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DOLLARIZATION IN THE CIS: THE CASE OF UKRAINE

Like many emerging market economies, the Ukrainian economy is partially dollarized — in fact, its entire period of independence has been marked by significant dollarization. What makes this situation more striking is that, while Ukraine has witnessed two very different monetary regimes since independence, the extent of dollarization appears to be largely unchanged across the two regimes. We offer an explanation of this phenomenon, highlighting the significant role the shadow economy plays in Ukraine, and we discuss implications/or dollarization or euroization in Ukraine's future.

An economy is partially dollarized when a foreign currency (often the US dollar) performs at least some of the major functions of money alongside a domestic currency. Like many emerging market economies throughout the world and all the economies of the Commonwealth of Independent State (CIS), the diplomatic successor of the Soviet Union, the economy of Ukraine is partially dollarized (Antinolfi and Keister, 2001). Indeed, the entire period of independence from the Soviet Union, starting in August 1991, has been marked by a partially dollarized Ukrainian economy. What makes this situation even more striking is that, while Ukraine has witnessed two very different monetary regimes during independence, the extent of dollarization appears to have been largely unchanged across the two regimes. This phenomenon calls for an explanation; this paper provides it.

In Section 1 and 2, we describe those two regimes: the Russian ruble zone and its aftermath, 1991-1996; and the hryvnia in a managed exchange rate regime, with the National Bank of Ukraine (NBU) as the manager, 1996-present. In Section 3, we show why dollarization was present in each regime. Here we rely heavily on search-theory models of money, as represented by Curtis and Waller (2000) and Waller and Curtis (2001). In particular,

we show why dollarization is an equilibrium outcome under both regimes, despite the differing legal status of the dollar.

Next, in Section 4, we argue why the observed extent of dollarization appears to be the same across the two regimes. A crucial piece of the argument for the latter is the shadow economy of Ukraine, one of the largest as a percentage of GDP in the world. The size of the shadow economy is roughly stable across the two monetary regimes, as is the role of the dollar in that shadow economy.

Finally, in Section 5, we consider the policy implications of dollarization for Ukraine in the near term. For instance, the dollar continues to play the role of the unit of account in Ukraine's international trade — here, the main statistics are denominated in US dollars. As we project into the future, the role of the euro vis-a-vis the dollar must be given more consideration, depending on the extent to which Ukraine becomes bound more tightly to the EU regional supply chain.

1. Monetary Regime 1 - the Russian Ruble Zone and its Aftermath

At the moment of its declaration of independence from the Soviet Union in August 1991, the

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currency of Ukraine was the Soviet ruble. Ukraine, as with the other former Soviet republics who joined the Commonwealth of Independent State (CIS), continued to belong to the now Russian-ruble zone. During 1992-1993, that ruble zone collapsed (see Gros and Steinherr, 1995, chapter 13.4 for a detailed account of the collapse). One of the first acts of the government of newly independent Ukraine was the creation of a provisional national currency, the karbovanets (Krb) (also called "coupons"), introduced into circulation in January 1992. The National Bank of Ukraine (NBU) instituted its Foreign Currency Exchange in August of that same year. Throughout 1992, karbovanets and rubles circulated at par. The payments system for the various newly independent republics remained centered in Russia, with all payments automatically credited in Russia before clearance.

This arrangement, called by Stanley Fischer "the worst monetary constitution one can imagine" (Gros & Steinherr, 1995), created a severe common-pool resource problem. Republics like Ukraine could, via money creation, increase the domestic money supply by 100 % increasing the ruble zone money supply by a much smaller percentage. Indeed, one of the landmarks of the downfall of the ruble zone was a large money emission by Ukraine in July 1992. Plans sponsored by the IMF to create a better monetary constitution resulted in an agreement on an Interstate Bank — a supranational Central Bank for the ruble zone, which Ukraine among others signed in January 1993. However, the Interstate Bank never saw the light of day. Although there have been attempts, then and now, to see in the Russian-ruble zone an optimal currency area, the arguments are at best inconclusive. So far, among the successor states of the former Soviet Union, only Belarus has rejoined the Russian-ruble zone.

