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## Can parental migration reduce petty corruption in education?

*Lisa Sofie Höckel, Manuel Santos Silva, Tobias Stöhr*

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**Abstract:** The income generated from parental migration can increase funds available for children's education. In countries where informal payments to teachers are common migration could therefore increase petty corruption in education. To test this hypothesis, we investigate the effect of migration on educational inputs. We use an instrumental variables approach on survey data and matched administrative records from the World Bank's Open Budget Initiative (BOOST) from Moldova, one of the countries with the highest emigration rates. Contrary to the positive income effect, we find that the strongest migration-related response in private education expenditure is a substantial decrease in informal payments to public school teachers. Any positive income effect due to migration must hence be overcompensated by some payment-reducing effects. We discuss a number of potential explanations at the family level, school level or community level. We furthermore rule out several of these explanations and highlight possible interpretations for future research.

**JEL-Classification:** F22, I22, H52, D13.

**Keywords:** migration, emigration, corruption, education spending, social remittances.

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Emigration has long been considered detrimental to origin countries' human capital due to the loss of skilled workers. However, positive effects are possible either through the brain gain mechanism (Mountford, 1997) or due to a positive income effect increasing households' inputs in education.<sup>1</sup> That positive income effect could in theory also increase spending on a particularly corrosive education input – informal payments to teachers. Such payments are common in many developing countries and have also become widespread in post-Soviet countries after the collapse of the USSR as real wages for teachers declined abruptly. This paper shows that the positive income effect can be overcompensated by other effects leading to an overall decrease in informal payments to teachers due to parental migration.

These informal payments are problematic for two main reasons. First, they impose a “tax” on education that may reduce the incentives to human capital accumulation. Second, they distort performance incentives for teachers, parents, and students, for example, by motivating teachers to provide exam results to students instead of teaching them in line with the curriculum. Thus, informal payments are understood to contribute to a less functional and less egalitarian public education system.<sup>2</sup> Often, they are raised by informal parental committees on a per capita basis and tend to be regressive. Parts of the raised funds are spent on maintenance of the school and a large part will supplement wages of teachers. These payments have many organizational similarities to weakly enforced per capita taxes, a fact that can help tailor responses to them. The second and even more problematic form of payments to teachers is competition for higher grades or better treatment of individual students. Here, migrants can be expected to spend more money per child due to an income effect. These bribes are especially common in higher education (ESP/NEPC, 2010).

We study the effect of migration on informal payments and other forms of private educational expenditure and control for self-selection into migration by employing an instrumental variable approach. Our instrument is a network-based pull-effect at the local level, which is constructed using past migrant shares and destination-specific economic growth over time. The identifying assumption is that this network-growth interaction provides exogenous variation in the *ex-ante* costs and returns to migration, but does not

otherwise affect the household's educational investment decision.

Our paper is, to our knowledge, the first to document a negative causal effect of parental migration on such informal payments to teachers. We show that the reduction in petty corruption occurs even though migrant households are, on average, wealthier than their non-migrant counterparts. This suggests that the income effect is overcompensated by other channels. School-level variation indicates strong spillovers within schools, that could partly be due to social remittances, i.e., migrants affecting the opinions of those left behind, and partly due to migrant families' behavior leading to a breakdown of the social norm of taking part in petty corruption. The results are neither explained by differences in public school funding nor by differences in the share of migrant children across schools. The money saved on informal payments to teachers does not translate into higher spending on out-of-school tutoring (henceforth: tutoring), which is an alternative way of teachers to make up for lost informal wage supplements. Rather, we find some evidence that main caregivers allocate more time to educational and school-related activities in migrant households. The reduction in informal payments might be explained by access to information or value change due to migration – a literature which finds that the migration experience can alter migrants' and their left behind families' political values, social norms, and behavior in general.<sup>3</sup> Since the underlying preferences and beliefs about the spread of corruption are unobserved, this remains a tentative hypothesis. We are however able to rule out several alternative explanations: income-effects, the valuation of education, non-parental caregivers, and several supply side factors, which we measure using matched school budget data, community level data as well as additional parts of the survey.

The remainder of the paper proceeds as follows. Section I anchors the paper in the literature. Section II provides information on Moldova and corruption in education. Section III describes the data used and section IV presents our empirical strategy. The main results are presented in section V. Section VI tests alternative explanations and the robustness of the main results before section VII concludes.

## *I* RELATED LITERATURE

Especially in developing countries, individual migration can be beneficial for children's education by raising and diversifying overall household income and alleviating credit constraints (Adams and Page, 2005; Calero et al., 2009). However, parental migration can prove detrimental to children's educational achievement. First, parental absence can cause emotional distress jeopardizing school outcomes of children, especially if mothers or both parents are absent (e.g., Zhang et al., 2014; Cortes, 2015). Second, children could substitute for the absent migrant in household chores or even paid work (McKenzie and Rapoport, 2010; Antman, 2011). Third, parental migration might drastically reduce the educational input of the migrant's time. Crucially, parents could try to make up for such negative effects by paying teachers informally to give their children extra attention or even bribe them for better grades. In addition, we expect caregivers' time allocation to adjust when family members migrate. The income effect could also decrease time allocated to children by remaining adults. However, parents often cite improving the lives of their children as the most important motive for migration. Therefore, we expect them to treat time spent with their child for educational activities as a normal or even a luxury good. Thus, parents would invest more time if remittances allow them to work less. Hence, instead of consuming more leisure we expect the remaining caregiver to increase education inputs.

