i(t-1)}}$	0.258	-0.020	0.278	0.279
	(2.75)	(-0.21)	(1.86)	(3.93)
$\mathbf{JD_{i(t-1)}}$	0.076	0.469	-0.393	0.152
	(1.09)	(9.18)	(-4.30)	(2.25)
$\mathbf{OI\_EU_{it}*E_{it}}$	-0.011	0.012	-0.023	-0.014
	(-1.08)	(0.91)	(-1.36)	(-1.55)
$\mathbf{OI\_EU_{i(t-1)}*E_{i(t-1)}}$	0.013	-0.011	0.025	0.019
	(1.38)	(-0.81)	(1.43)	(2.17)
$\mathbf{OI\_CIS_{it}*E_{it}}$	0.015	-0.046	0.061	0.025
	(0.95)	(-2.74)	(2.20)	(1.72)
$\mathbf{OI\_CIS_{i(t-1)}*E_{i(t-1)}}$	-0.003	0.032	-0.035	-0.016
	(-0.42)	(1.98)	(-1.67)	(-1.33)
$\mathbf{OI\_ROW_{it}*E_{it}}$	0.005	0.024	-0.018	-0.000
	(0.46)	(1.88)	(-0.99)	(-0.03)
$\mathbf{OI\_ROW_{i(t-1)}*E_{i(t-1)}}$	-0.010	-0.022	0.019	-0.002
	(-0.43)	(-1.96)	(1.21)	(0.19)
$\mathbf{PRIV\ SHARE_i}$	-0.104	0.084	-0.189	-0.075
	(-1.89)	(1.78)	(-2.36)	(-1.73)
Diagnostics:				
MA(1)	-1.947	-4.060	-2.518	-2.255
MA(2)	1.078	0.740	-0.316	0.704
Sargan Test	90.13	87.55	86.58	91.87
	(95)	(95)	(95)	(95)
Wald Test for Time Dummies	19.10	15.59	22.60	25.17
	(5)	(5)	(5)	(5)

NOTES:

1) See 1) and 2) of Table 5.

APPENDIX 2

Definitions of variables used in estimation

Variable	Description	Definition	Source
JC_{it}	Job creation rate in industry *i* in year *t*	$\frac{\sum_{p \in M^+} \Delta Emp_{pit}}{1/2(Emp_{it} + Emp_{i(t-1)})}$, where $M^+ = \{p_l' \ ?Emp_{pit} > 0\}$	Derzhkomstat registry of industrial enterprises, 1993-2000
JD_{it}	Job destruction rate in industry *i* in year *t*	$\frac{\sum_{p \in M^-} \lvert \Delta Emp_{pit} \rvert}{1/2(Emp_{it} + Emp_{i(t-1)})}$, where $M^- = \{p_l' \ ?Emp_{pit} < 0\}$	Derzhkomstat registry of industrial enterprises, 1993-2000
JF_{it}	Job flow rates in industry *i* in year *t*	$\{JC_{it}, JD_{it}, JR_{it}, JN_{it}, JE_{it}\}$	Derzhkomstat registry of industrial enterprises, 1993-2000
OI_EU_{it}	Openness index with EU countries in industry *i* in year *t*	$\frac{Exp\_EU_{it} + Imp\_EU_{it}}{Exp\_EU_{it} + Imp\_EU_{it} + Prod_{it}}$ where Exp_EU denotes exports to EU countries (nominal USD), Imp_EU denotes imports from EU countries (nominal USD), and Prod denotes sectoral production in nominal USD (converted from UHA using official average annual exchange rate)	Derzhkomstat registry of industrial enterprises for production, Ukrainian Customs Committee data on import and export volumes by countries of origin and destination
OI_CIS_{it}	Openness index with CIS countries in industry *i* in year *t*	$\frac{Exp\_CIS_{it} + Imp\_CIS_{it}}{Exp\_CIS_{it} + Imp\_CIS_{it} + Prod_{it}}$ where Exp_CIS denotes exports to CIS countries (nominal USD), Imp_CIS denotes imports from CIS countries (nominal USD), and Prod denotes sectoral production in nominal USD (converted from UHA using official average annual exchange rate)	Derzhkomstat registry of industrial enterprises for production, Ukrainian Customs Committee data on import and export volumes by countries of origin and destination
OI_ROW_{it}	Openness index with countries from the rest of the world in industry *i* in year *t*	$\frac{Exp\_ROW_{it} + Imp\_ROW_{it}}{Exp\_ROW_{it} + Imp\_ROW_{it} + Pro}$ where Exp_ROW denotes exports to ROW countries (nominal USD), Imp_ROW denotes imports from	Derzhkomstat registry of industrial enterprises for production, Ukrainian Customs Committee data on import and