The ruble was a weak currency despite IMF support, falling rapidly against the US dollar, due in large part to inflation throughout the ruble zone. This situation of rapidly eroding value spurred a demand for dollars instead of rubles as a store of value, a crucial (and enduring) aspect of dollarization in Ukraine. For dollars to serve as a store of value, they had to be made available to the public. To this end, the NBU began granting licenses for executing trades in foreign currency (principally dollars and rubles) in February 1993. There were two kinds of licenses, general and individual. General licenses are issued to banks and other financial companies. A licensed bank or any company that signed an agency contract with a licensed

bank could open an "exchange point" where coupons could be sold for foreign currency and vice versa. These general licenses remain in effect today. Individual licenses were given to companies for a specified period of time, to conduct trades of goods and services on Ukrainian territory in foreign currency, to open accounts in banks outside Ukraine, and to invest otherwise abroad. Holders of individual licenses could not open exchange points. In November 1994, the NBU stopped issuing individual licenses, and as of August 1, 1995, stopped renewal and validity of existing individual licenses. Since that date, only holders of general licenses may conduct foreign exchange operations. Finally, since October of that year, the NBU has required that exchange points be equipped with computers or electronic cash machines.

The beginning of the end of the ruble zone in Ukraine was signaled by the government declaration of November 1992, that henceforth the Russian ruble was no longer legal tender in Ukraine. Karbovanets were the sole legal tender in Ukraine, but dollars were not excluded as a legal means of payment. That exclusion only appeared in legislation in August 1995, from which time on only holders of general licenses may use dollars as a medium of exchange inside Ukraine.

Beginning in November 1992, dollars acquired a significant role as a unit of account (e.g., in advertisements for flats in large cities) and as a medium of exchange (e.g., rents on those flats), in addition to its function as store of value. Even its loss of legal status in 1995 did little to diminish its functioning as money, for it remained a principal medium of exchange in the shadow economy.

Another key government policy that led to the use of dollars in Ukraine was the method used for dealing with tax arrears accumulated by individuals or firms. After independence, the breakdown in trading arrangements across the former Soviet Union left many firms illiquid due to large accounts receivable. The lack of liquidity forced them to suspend wage payments to workers. Consequently, both firms and workers delayed tax payments to the government and accumulated substantial tax arrears. The government's policy was that any firm or individual who was in tax arrears could have their bank account balances seized by the government in lieu of payment. Not surprisingly, no one deposited funds in the domestic banks to avoid confiscation and they resorted to cash for trading. Since domestic currency carried a substantial inflation risk, dollars became the medium of exchange for a large share of domestic transactions.

Firms also use dollars in inter-industry trade to evade the profits tax, which can approach effective rates of 100 %. In principal, conducting business transactions in the domestic currency would allow firms to avoid the profits tax. The reality, however, is that in periods of high inflation and/or frequent exchange rate fluctuations, the cash of choice for a firm has usually been the US dollar. The other common way to evade taxes was to conduct barter deals among firms. However, barter is relatively inefficient and is typically done by illiquid firms.

Although money growth and inflation in Russia were serious problems, these were even greater problems in Ukraine. Money supply (as measured by M3) was growing twice as fast in Ukraine as in Russia, and inflation was also higher in Ukraine. Indeed, in the entire period of independence, inflation (as measured by the CPI) in Ukraine has been a persistent problem, although there is some dispute in the figures as to its exact extent. Table 1 shows the NBU figures.

Table 1. Inflation rate, Dollarization

Year	Inflation Rate (%)	UAH to \$1, end of year	Dollarization Ratio (%), NBU	Dollarization Ratio (%), UEPLAC	Domestic Currency Deposit Interest Rates (%)	Foreign Currency Deposit Interest Rates (%)
1991		**	**	**	**	**
1992	210	0.0064	20	16	68.0	**
1993	10260	0.1261	28	49	187.3	**
1994	50	1.0420	42	56	171.0	**
1995	280	1.7940	37	38	61.2	**
1996	40	1.8890	30	35	34.3	**
1997	10	1.8990	26	26	18.2	**
1998	20	3.4270	39	40	22.3	9.7
1999	19	5.2163	44	45	20.7	9.0
2000	26	5.4345	38	39	13.5	5.8
2001	6	5.3556	32	33	11.0	5.6

Source: National Bank of Ukraine (NBU), unless otherwise noted; ** — not available.

From the data, we can see that the peak year for inflation was 1993. In this year, an essentially confiscatory hyperinflation took place, driven to a large extent by government emissions, which wiped out the nominal value of assets like bank accounts. This again increased demand for dollars as a store of value.¹

In the period of 1992—1994, given much higher inflation in Ukraine than in Russia, the exchange rate of the karbovanets to the ruble fell steadily, from 1 : 1 in November 1992 to over 10:1 by the end of 1994. Even the ruble was a much better store of value than the coupon. With inflation rates like these, it is no wonder that the public was clamoring for dollars to protect what real value they could.