In addition to affecting the budget constraint, migration can affect households' educational investment more fundamentally. The preferences and views of immigrants are known to change through acculturation, personal experience and the exposure to new ideas, knowledge and institutions (Berry, 1997; Careja and Emmenegger, 2012). For example, the values of immigrants living in Western societies are found to converge to those of the host population over time. Such changed values can have a lasting effect when migrants return to their country of origin (Spilimbergo, 2009; Batista and Vicente, 2011).<sup>4</sup> These effects are not confined to return migration but can also be transmitted through communication with family or friends. Chauvet and Mercier (2014) find spillover effects from the migrant to the non-migrant population in terms of participation and electoral compet-

itiveness. Barsbai et al. (forthcoming) provide evidence that emigration from Moldova, the country studied in this paper, changed political attitudes and may have lost the incumbent Communist government the 2009 elections. As the authors discuss, Moldova had very little exposure to the outside world before migration took off. In such settings where information is scarce, diffusion processes are likely to be influential. As petty corruption is often found to be dependent on the societal belief that it is widespread (Corbacho et al., 2016; Dong et al., 2012), migration might broaden the horizon and thus decrease its likelihood by showing migrants that school systems can work without informal payments. In particular, payment schemes that depend on public-good-style contributions may dissolve if a few individuals cease contributing (Fehr and Gächter, 2000).

## **II MOLDOVA AND CORRUPTION IN EDUCATION**

Moldova is the poorest country in Europe with an estimated GDP per capita (PPP-adjusted) of \$4,521 (World Bank, 2014).<sup>5</sup> The potential effects of migration and societal spill-overs are therefore particularly visible in a country like Moldova because it is the country with the third highest remittance to GDP ratio (24.9%), only surpassed by the Kyrgyz Republic and Nepal (World Bank, 2014). In comparison, other commonly studied economies like Mexico (remittances to GDP ratio of 2%) or the Philippines (9.8%) are considerably less dependent on remittances. Another advantage is that migration has been a relatively recent phenomenon. After the dissolution of the Soviet Union in 1991, some Moldovans continued working in what is now Ukraine and Russia and were thus suddenly called international migrants. Mass migration, however, only started when the Russian financial crisis of 1998 hit and increased unemployment and poverty considerably in Moldova. In 2011, emigrants made up 17% of the total population (MPC, 2013), which means that 30-40% of children, depending on the sample, are affected by emigration of at least one parent.<sup>6</sup>

As a former member of the Soviet Union, Moldova's public educational system has good coverage (even in rural areas) with enrollment rates of nearly 100% for primary and lower secondary schooling and 87% for upper secondary schooling (Table S.1 in

the supplemental appendix, available at <http://wber.oxfordjournals.org/>). Attendance is formally free of charge from first grade up to high school completion<sup>7</sup> and below tertiary education there are few private schools.

There is a steep socio-economic gradient in educational achievement (Walker, 2011) which some worry might increase due to migration, not least due to widespread informal (and often illegal) payments to schoolteachers and other officials. The institutional causes of these are twofold: teachers' wages are low and often delayed and, socially, there is public tolerance of corruption and insufficient critical input of mass media. According to the 2013 Global Corruption Barometer, 37% of households in Moldova that came into contact with education authorities paid bribes in the 12 months before the survey and 58% of respondents perceived the education system to be corrupt or highly corrupt (Transparency International, 2013). Similarly, in the 2011 Citizen Report Card study, corruption is cited to be the most common difficulty when requiring services from public educational institutions and paying bribes is the second most common way of solving problems after insistence, joint with using personal contacts. Another form of corruption in the education system is the acquisition of unnecessary tutoring from a child's teacher (Carasciuc, 2001). This means that tutoring is often in a gray area between a productive investment in students' cognitive achievement and paying teachers informally. Besides seeking individual gains for one's own child, there is an important social component to making illicit payments to teachers resulting from the interaction of parents, teachers, and school principals (ESP/NEPC, 2010).<sup>8</sup>

The less frowned upon kind of these payments are monetary transfers or in-kind "gifts" that are often collected by informal parental committees. Typically they either supplement teachers' wages or finance maintenance spending in schools. These expenditures face some of the organizational issues of public goods, including committees dissolving and payments stopping once the number of parents who are willing to contribute declines. There are only relatively blunt mechanisms to enforce payment, for example parents being excluded from the committee and teachers ignoring children in class. While payments can be seen as necessary to motivate teachers, there are widespread detrimental consequences such as especially motivated teachers providing solutions to (standardized) exams, a prac-

tice that clearly undermines the education system.<sup>9</sup> Furthermore, monetary transfers that are imposed on a per capita basis might also affect poor households disproportionately since they have to pay a higher share of their income (Emran et al., 2013).