		ROW countries (nominal USD), and Prod denotes sectoral production in nominal USD (converted from UHA using official average annual exchange rate)	export volumes by countries of origin and destination
E_{it}	Multilateral real exchange rate	$\sum_{j=1}^{3} w_{ij(t-1)} E_{jt}$, where j indexes 3 trading areas (EU, CIS, ROW), Ejt denotes bilateral real exchange rate (UHA to Euro, Russian Ruble and USD correspondingly) defined as [ln(nominal exchange rate$_{jt}$) +ln(ukrppi$_t$)-ln(ppi$_{jt}$)], and $w_{ij(t-1)}$ denotes industry-specific trade share weights in the previous year	National Bank of Ukraine (http://www.bank.gov.ua) for the official exchange rates, *OECD Economic Trends* for PPI in EU countries, *Russia in Figures* for PPI in Russia, *Ukrainian Economic Trends* for PPI in Ukraine, BLS data base for US PPI
Privshare$_i$	Share of non-state firms in sector *i* in 2000		Derzhkomstat firm-level data on ownership in 2000

APPENDIX 2
Institutional Changes and Trade Regime

Institutional changes in the international trade regime in Ukraine

Time	Event
November 1994	The system of export quotas and licenses, which had covered 40% of exports, was narrowed to include only grain, ferrous and nonferrous scrap, cast iron, and coal, in addition to goods subject to voluntary export restraint or other international agreements. A new system of export contract pre-registration was adopted; 20 categories of goods were originally subject to the registration requirement, in addition to all goods traded under barter arrangements
December 1994	The state orders and contracts systems for foreign trade were eliminated
January 1995	Export quotas and licenses on all above products except grain were eliminated
March 1995	The scope of export contract pre-registration was limited to goods subject to the special export regime, voluntary export restraint, and actual or potential antidumping actions. A system of minimum indicative prices for a range of export products covering one-half of total exports was instituted
December 1995	Indicative export prices were removed for all good except for goods subject to actual and prospective antidumping actions and voluntary export restraints.
January 1996	Licensing requirement for grain exports was abolished. Import tariffs on many agricultural goods were raised to 30 %.
April-May 1996	Export taxes, once fully eliminated, were reapplied to animals and skins in April 1996 and to ferrous and nonferrous metals and scrap in May 1996
June 1996	Import duties of about 15% on coal and refined petroleum products were introduced. Specific or mixed ad-valorem /specific tariffs have been introduced for numerous food products, motor vehicles, tires, textiles and clothing, alcohol, tobacco, furs, and radio equipment.
June 1997	Export surrender requirement was revoked
March 1998	Limits on auto imports were imposed
September 1998 July 1999	Foreign exchange restrictions were re-introduced. Limits were imposed on the making of advance import payments. A 50% surrender requirement was introduced. A uniform, nondiscriminatory import surcharge of 2% was introduced. The restriction on advance import payments was eliminated.
September 1999	An export duty on sunflower seeds was introduced.
January 2000	A uniform, nondiscriminatory import surcharge of 2% was eliminated. The number of excisable imported goods has decreased from 20 to 5 categories (alcohol, tobacco, oil products, automobiles, jewelry).

Sources: EBRD Transition Report 2002, IMF annual report on exchange arrangements and exchange restrictions (several issues)

1999-2001 IMF annual report on exchange arrangements and exchange restrictions

Import non-tariff measures are limited to those for national safety and environmental reasons.

From January 4, 2000, goods subject to import licensing include: agricultural chemicals, pharmaceutical products (except dental materials and sutures), veterinary medicines, cosmetics, hygiene products, matrix forms used in the manufacturing of audio production, and ozone-depleting chemical substances.

Import taxes and/or tariffs

There are three customs duty rates with a trade –weighted average rate of about 5 % (including energy imports)[10]. The first category (preferred duty rate) applies to goods from countries with which Ukraine has a free trade agreement, imports from developing countries, and imports from countries that have a preferential agreement with Ukraine. The second category (concessional duty rate) applies to imports from countries that have entered into MFN agreements with Ukraine. The third category applies to imports from other sources. A uniform, nondiscriminatory import surcharge of 2% was in effect between July 1, 1999 and December 31, 1999. A VAT of 20% is levied on most imports. Some imports are subject to excise taxes (the number of excisable imported goods decreased from 20 to 5 categories in early 2000).