At the same time, the central government began efforts to control emissions, bring down the hyperinflation, and restore confidence in the currency on

the part of the citizenry — all as run-up to the introduction of the national currency, the Ukrainian hryvnia (UAH). The greatly reduced inflation rates of 1994 and 1995 are testimony to the government's efforts in this direction. In 1996, by the time of the fifth anniversary of independence, the government decided sufficient progress towards stabilization had been made, and it replaced the provisional currency with the UAH. The stabilization may have been to some extent illusory, given the problem of arrears that persisted until very recently. This sets the stage for monetary regime II.

2. Monetary Regime II - the Hryvnia in Exchange Rate Management

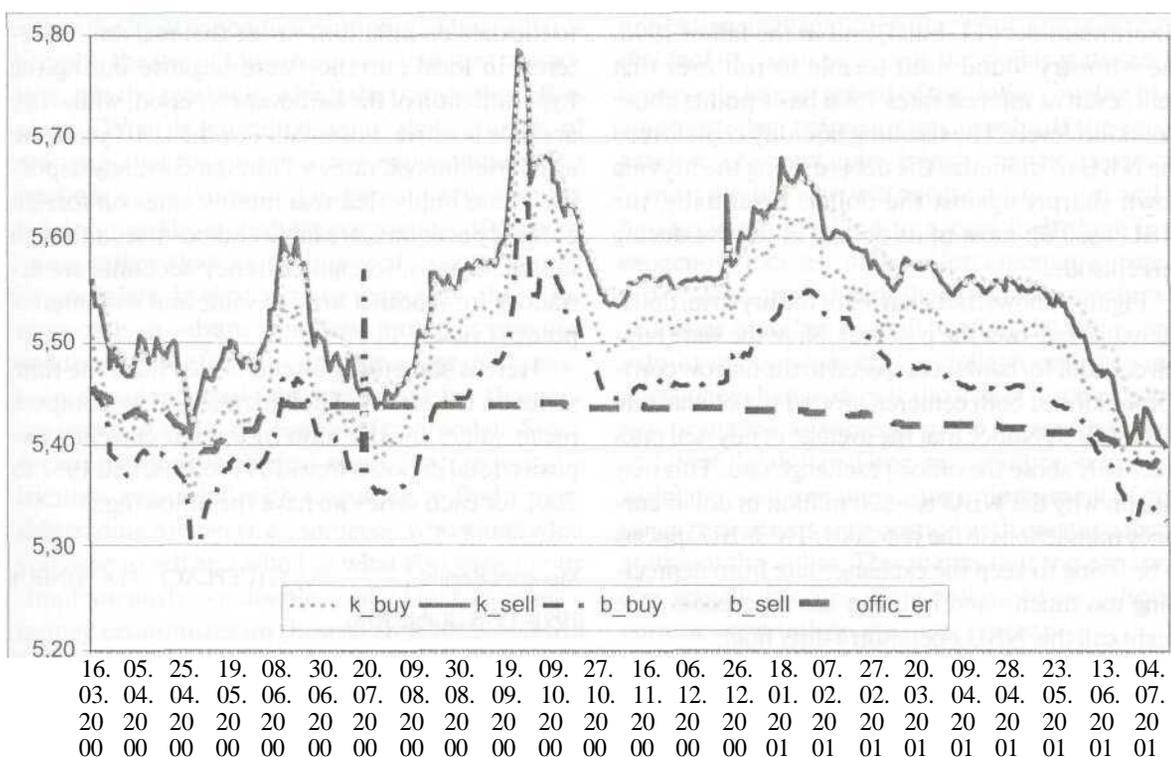
The replacement of the provisional currency, the karbovanets, with the permanent currency, the

¹ Domestic inflation tells us something about the purchasing power of the hryvnia (and the karbovanets earlier) and lends support for the hypothesis that Ukrainians will hold dollars as a store of value in the legal economy; however, official inflation data tells us nothing explicitly about prices in the shadow economy, so we cannot draw any conclusions about the dollar's purchasing power in the illegal sector.

hryvnia (UAH), took place on September 16, 1996. In the two weeks prior to that date, all karbovanets were withdrawn from circulation, with all existing exchange points performing this service, as well as an additional 10,320 exchange points opened expressly for this purpose. In addition, during this 2-week period, all bank deposits were converted to hryvnia. Conversion took place at the official rate of 100,000 Krb = 1 UAH. According to official estimates, 97 % of all karbovanets were withdrawn from circulation during the allotted time.