The form of corruption in schools that is locally perceived as most problematic is direct bribing with the purpose of increasing the attention or grades a teacher gives to an individual student at the expense of others. Furthermore, bribes can be necessary to gain access to the best public high schools and to universities.<sup>10</sup>

In sum, while payments to teachers are in part motivated by grade-buying or seeking better treatment for the child, a larger share seems to operate as a per capita tax. In the latter case, the extent and magnitude of informal payments is more likely to be determined by local norms, the preferences and the bargaining power of teachers, parents, and school officials, and less by the pursuit of inflated grades or preferential treatment for the child. Both kinds of petty corruption however can be expected to affect incentives negatively, increase the socio-economic gradient in educational outcomes and contribute to a social climate where corruption is an everyday experience.

### **III DATA AND DESCRIPTIVES**

In this section, we discuss the data and present key descriptive statistics of our sample.

#### ***Data***

We use data from a nationally representative household survey conducted in Moldova in 2011-12 (henceforth abbreviated CELB 2012) which was specifically designed to investigate the effects of migration on children and elderly left behind. The survey includes 3,568 household with 12,333 individuals, of which 2,501 are children of age 6-18.<sup>11</sup> In addition to socio-economic characteristics of household members, detailed information on private financial and non-financial inputs into children's education was collected by identifying and interviewing each child's main caregiver.<sup>12</sup> Financial expenditures include payments and other "gifts" to schoolteachers, tutoring expenditures, and transportation expenditures that we will use as different dependent variables in the analysis.<sup>13</sup> Non-



financial inputs include how often the main caregiver helps the child with homework and other school activities in the month prior to the survey interview on a six point scale ranging from “never” to “every day”. In addition to the household survey, community questionnaires were filled out by local officials, typically in the mayoral office. Finally, we match data from the World Bank’s open budget initiative (BOOST) to provide school-level data on public education expenses in the respective communities and schools (see appendix S.1 for more details). Our baseline sample consists of 2,148 children from 1,448 households.

### *Descriptive Statistics*

A migrant household is defined by the existence of at least one adult who, in the 12 months prior to the survey, has spent a minimum of three months living abroad. In our sample 29% of children live in a migrant household (Table 1).<sup>14</sup> The average student from migrant households is 12.6 years old, 5 months more than her non-migrant peer. Before accounting for selection into migration, the average grade (GPA) is 0.06 points higher for children in migrant households. Migrant families are slightly larger on average and more likely to come from rural areas. Despite this, their average total income and average per capita income are significantly higher than those of non-migrants.<sup>15</sup> Figure 1 also reflects the underlying effect of migration, showing no difference in assets in 1999 but significantly higher assets for migrant families in 2011.<sup>16</sup>

[Table 1 and Figure 1 about here.]

Households in our sample report positive payments to teachers for about 37% of all school-age children.<sup>17</sup> Payments to teachers typically vary from 5 to 40 USD per child per year, which is substantial given that public expenditure for teaching materials per pupil is about 30 USD per year and wage bills per pupil are about 300 USD per year (c.f. appendix S.1 and Table S.2). In contrast, households only report tutoring expenses for approximately 10% of children (c.f. Figure S.1). Despite higher income both per child informal payments to teachers and tutoring expenses are significantly lower in migrant households compared to non-migrant ones. For transportation expenditure there is no

such difference. The differences in informal payments and tutoring are mostly driven by more migrant households reporting zero payments (not refusals or “don’t know” answers) rather than by smaller positive expenses. This is not only evident at the individual level, but also results in a strong negative correlation at the community-level between the share of migrant households and the share of respondents reporting payments to teachers (Table 2: Panel A, column 1).<sup>18</sup> The slope of the regression line is approximately -0.4, a very high value that is statistically and economically significant. Note, though, that our data are designed to be representative at the national but not at the community level. The negative correlation also holds at the individual level (Table 2: Panel A, column 2-5).

[Table 2 about here.]

#### *IV Empirical Strategy*

To analyze whether this strong negative correlation between migration and petty corruption at the community-level as well as the individual level is indeed closely tied to migration, we estimate the stylized model:

$$y_{ihcs} = \alpha + \delta \text{Mig}_{hc} + X'_{ihcs} \beta + \epsilon_{ihcs} \quad (1)$$

where  $y_{ihcs}$  are private inputs to the education of child  $i$  in household  $h$  from community  $c$  and school  $s$ . We consider three financial inputs (informal payments to teachers, tutoring, and transport expenditures) and two non-financial inputs, if the child is enrolled in school and the frequency with which the caregiver spends time supporting the child in educational activities. The main explanatory variable of interest,  $\text{Mig}_{hc}$  is a household-level dummy variable taking the value one if the child lives in a migrant household and zero otherwise;  $X_{ihcs}$  is a vector of child- and household-level control variables; and  $\epsilon_{ihcs}$  is the error term.