Export licenses

Goods subject to voluntary export restrains or other international agreements and those falling under the "special export regime" – coal, precious metal scrap, and alcoholic spirits – are also subject to export quotas and licenses. The licenses required for these goods are, however, freely provided, except in the case of precious metal scrap. For grain exports, it is required that sales for the export market be undertaken through the agricultural commodity exchange. Export contract preregistration is limited to goods subject to voluntary export restrains or antidumping actions. The "special export" regime has been liberalized; registration of exports is automatic and for statistical purposes only.

Export taxes

Taxes are applied to exports of livestock, skins and hides. Effective September 30, 1999, this tax was extended to exports of sunflower seeds.

2001 Country Reports on Economic Policy and Trade Practices
Released by the Bureau of Economic and Business Affairs
U.S. Department of State, February 2002

5. Significant Barriers to Imports

An array of taxes and duties remains a major obstacle to trade or investment. These taxes include VAT, import duties and excise taxes. Import duties differ and largely depend upon whether a similar item to that being imported is produced in Ukraine; if so, the rate may be higher. The maximum import duty in Ukraine is currently 20 percent, a reduction from 25 percent last year. Excise duty rates are charged in addition to import duties and range from 10 to 100 percent of the declared customs value. This can result in duties and fees amounting to over 100 percent of the declared value of the item. In July 2001, a new law "On Customs Tariff of Ukraine" entered into force. Under this law, the government cannot introduce or change import tariffs and duties without corresponding legislation from the Rada. Ukraine's tariff system now encompasses 97 product categories and lists over 10,000 products subject to import duties. A new law "On Introducing Changes in Certain Legal Acts Regarding Taxation of Excisable Goods" entered into force in January 2000. Under this law, the number of excisable goods has decreased. Goods still subject to excise taxes now fall into five main groups: alcohol, tobacco, oil products, automobiles, and jewelry. Previously there had been 20

[10] The weighted tariffs increased over the nineties from 4.2% in 1995 to 7.5% in 1999. Excluding energy, the average weighted tariff reached 12.6% in 1999.

categories of excisable goods. All imported goods are subject to VAT (currently 20 percent). Energy imports are technically also subject to VAT, but the rate has been set at zero.

Ukraine's domestic production standards and certification requirements are arduous but apply equally to domestically produced and imported products and can thus be seen as an impediment to business in general rather than just to U.S. exports. Product testing and certification generally relate to technical, safety and environmental standards, and efficacy requirements for pharmaceutical and veterinary products. Such testing often requires official inspection of the company's production facility at the company's expense. Unfortunately, testing is often done in sub-standard facilities and on a unit-by-unit basis rather than "sample" testing. In cases where Ukrainian standards are not established, country of origin standards may be accepted.

Import licenses are required for very few goods. Goods that need licenses include medicines, pesticides, and some industrial chemical products. The United States is urging Ukraine to enact licensing legislation for optical media production. These licensing requirements would help alleviate the severe CD piracy problem in Ukraine.

6. Export Subsidies Policies

Over the last several years, as part of its effort to balance the budget, the government has significantly reduced the amount of direct subsidies it provides to state-owned industries. Nonetheless, subsidies remain an important factor in Ukraine's economy, particularly in the coal and agriculture sectors. These subsidies, however, do not appear to be specifically designed to provide direct or indirect support for exports, but rather to maintain full employment and production during the transition to a market-based economy. The government does not target export subsidies specifically to support small business.

As of 2001, there were eleven Special Economic Zones (SEZ) and nine priority investment territories (PIT) in operation, offering tax and import duty exemptions and other benefits to encourage investment and production of goods for export. The zones have been criticized for encouraging existing firms to relocate, rather than spurring new investments, and for being used to import finished consumer goods tax-free. There is a moratorium on creation of new SEZs until 2003. Nevertheless, such regions remain a significant factor in Ukraine's strategy for attractin g investment, and no existing SEZs or PITS have been phased out. The IFIs, IMF and World Bank, have suggested that the zones be eliminated and have advised the government to focus instead on improving the overall investment climate in the entire country. The government has said that it will gauge the effectiveness of all SEZs and PITs to determine whether any should be eliminated.