The hryvnia was intended to trade in a corridor against the dollar. The NBU set that corridor

as 1.8 UAH to 2.2 UAH = \$ 1, and maintained the corridor in this band for the first two years of its existence, as Table 1 shows. The figures for 1992-1994 reflect the effect of the hyperinflation in the karbovanets on the implied exchange rate with the dollar. The Russian crisis of August 1998, and its echo in Ukraine, drove the hryvnia out of its corridor and resulted in an 81% devaluation relative to the dollar by the end of 1998. This downward trend continued in 1999, with a further 52 % devaluation. Since 1999, the hryvnia has remained inside a new corridor of 5.2 to 5.6 UAH = \$1 (see Fig. 1).



Source: NBU data, and data from the web-site <http://www.finance.com.ua>;

k^buy — buy price of the dollar in kiosks (Kyiv); k_sell — sell price of the dollar in kiosks (Kyiv); b_buy — buy price of the dollar in banks (Kyiv); b_sell — sell price of the dollar in banks (Kyiv); offic_er — official exchange rate of Hryvnia with respect to USD.

Fig. 1. Exchange rate trend in 2000-2001

We should point out that currency controls have been a feature of both monetary regimes in Ukraine. Hryvnia (except for token amounts) are not allowed outside the country, nor can dollars be taken freely outside the country. Bringing in between \$ 1,000 and \$ 10,000 cash requires a customs report; bringing in more than \$10,000 requires a treasury report stating that the money has been obtained from a legal source. Likewise, to take more than \$ 1,000 out of the country requires one to show the source of the money (e.g., using the customs declaration made

when entering the country). In general, taking more dollars out of the country than one has brought in is not allowed, and the excess dollars can be confiscated. Finally, after the introduction of the hryvnia, the government imposed a severe punishment for using dollars in the official economy — fines equal to several months' wages and/or jail time — in an attempt to 'de-dollarize' the economy.

These currency controls give the NBU considerable ability to keep the exchange rate within its bands. In addition, they also target the shadow

economy, by encouraging people to use bank accounts instead of cash. Finally, they provide a tax revenue source: wire transfers into Ukraine in excess of \$3,000 are taxed at a rate of 20%. Smaller sums are not taxed, but often invite a customs investigation.

Even though Ukraine did not have a Russian-style exchange rate crisis in 1998, it was not able to avoid international payments difficulties of its own. In one notorious episode, the NBU sent an entire IMF installment of \$500 million to offshore banks in Cyprus, an action for which it was later severely reprimanded. The Ministry of Finance had financed its deficits the preceding two years with short-term government debt (T-bills), and in the fall of 1998, the Ministry found itself unable to roll over that debt, even at interest rates 1500 basis points above Frankfurt levels. The resulting liquidity crisis forced the NBU to monetize the debt, driving the hryvnia down sharply against the dollar. Essentially, the NBU used up most of its dollars in reserve during this episode.

Figure 1 shows the behavior of the hryvnia/dollar exchange rate over the past year. Note the wide buy-sell corridor for banks, compared to the narrow corridor for kiosks, both centered around the official rate of the NBU. Notice that the average of buy-sell rates is actually above the official exchange rate. This may explain why the NBU is -\$20 million in dollar currency transactions in the year 2001. The NBU appears to be trying to keep the exchange rate from depreciating too much—and in this it has succeeded. One might call this NBU operation a dirty float.

Such decade-long erosion of value of the local currency provided ample incentive for Ukrainians to hold foreign currency (mainly dollar) bank deposits. Table 1 also gives the dollarization ratio, or the ratio of foreign currency deposits/total deposits over the period 1992 to present. It should be noted that only institutions holding a license to conduct foreign currency operations are allowed to have such accounts. Thus, these figures represent a lower bound on the actual dollar holdings inside the country. Given the potential unreliability of the data, we give two sources, NBU and the Ukrainian-European Policy and Legal Advice Centre (UEPLAC), a think tank set up under TAGIS (or Technical Assistance for the Commonwealth of Independent States) to facilitate the Partnership and Cooperation Agreement between Ukraine and the EU, and in particular economic integration between the two.

The sources are in close to complete agreement on the value of the ratio of foreign currency deposits to total bank deposits, particularly in the period of the managed hryvnia, being never more than one percentage point apart since 1996. Moreover, notice that both series have two peaks, one in 1994 and another in 1999. These peaks correspond to the hyperinflation of the karbovanets period, and the Russian crisis of the hryvnia period, respectively. This makes sense: these two events were the greatest stimuli to holding dollars from a store of value standpoint.

Table 1 also gives the data available on interest rates in Ukraine, again from the NBU. Comparing to the data on inflation, we see that real rates of interest in local currency were negative during the hyperinflation of the karbovanets period, while they are now positive, but small. For the last 3 years, we also have interest rates on foreign currency deposits. These imply that real interest rates on foreign currency accounts are large and positive, although falling. Clearly, foreign currency accounts are attractive from both a store of value and real interest point of view.