Clearly, migrants are not a random population group but rather self-select into migration. Thus, it can be expected that they systematically exhibit distinct unobservable characteristics relative to non-migrants that might bias OLS estimates of equation (1). To overcome this problem, we estimate an instrumental variable approach by two-stage least

squares (2SLS).<sup>19</sup> Our instrument for migration status is the interaction between preexisting migration networks at the local-level and destination-specific economic conditions. Formally, we use the growth rate of per capita GDP for each destination country between 2004-2010 and weight it with the share of migrants that, by 2004, had migrated from the community to that destination.<sup>20</sup> The data for the migrant-destination share at the community level are derived from the 2004 Moldovan Census.<sup>21</sup> The variable has already been employed as an instrument for migration in other studies of the Moldovan context (e.g. Lücke et al., 2012; Böhme et al., 2015). The rationale behind the use of *Network-Growth* is twofold. First, migrant networks are known to be very important in facilitating *current* migration. The network can provide *ex ante* information and assistance and *ex post* support for the migrant upon arrival (e.g., short-term accommodation, job-searching expertise, paperwork). Thus, pre-existent migrant networks effectively reduce the costs of migration (e.g., McKenzie and Rapoport, 2010). Secondly, the growth of GDP per capita at the destination is a proxy for the country's economic performance and, more importantly, employment conditions that are exogenous to potential migrants in Moldova. An expanding job market is highly attractive for potential migrants and hence a pull factor to this destination (e.g., Antman, 2011).<sup>22</sup> As a whole, our instrument captures the exogenous variation of migrant networks at the community level – which lowers migration costs – and economic conditions at the destination country – which increase the expected returns of migration. Exploiting variation at the community level, our instrument does not allow exogenizing household level choices regarding migration such as the identity of the migrant or the duration of the stay abroad. We can only successfully predict the probability of at least one household member becoming a migrant and therefore use the household's migration status as the main variable of interest in our analysis. Therefore, our results should be interpreted as the average effects across all migrants and migratory spells. The validity of the instrument depends on the exclusion restriction that *Network-Growth* must only affect the provision of private educational inputs through migration status. This seems self-evident for the growth of GDP per capita at the destination. It is hard to conceive of a different relationship (i.e., other than migration) through which the changes in per capita growth rates in a set of foreign countries would affect the educa-

tion investment decisions of a Moldovan household differentially between communities. For the migration network, we assume that past migration rates are predictors of current migration rates only via network effects and, otherwise, have no influence on the household's education spending. Accordingly, we include the 2004 share of the community's population who is a migrant to Italy, Romania, Russia and Ukraine as additional controls in the 2SLS setup to account for proximity to the border and any systematic differences in development that may have arisen because of migration to any of these important destinations between the take-off of migration, in 1999, and 2004, as in Böhme et al. (2015).<sup>23</sup> The IV is not systematically correlated with school expenditures, local economic conditions as proxied by night lights (Henderson et al., 2012), local infrastructure or public goods as reported in the community questionnaire. Further, communities with IV values above and below median values are distributed evenly across the country (Figure S.3). Summary statistics for the IV variable can be found at the bottom of Table 1.

## V MAIN RESULTS

The dependent variables of our empirical analysis are the child's school enrollment status, the three categories of private education spending – payments to teachers, tutoring expenses, transportation expenses – and the time spent by the caregiver. The reduced form estimates are reported in Table 2, Panel B. The lack of a selection correction results in a statistically significant correlation between the instrument and school enrollment<sup>24</sup>, which indicates better migration options for those who leave school after the end of compulsory schooling. Correlations between the instrument and payments to teachers, as well as tutoring expenses, are negative and statistically significant.<sup>25</sup>

The first stage IV estimates are reported in Panel C of Table 2. The *Network-Growth-IV* is a positive and highly significant predictor of the household's migration status. The instrument's estimated coefficient implies that a one standard deviation increase in *Network-Growth* increases the likelihood of (at least one) household adult member migrating by approximately 14 percentage points. The Kleibergen-Paap rank test rejects underidentification at least at the 5% significance level in all the 2SLS regressions.

The second stage indicates no statistically significant effect of migration on the enrollment probability (column 1) as a result of parental migration. Instead, the results indicate a strong reduction in the likelihood to pay teachers conditional on individual characteristics that is even more pronounced than the negative correlation in panel A (column 3). For tutoring we see a similar negative effect whereas transport expenditure remains unchanged (columns 5 and 7). Interestingly, the determinants of tutoring are similar to those of paying bribes, supporting the view that tutoring offers a “cleaner” way of making informal payments to teachers. There is some evidence of caregivers more frequently spending time on the education of their children (column 8). In order to account for potentially inflated point estimates due to weak IVs, we provide the conditional likelihood ratio (CLR) confidence region and cluster robust confidence sets for the respective migration effect at the bottom of the table (Moreira, 2009; Mikusheva and Poi, 2006; Finlay and Magnusson, 2009). Both methods show that the effect of migration on informal payments is bounded away from zero even when accounting for weak IVs.<sup>26</sup> The results point to a statistically as well as economically significant negative effect of migration on informal payments.<sup>27</sup>

The very strong negative correlation, even after rigorously accounting for self-selection, cannot be the consequence of a mere income effect. At the same time, children’s or parents’ socio-economic characteristics do not predict petty corruption at the extensive margin very well. While there is more reporting of payments for older students, girls, and by more educated parents – one of the core predictors of income – the other controls are statistically insignificant. Additional analyses yield no evidence of heterogeneous treatment effects by age, yet this is partly be due to imprecise estimates in small subsamples (Table S.8).

Our main results are not explained by differences in household wealth (proxied by a household asset index, Table 3). Contemporaneous assets are endogenous to migration and, in fact, constitute one of the main expected transmission channels of migration on education inputs (column 1 and 3). Pre-migration differences in wealth across households (columns 2 and 4) should not and do not have any impact on the second stage migration coefficient. To sum up, our finding on bribes can neither be explained by wealth differences across migrant and non-migrant households nor by the income effect of remittances.

[Table 3 about here.]

Regardless of this, the income effect of migration matters by improving families' ability to keep children in school. Whereas over 50% of non-migrant parents report barriers that will prevent the child from achieving the caregiver's desired level of education this is the case only for 35% of migrant parents (Table S.9: Panel A). The modal reason, a lack of finances, is cited by over 80% of caregivers in either group. Migration reduces barriers in general and financial barriers in particular (Table S.9: Panel B). The income effect in education is thus strong, in stark contrast with its effect on petty corruption.

As a supporting *ad hoc* assessment of the mechanism, log remittances received by the household can be used in place of the migration dummy as the endogenous variable (results available on request). In this case, no more significant correlation between the endogenous variable and informal payment is found in the second stage, which may be taken as tentative evidence that variation from the instrument does not affect bribe paying through the remittance channel. Even though one has to be careful interpreting such evidence because it is no longer a valid IV approach, this may be interpreted as suggesting that instead of remittances other aspects of migration are likely to be the source of the bribe reducing effect. In line with other research one might hypothesize that the negative coefficient of migration is explained by a lower willingness to bribe officials in the education system. This could be due to former migrants' own likelihood of bribing teachers or through social remittances (c.f. Ivlevs and King, 2014; Barsbai et al., forthcoming). Irrespectively of whether it is the migrants themselves or their families who decrease bribe paying, our finding is promising from a normative point of view. From an economic standpoint, the money not given to teachers as informal "service fees" or "presents", i.e. for rent-seeking, could be used more productively on other household expenses and would stop distorting incentives for teachers and students. The emerging picture is thus a reduction in bribes and a simultaneous increase in the frequency of parental involvement in children's education due to migration. In the next section possible transmission channels will be discussed in more detail.

## VI TRANSMISSION CHANNELS AND ROBUSTNESS

According to the community leaders interviewed in the survey, the most widely perceived constraint to school quality is not a scarcity of staff but of other inputs, such as teaching materials or utilities (Table S.10). Parental education inputs could be affected by the public funding situation of local schools, causing omitted variable bias.<sup>28</sup> Thus, we match our household data with administrative school-level expenditure data from an open budget initiative of the World Bank (BOOST) to ensure that the instrument is not picking up community level variation in the supply of public education. Matching both datasets is imperfect because the availability of the budget data was not anticipated at the time of the household survey (see appendix S.1 for a detailed description of the data and matching procedure). We include the school-level executed budget in several expenditure categories as additional explanatory variables.<sup>29</sup> The strong negative effect on bribes remains even after adding the additional controls, which approximately halves the sample size.<sup>30</sup> Schools' wage bills, which closely correspond to the schoolteachers-per-pupil ratio (c.f. Figure S.4), teaching material and schools' maintenance funds are not significantly correlated with household educational expenditures (Table S.11: columns 1-6). By contrast, schools' expenditures on utilities and transports, where community leaders often report lacking funds, exhibit signs of substitutability of private and public expenditure. There is also some tentative evidence of substitution between the parental investment of time and the time teachers could allocate to individual children (column 7).<sup>31</sup>

[Table 4 about here.]

The strong correlation between migration and informal payments to teachers is also robust when controlling for an index of infrastructural quality of the school (Table 4: column 1). We furthermore tested whether the migration-induced reduction in informal payments is lower in worse funded schools where informal payments may be less controversial but did not find any robust differences (results available upon request). Sending students to schools with funding for school buses and attending a more distant school, both of which proxy secondary and advanced secondary schools that cover larger areas, correlate positively (although statistically insignificantly) with informal payments. Using

school fixed effect regressions to compare students within schools, we find that better off parents pay more to teachers and buy more tutoring from their children's teachers (Table 4: columns 3 and 4).<sup>32</sup> This underscores the importance of the income effect. The migration coefficient is negative but insignificant, suggesting that much of the variation associated with migration occurs at the school level. This fits well our discussions with Moldovan experts, who stated that the payments to teachers that are collected by informal parental committees can quickly stop completely once a few parents refuse to pay them – an effect that often occurs in public good settings if punishment is weak (c.f. Fehr and Gächter, 2000). In line with our expert discussions, we thus interpret the migration effects as quickly spilling over within schools.<sup>33</sup>

To ensure that our results are not driven by local heterogeneity across communities rather than migration, we add a within-community dimension to the original IV's community-level variation. We interact the network-growth IV with the household's mean years of education since more educated households can be expected to be better able to respond to the growth-pull mechanism approximated by our IV. The new variable is positively related with migration and statistically significant at the 1% level. The estimated effect of migration on payments to teachers is almost identical to our main estimates (Table S.13).