Here is something else to notice from the time series on the extent of dollarization. If we compute mean values for the ratio of foreign currency deposits/total deposits from 1992 to 1996 and 1997 to 2001 for each series we have the following:

Monetary Regime I -	38.8 % (UEPLAC)	31.4% (NBU)
1991-1996 (Ruble/Krb)		
Monetary Regime II -	36.5 % (UEPLAC)	34.8% (NBU)
1996-2001 (UAH)		

Although we do not have enough data points for a statistical test, it is somewhat clear from the averages that the percentage of bank accounts in foreign currency has remained substantially the same over the entire period of Ukrainian independence, and this according to both sources.¹ In fact, the NBU figures suggest dollarization has increased since the introduction of the hryvnia. It would be a stretch to claim that we observe this consistency of foreign currency bank deposit holdings solely from store of value motives. In fact, we can claim rather more: that we observe such a consistency also from medium of exchange considerations. To substantiate that claim, we turn to a search-theoretic model of dual currency transactions.

¹ This comparison can be made since the "dollarization" ratio (the ratio of foreign currency deposits to total bank deposits) takes into account changes in exchange rates over time; the NBU uses end of year official exchange rates to convert hryvnia deposits into dollar values; for UEPLAC data, deposits in foreign currency are valued at exchange rates which are annual averages of the official or UICE (Ukrainian International Currency Exchange) rate and the non-commercial inter-bank rate.

3. Search-Theoretic Explanations for Holding Dollars in a Transition Economy

In what follows, we provide some theoretical support for the observed dollarization under both Monetary Regime I and II in Ukraine. Curtis and Waller (2000), henceforth C&W, present a one-country search theoretic model of money where two currencies (domestic and foreign) circulate as media of exchange, despite legal restrictions on the use of foreign currency for internal transactions. In C&W (2000) and the paper to be discussed later, the definition of "internal transactions" is not restrictive - internal transactions can take place in either the legal or shadow economy. Thus, what is illegal is the use of foreign currency in the transaction, not the market in which the transaction takes place. What is appealing about these models of money is that fiat money arises endogenously as a medium of exchange and its general acceptability is determined by underlying parameters of the economy rather than being imposed *ex ante* by the theoretician. In short, unlike money-in-the-utility or cash-in-advance models, money is *essential* and the choice of which currency to use in transactions is endogenously determined rather than being imposed as an *assumption* of the model. Since even intrinsically valueless money can reduce the frictions associated with searching to find a suitable trading partner (i. e., someone who wants what you have to sell and who has what you want to buy simultaneously — a double coincidence of wants), money economizes on those search costs and will thus have value in the market.

C&W study how various currency restrictions (fines in kind and currency confiscation) and the degree of enforcement affects the acceptability of foreign currency and the observed foreign and domestic currency prices of goods. Currency restrictions make the foreign currency "illegal" as a medium of exchange for internal trade. They find that monetary equilibria do exist where both the foreign (illegal) and domestic (legal) currency circulate and are accepted in exchange for goods and services, despite the existence of currency restrictions. This gives support for the observed dollarization in Monetary Regime II.

C&W study two cases — ones in which there is partial or full acceptability of the foreign currency. In the full acceptability model, dollars are accepted in all trades whereas they are not always accepted as payment in the partial acceptability model. The higher is the dollar's acceptability, the more dollarization there is since more trades are being conducted with the dollar relative to the domestic currency.

C&W study a world in which the acceptability of the foreign currency is endogenously determined in order to address the following question. Can the imposition of currency restrictions or stricter enforcement lower the acceptability of the dollar? Surprisingly, C&W show that there are multiple equilibria. In one equilibrium, an increase in the level of enforcement is associated with greater acceptability of the dollar! Consequently, there is a *positive* correlation between the enforcement of currency restrictions and the degree of dollarization! The intuition for this result is as follows. When a seller decides to accept a dollar, he accepts the risk of being punished for conducting an illegal trade or holding an illegal currency. Thus, the seller's *individual* decision to accept the dollar is driven by how easily he can get rid of the dollar (buying from another seller) before getting caught. If the *aggregate* level of acceptability is high, then he can quickly meet a seller who will accept it from him and so he also is more willing to accept it. If there is an exogenous increase in the enforcement of currency restrictions, the value of the dollar as a medium of exchange must rise enough to offset the higher probability of punishment. The dollar's value as a medium of exchange rises if the dollar price of goods falls or there is an increase in the aggregate acceptability of the dollar. Thus, an equilibrium exists in which imposing or increasing enforcement of currency restrictions is associated with greater acceptability of the dollar. This means that the economy can actually become more dollarized even though currency restrictions are more severe.