Two motivations for ceasing bribe-paying are plausible: 1) migrant parents being generally less tolerant of corruption due to their experience abroad and 2) migrant parents demanding actual cognitive achievement instead of good grades because they have witnessed the unimportance of Moldovan certificates relative to actual skills for success abroad. A full 96% of caregivers replied that education was important to be successful abroad. Yet, there is no significant reduction in the perceived quality of children's individual schools (Table S.14).<sup>34</sup> This gives us confidence that our results are not driven by differences in the cost-benefit analysis of the Moldovan school system between non-migrant and migrant households.

In order to provide some evidence of robustness as well as external validity of our study, we draw on another, less detailed dataset to show that a similar negative correlation of migration and bribe paying exists also in data independent of ours. The so called



*Barometer of Public Opinion* of Moldova's Institute for Public Policy, a well-regarded biannual survey which collects individuals' opinions on a wide range of topics regarding politics, values, and related issues in Moldova covered informal payments to authorities and migration status in the April 2013 survey.<sup>35</sup> Those individuals with migration experience to the West were more likely to have had contact with the justice system and were more likely to have been asked for bribes for the solution of their problem. Conditional on reporting *not* paying a bribe, people with any experience of migrating and especially the typically more wealthy migrants to the West were more likely to have been asked to pay informal fees than those without migration experience (odds ratio: 3.6 times). Individuals with migration experience thus seem to be less likely to pay bribes under a given level of pressure to do so.<sup>36</sup>

Finally, our results could be driven by the migration-induced change in the identity of the child's caregiver, for example, reflecting that non-parental caregivers (e.g., grandparents, siblings, aunts or uncles) have less involvement in (or knowledge of) the education system and are, therefore, less likely to bribe teachers. They may also have lower opportunity costs of time and may therefore spend more time on the child's education. To rule out this mechanism we re-estimate the main results while excluding all children with caregivers who are not one of their biological parents (Table S.15). The slightly but not significantly larger coefficients of migration provide strong evidence that our results are not driven by caregiver change. Our results are furthermore robust to alternative but similar definitions of the migration dummy (e.g., who migrates or how long migration spells have to be). We also find no evidence that our effect is driven by caregivers who are return migrants.<sup>37</sup> More generally, including a dummy variable for return migrant households (i.e., those households with at least one return migrant but *no* current migrants) does not affect the migration coefficient in our educational input IV regressions. Return migration itself has a negative coefficient which is smaller in absolute magnitude than the (current) migration estimate, but statistically insignificant (available upon request). Note that correcting for self-selection into return migration lies beyond the scope of this paper.

Despite controlling for households' mean years of education in all regressions, it could still be possible that households were sorted on unobserved ability within Moldova. In

that case, the size of the 2004 network could be correlated with families' unobservable skills. In the Moldovan context, this hypothesis is very unlikely. In Soviet times, internal migration was highly restricted and centralized. High skilled individuals were not only concentrated in the main cities, where tertiary education was available, but were often deployed as state bureaucrats to agricultural or industrial projects all over the country, especially the countryside. After the collapse of the Soviet Union, there has not been much internal migration. To corroborate our arguments, we re-run our main specifications excluding children living in the two cities, Chişinău and Bălţi, that exert the main pull effect internally. Our results remain fully robust throughout (available upon request).

As seen above, our main results are robust to a host of alternative explanations. If not paying bribes however had dire consequences for the children's educational performance, lower corruption might not be in their best interest. We therefore estimate the effects of migration on students' grade point average (GPA) (Table S.16). Throughout the different specifications payments to teachers remain insignificant. In addition, and in line with the literature, we find a negative correlation between migration and the GPA that is partly compensated by household wealth. This underlines that most of the informal payments may not be directly meant to improve grades relative to classmates but rather operate as illicit user fees or per capita taxes. If their payment ceases, students on average do not suffer worse grades. However, students who, relative to their classmates, receive extra attention from teachers due to tutoring (which are partly mere bribes), do better grade-wise. Also, many Moldovans suggest that bribing of teachers for grades is not effective anyway because students study less hard if they expect to receive higher scores. Another possibility is that deviating from the common situation of paying bribes has no adverse effects, especially as standardized tests are increasingly used in the most important exams with the deliberate aim of fighting corruption in education.

## **VII CONCLUSION**

In this paper we analyze the effect of emigration on petty corruption in education, in particular on informal payments to teachers. Such payments are typically understood to

have a dual motivation: fund raising for maintenance of schools as well as supplementing teachers' wages to increase their motivation and/or to focus their attention on individual children. We use the interaction between migrant networks and economic growth at the destination as an instrumental variable for the household's migration status in order to control for selection into migration. Using this IV approach, we document a reduction in informal payments to teachers. This aggregate migration effect consists, among others, of a non-negative income effect that is counteracted by other factors. By excluding alternative explanations, and in line with an emergent literature, we speculate that the widening of migrants' horizon (i.e., additional information or value change) may be the main driver of the reduction in petty corruption.

Incorporating school level budget data in our analysis, we show that there is no strong correlation between public school funding and petty corruption. Thus, the most socially accepted justification for informal payments to teachers – the need for school maintenance and wage supplements for motivation – is not a good predictor of differences between schools. Within schools, additional analysis suggests that reductions in payments to teachers quickly spill over to non-migrants. This is in line with qualitative evidence according to which per capita payments to teachers cease once a few parents in a class refuse to pay due to only weak enforcement devices in the hands of teachers or other paying parents. Our results fit with novel research that shows how participation in corruption often depends on people perceiving it as widespread. This is a prevalent phenomenon in low and middle income countries. In such a setting simply increasing teachers' salaries and school resources might decrease the perceived legitimacy of informal payments. If budget constraints made this impossible and these payments continued to exist, structures such as teacher-parent-committees should formalize them as donations. The available funds should then be focused on making teachers wages sufficient while stepping up enforcement of laws against individual corruption. This way, transparency and accountability would be improved while providing solutions for underfunding that do not distort incentives. Both the opportunity to siphon off part of the payments for private use and the necessity to do so would thus decrease. For bribes which are used to get the own child ahead of the competition, other measures are likely to be more effective. In a bold move,

the Moldovan government recently introduced video-taping of the most important high school exam to put an end to teachers, motivated by informal payments, telling answers to their classes or, worse, individual students. As such laudable reforms reduce the scope for corruption they may also make it easier for both migrants and non-migrants to resist corruption. Focusing reform efforts on increasing awareness that petty corruption in education is a problem, stoking demand for educational achievement rather than for good grades, and creating incentives to deviate from the social norm of participating in petty corruption hold promise. This paper thus provides evidence of a petty corruption channel through which the all too often forgotten positive effects of emigration on origin countries can arise. Future work should seek to more clearly disentangle how such effects occur and what role the institutional and social contexts play.

## *Notes*

<sup>1</sup>E.g., McKenzie and Rapoport (2010); Antman (2011, 2012); Calero et al. (2009); Yang (2008); Bansak and Chezum (2009); Cortes (2015).

<sup>2</sup>E.g., ESP/NEPC (2010); Heyneman et al. (2008); Osipian (2009)

<sup>3</sup>For examples, see the contributions of Cameron et al. (2015); Beine et al. (2013); Barsbai et al. (forthcoming); Spilimbergo (2009); Batista and Vicente (2011); Ivlevs and King (2014).

<sup>4</sup>See Docquier and Rapoport (2012) for an excellent discussion of the literature.

<sup>5</sup>In 2013, countries with a comparable per capita GDP (in 2011 \$-PPP) were, for example Pakistan (\$4,454), Nicaragua (\$4,493) and Lao (\$4,667).

<sup>6</sup>The most common emigration destination for circular migrants is Russia. While migration to Russia is usually characterized by short-term stays and manual labor, emigration to the West is more permanent, service-sector oriented and feminized (60% women). Italy and Romania are particularly important destination countries due to linguistic proximity.

<sup>7</sup>Moldova has compulsory schooling until the end of lower secondary schooling (roughly age 15)

<sup>8</sup>ESP/NEPC (2010) describes results from in-depth interviews on informal payments in 7 ex-communist countries. In that study, a majority of Moldovan parents reports being pressured by both teachers and other parents to comply with informal payments.

<sup>9</sup>This problem was so widespread that some time after our survey took place the education minister introduced video surveillance during the final high school exam, a move that led to a spike in failure rates. Something similar has recently been studied in Romania, see Borcan et al. (2017).

<sup>10</sup>Heyneman et al. (2008), for example, discuss survey data which indicate that about 80% of university students in Moldova, Bulgaria and Serbia were aware of illegal bribe paying in university admission.

<sup>11</sup>The response rate was above 80%. For detailed information on the survey see Böhme and Stöhr (2014); Böhme et al. (2015).

<sup>12</sup>The main caregiver is the person responsible for nutrition, health, and schooling of a child at the time of the survey.

<sup>13</sup>In addition, there is a residual category of “other expenditure” for which we find statistically insignificant effects.

<sup>14</sup>Our dataset does not allow us to compare the differences between migrant households with and without children. Comparisons to other representative data (details on request) reveal that in households with children, female migration is on average less common. The education level and gender composition do not differ markedly.

<sup>15</sup>In reality, the difference could be even wider, since migrant households systematically under-report their received remittances and other sources of income (Akee and Kapur, 2012).

<sup>16</sup>The asset indexes were constructed by a weighted-sum of the following items: number of cars, mo-

torcycles, bicycles, washing machines, refrigerators, radios, TVs, computers, and cell phones; existence of working phone landline and internet access; and number of rooms in the house. For 1999, the last three items were excluded due to a large number of missing values. The weights for the index were obtained from a principal component analysis of the asset list. Dividing the divisible assets by the squared root of household size as an equivalent scaling rule does not change Figure 1 in any qualitative way.

<sup>17</sup>This figure is remarkably similar to the one reported in the 2013 Global Corruption Barometer: 37% of households in Moldova that came into contact with education authorities paid bribes in the 12 months before the survey (Transparency International, 2013). We focus on the likelihood of paying informal fees rather than the values paid since we assume the decision to participate in the informal fee scheme to be the most affected by a change in preferences. Note that we added 1 LCU to each private expenditure to ensure that the log exists.