C&W also show that more severe currency restrictions may simply lead to a relative change in the values of the two currencies rather than an outright disappearance of the dollar from circulation. They demonstrate that the risk of currency confiscation and/or fines proportional to the size of the transaction is not sufficient to de-dollarize the economy; a sufficiently large lump-sum fine is necessary in order to drive the acceptability of illegal currency to zero. For large enough lump-sum fines, conducting small trades using dollars is not optimal and dollars are only used for large transactions. It then follows that for sufficiently large lump-sum fines, even large transactions are too risky and the dollar is driven out of circulation.

C&W also show that for some parameterizations of the model, greater enforcement of currency restrictions may actually cause an appreciation of the dollar relative to the domestic currency due to self-fulfilling beliefs. The intuition here is that a seller must be compensated for accepting a dollar and taking on risk. The compensation can take two forms.

Either the seller can charge a higher price for accepting the dollar (produce fewer goods per dollar) or he can expect to pay lower prices in the future if he uses the dollar. If he rationally expects to pay a lower price in the future (receive more goods for the dollar) then, in a steady-state equilibrium, he is willing also to charge a lower price today when being paid in dollars. It then follows that an increase in enforcement of the currency restrictions can lead to lower dollar prices of goods, which causes it to appreciate in value relative to the domestic currency.

These results lend theoretical support for the observed dollarization in Monetary Regime II in Ukraine, where some degree of dollarization persists at a stable level of GDP despite increased use of legal restrictions on the use of foreign currency in domestic transactions. The theoretical model of C&W shows that imposition of currency restrictions and increased enforcement can actually lead to more dollarization and an increase in the value of the dollar to the domestic currency.

A drawback of the Curtis and Waller (2000) model is that it is a one country, two-currency model. Thus the stock of dollars in the economy is fixed and there is no international trade. In Waller and Curtis (2002), their earlier model is extended to a two-country framework, where two currencies (domestic and foreign) can circulate and currency exchange can occur. In this model, a country is dollarized if multiple currencies circulate as media of exchange. W&C demonstrate that currency restrictions and policies favoring the domestic currency, such as payment of taxes using only domestic currency, can create a "home currency bias" whereby domestic agents value the home currency more than the foreign currency as a medium of exchange for internal trade. They also show that if domestic government policies create an inflation tax on the home currency relative to the dollar, a "foreign currency bias" can arise in which domestic agents value the dollar more than the home currency for internal trade. W&C study the effects of these types of government policies on the equilibrium values of both currencies, currency flows in and out of a country and the real exchange rate.

One result of W&C is that a unique "foreign bias" monetary equilibrium exists in which the government adopts policies that effectively impose an "inflation tax" on the home currency. Because the dollar is taxed at a lower rate, domestic sellers charge a lower price if paid in dollars. This creates incentives for foreigners also to pay for domestic goods using dollars. As a result, there is an inflow of dollars into the economy and dollars begin to be used as a medium of exchange for a large per-

centage of transactions between domestic buyers and sellers.

A similar result is found by Camera, Craig and Waller (2002). In their model, agents hold both currencies and must choose whether to spend the "bad" home currency and hold onto the "good" foreign currency or do the opposite. The inflation tax on the home currency causes domestic currency prices to be high and dollar prices to be low. By spending the "bad" domestic currency, agents avoid the inflation tax but buy and consume less now. Holding onto the dollar enables them to buy more in the future. Thus, agents face an intertemporal consumption choice that determines their currency use. Camera, Craig and Waller show that, for sufficiently high discount rates and trading frictions, as the domestic inflation tax rises, currency substitution occurs and buyers begin to spend dollars rather than domestic currency. As a result, the transaction velocity of the home currency declines while it increases for the dollar. If one is willing to associate a rising transaction velocity with an increase in dollarization, then Camera, Craig and Waller's results are consistent with the view that greater domestic inflation rates are associated with higher dollarization of the economy.

These results help explain the observed pattern of dollarization observed in Ukraine under Monetary Regime I, prior to August 1995, when there were no legal restrictions placed on the use of foreign currency and the country experienced a hyperinflation.

In these models, despite the presence of currency restrictions or government transactions policies, it is relatively difficult to drive the foreign currency from circulation, or "de-dollarize", simply because the foreign and/or illegal currency still serves the purpose of facilitating trade in a decentralized market environment with frictions. This general result obtained from search models of money will also hold when there are alternative assets available for agents to hold. For instance, interest-bearing deposits in domestic currency may also be included in such a model but the availability of such assets will not drive out the use of either the illegal or legal currency, at least for "reasonable" parameterizations. Again, as long as an asset provides a means by which more transactions can occur — to overcome the market search frictions — such assets will have value in equilibrium. By frictions, we usually mean market frictions generated from a lack of double coincidence meetings, but we might think of frictions more broadly. For instance, trade may be hampered by information problems, e.g., it is difficult to find out who is actually selling what you

are looking for or what price is reasonable for the good you want to buy (conveyed through advertising, etc.). In transitional economies, this kind of information is not as easy to come by as it is in a market-oriented economy. Thus we might conclude that trade frictions are much more severe in a transitional economy. Any monetary instrument that might help ease these frictions would endogenously arise and be useful in trade, despite any type of restrictions on its use.

4. Evidence from the Shadow Economy

Even though the dollar became illegal for transactions in Ukraine in 1995, it maintained its role in the shadow economy. The previous section shows us that there exist monetary equilibria where the dollar continues to serve as a medium of exchange illegally, and Ukraine is certainly in such an equilibrium. The obvious place to look for evidence of such an equilibrium is in the shadow economy, and here, Ukraine is among the world leaders. Several studies (reported in Schneider and Enste (2000), which we follow) point to a large and growing shadow economy in Ukraine. The studies reported in Schneider and Enste all use the physical input method, pioneered by Kaufman and Kaliberda (1995), to estimate the size of the shadow economy. For instance, more electricity is measured as *used than is reported as produced* by the power industry. That extra electricity can be imputed to the shadow economy. It reaches the shadow economy either in cash transactions (mostly in dollars) or via complicated barter transactions. The ratio of shadow economy economic activity to official GDP found by this method is striking. Averaging all the values reported in Schneider and Enste's admirable survey results in the following pattern. Just prior to independence, the ratio of shadow economy to official GDP in Ukraine was 16 %. During the period 1990-1993, that ratio rose to 33 %. In the period 1994-1995, it rose still further to 50 %. At that level, one-half of all economic activity in Ukraine takes place in the unreported sector of the economy — making it the biggest single sector. Given the critical role played by the dollar in the shadow economy, this helps account for the continued role played by the dollar in the overall economy.

Other recent estimates by the World Bank and by UEPLAC, using both physical inputs and currency demand approaches, also support the figure of 50 %.

As long as Ukraine has a significant shadow economy, the dollar will remain indispensable to its economic agents. Personal experience is also relevant to this conclusion. Suppose one is in the mar-

ket for a high-end flat in Kyiv, renting for \$1000/month - a figure larger by an order of magnitude than the average monthly wage in Kyiv. Of course, the monthly rent will not be advertised in dollars - that's illegal. The real estate agent will tell you what the real rent is payable in dollars, and if you rent the flat, you sign a contract to that effect. At the same time, you sign a second contract - the official one — for the flat in local currency, say 200 UAH/month. The existence of an official contract lends the entire transaction a veneer of legality, and the landlord pays taxes on the monthly rent in hryvnia. But the lion's share of the economy activity (with these numbers, 95 %) takes place in the shadow economy.

Recall that in February 1993, individuals as well as firms were permitted to acquire licenses to hold foreign currency accounts. One would have expected that the degree of dollarization would have increased, given the new legal status of foreign currency deposits. If the size of the shadow economy shrank overtime, we would expect that Ukrainians would be willing to hold more of their assets in dollar denominated bank deposits, as a means of conducting legal business as well as a store of value in the legal sector. However, dollarization did not increase during that period, both because substantial activity in such accounts would attract unwanted government attention and because of a general level of mistrust on the part of the population toward the banking system itself.

5. Policy Implications of a Dollarized Ukraine

This paper has shown that Ukraine is dollarized to a considerable extent, with dollarization being driven by the inflation in the local currency, exchange rate crises, and the shadow economy. Needless to say, there are policy implications of this situation. The main points we wish to make are the following.

First, until Ukraine makes real progress towards transition, the economy will remain dollarized at its present levels. As the EBRD (2000), the World Bank and other agencies have pointed out; progress towards transition in Ukraine is stalled. The level of corruption remains quite high, as measured by the intransparency of government decision-making. Indeed, with a Transparency International ranking of 72, Ukraine ranks in the bottom quartile of all countries. As the EBRD makes clear, this stalled progress is reflected in a large shadow economy, with the dollar playing a major role in the shadows.

Second, real progress towards transition requires a government with an orientation towards Europe

- and that government orientation does not currently exist to an appreciable extent. Although the Ukrainian ambassador to the United States can be heard calling for Ukraine's "integration into Euro-Atlantic economic and security structures", similar calls are rarely heard inside Ukraine. The only reform-minded Prime Minister of the decade of independence, one committed to closer ties to the EU, V. Yushenko, was voted out of office by the coalition of Communists and Oligarchs that dominate the Ukrainian Parliament at present. Following the path of Poland to EU is an impossible sell, given the political constellation of forces inside Ukraine.

Third, notice that exports and imports are denominated in dollars (NBU website), even though the U.S. is a small trade partner and direct investor in Ukraine. The EU is a much larger trade partner and direct investor, and this has spurred calls for even greater economic integration between the EU and Ukraine (Krause, 2001). But even the EU numbers pale beside those of Russia: Russia is by far Ukraine's largest single trade partner and source of direct foreign investment. Indeed, one reason that the trade accounts are denominated in dollars is that both the hryvnia and ruble are weak currencies, and play no role in trade between the partners. The trade that does occur is done either by barter or with dollars. The trade relationship with Russia testifies to the enduring explanatory power of the gravity equation in international trade (Gros and Steinherr, 2004). Indeed, one could argue that there exists an optimal currency area comprising Russia, Belarus, and Ukraine — and that the optimal strategy for Ukraine is to join such a reconstituted Russian-ruble zone. However, this scenario also lacks local political appeal — even Ukraine's Communist Party is divided on its merits. For the political forces supporting reform, anything that smacks of recruiting the Soviet Union in another guise is a non-starter.

Fourth, even as we write, the euro is about to replace the German mark permanently. The German mark has played a tertiary role in the Ukrainian economy, behind that of the dollar and ruble. From the standpoint of search theory, only one good alternative to the local currency is needed to maintain the equilibrium with dollarization. Under current conditions, that currency is the dollar. Still, one might expect more than a mere replacement role for the euro in the future scheme of things. Thus, Gros and Steinherr (2004) call for official euroization throughout the Balkans, and by impli-

cation, in the rest of Eastern Europe. Certainly, for candidates for EU membership in the coming enlargement, the euro looms large in their future. The position of the European Central Bank is clear: it would like to partner with the NBU to align more closely monetary events in Ukraine with those of the European Monetary Union (EMU) (Thimann, 2001). As Thimann says, "The ongoing enlargement process will bring the EMU to Ukraine's doorstep and make the Euro-area its largest trading partner... Even though these developments still lie well in the future, it may be worthwhile to take them into consideration for Ukraine's future development and integration with Western and Central Europe. The European Central Bank stands ready to assist this process now". Thus, Ukraine, while on no list for EU membership for the foreseeable future, may nevertheless prove to be a good candidate for euroization, with a big assist from the ECB.

It is conceivable that Ukraine could become more tied to the EU regional supply chain in the future. If so, it will be doing more of its contracts and business in euro. One possibility, far from remote, is a customs union between Ukraine and the EU, along the lines of the customs union between Turkey and the EU. Interestingly, the gains from such a customs union for Ukraine appear at best miniscule, and at worst, nonexistent according to recent (albeit preliminary) estimates (Harbuzyuk, 2001). If so, and considering the lack of enthusiasm within the EU Commission for such a customs union, we do not expect this scenario to be played out at present. Nevertheless, the situation inside the EU Commission could change abruptly — witness the latest Big Bang recommendation on EU enlargement — and the fundamentals supporting deeper trade ties between the EU and Ukraine could improve sharply in the medium run (Krause, 2001).

Suppose that Ukraine does eventually get on the road to Europe, as Poland has done in the last decade. That means transition to a functioning market economy and stable democracy, hallmarks of eligibility for EU membership. This would entail as a corollary development, increase in transparency, decrease in corruption, and contraction of the shadow economy. In this event, unlikely but possible, and given the stance of the ECB, we would expect to see the euro gradually replace the dollar in a euroized Ukraine. In that case, euroization would actually symbolize, as well as actualize, the process of joining Europe. But such a process is many years away, if it ever takes place at all.

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ДОЛАРИЗАЦІЯ У СПІВДРУЖНОСТІ НЕЗАЛЕЖНИХ ДЕРЖАВ (СНД): ПРИКЛАД УКРАЇНИ

Економіка України так само, як і багато трансформаційних ринкових економік, є частково доларизованою — фактично увесь період незалежності характеризується значною доларизацією. І хоча Україна була свідком двох різних монетарних режимів протягом періоду незалежності, ступінь доларизації, здається, майже не змінився за цей час, що ускладнює ситуацію. Запропоновано пояснення цього феномену, підкреслено важливу роль, яку відіграє тіньова економіка в Україні. Обговорено можливі висновки щодо доларизації та євроізації України у майбутньому.