<sup>18</sup>See Figure S.2 for an illustration.

<sup>19</sup>The most common approach in the literature are instrumental variable strategies exploiting exogenous aggregate factors at the origin or destination: past migration rates (McKenzie and Rapoport, 2010; Antman, 2011; Zhang et al., 2014), financial infrastructure (Calero et al., 2009), and political unrest (Bansak and Chezum, 2009) at the origin-level; employment conditions (Antman, 2011; Cortes, 2015) and exchange rate crises (Yang, 2008) at the destination-level.

<sup>20</sup>Analytically:

$$\text{Network-Growth}_c = \sum_{j=1}^J \left( \frac{\text{migrants}_{c,j,2004}}{\text{population}_{c,2004}} \sum_{t=1}^T \left( \frac{\text{GDP}_{j,t+1} - \text{GDP}_{j,t}}{\text{GDP}_{j,t}} \right) \right)$$

where  $c$  is the Moldovan community;  $j = 1, 2, 3, \dots, J$  is the migration destination countries and  $t = 2004, 2005, \dots, 2010$  the year.

<sup>21</sup>An advantage of our setting is that migration has been a relatively recent phenomenon in Moldova and, thus, there is little scope for the non-migrant population to be influenced over time due to spillovers and long-term confounding developments that might have arisen over time. As a robustness check, we exclude for the analysis the migrant households which already had a migrant in 2004 or before, as they might be included in the Census migration rates. The main results do not change qualitatively (available upon request).

<sup>22</sup>To better capture the individual gains from migration, rather than the rise in opportunities, we alternatively use the change in GDP per capita. This results in comparable results in magnitude and significance. The Kleibergen-Paap weak identification statistic is however smaller than when using GDP growth for the IV.

<sup>23</sup>Alternatively using only one control for all migrant shares does not yield different results but we prefer keeping to the more conservative ability to control also for different border effects as in that earlier paper.

<sup>24</sup>A one standard deviation increase in the instrument implies a 2.5 percentage point reduction in enroll-

ment.

<sup>25</sup>See Tables S.3, S.4 and S.5 for the point estimates of the control variables for Panels B and C.

<sup>26</sup>In addition, alternative estimates obtained from an IV probit estimation can be found in Table S.6 for comparison.

<sup>27</sup>Table S.7 presents OLS estimates for the same set of covariates. Due to the inclusion of a selection correction, covariates such as household size that are predictive of migration but not of informal payments pick up the correlation between migration and informal payments to teachers. The lack of a selection correction also results in statistically significant positive effects on transport expenditure, which are explained by higher available income as additional results show (available upon request).

<sup>28</sup>Private educational spending responds to public funding, see for example Houtenville and Conway (2008).

<sup>29</sup>We do not find evidence that they are systematically correlated with migration.

<sup>30</sup>The first-stage estimates are reported in column 2 of Table S.4.

<sup>31</sup>Table S.12 provides OLS results when the sample is split by migration status. The negative coefficient on the teacher-pupil ratio (proxied by wages per pupil) is similar for both migrant and non-migrant households, although statistically insignificant for the former.

<sup>32</sup>Note that migration as a major source of income inequality is not exogenized here due to a lack of a valid within-community IV.

<sup>33</sup>There is no statistically significant correlation between any school budget variable and the migration share of pupils in the household survey. Also, if migrant parents were planning to send their children abroad and therefore stopped paying local teachers, there should be strong differences within schools.

<sup>34</sup>Alternatively, the main effects of migration on the provision of educational inputs remain unchanged after including the perceived school quality variable as an additional control (available upon request).

<sup>35</sup>The sample contains 1100 individuals from 76 communities and is nationally representative of the adult population. All results are available upon request.

<sup>36</sup>Our instrumental variable strategy does not allow us to identify destination specific effects. Therefore, our results are the average migration effect across all destinations, not just Western countries. If the effect is entirely driven by migration to the West, where corruption is far less common than in Moldova, then our 2SLS estimates are a lower bound for the true Western migration effect.

<sup>37</sup>We define a return migrant as an adult that spent more than 3 months abroad in one single spell since 1999 but is no longer a migrant at the time of the survey.

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## *Figures*

Figure 1: Kernel density plots of the household asset index in 1999 and 2011

*Notes:* Authors' calculations based on CELB 2012.

## Tables

Table 1: Selected summary statistics

	Non-migrant Households			Migrant Households			Mean equality (t-test)
	N	Mean	(SD)	N	Mean	(SD)	
<i>Child characteristics</i>							
Age	1783	12.28	(3.73)	718	12.68	(3.79)	**
Male	1783	0.51		718	0.51		
Grade Point Average (GPA) (0-10)	1355	8.04	(1.07)	555	8.10	(0.93)	*
Serious illness (past year)	1783	0.29		718	0.26		
Distance to school (min)	1659	20.76	(18.39)	668	19.92	(17.53)	
<i>Household characteristics</i>							
Total income	1783	33819.11	(36592.44)	718	48901.40	(49005.71)	***
Household size	1783	4.70	(1.39)	718	5.13	(1.75)	***
Mean years education	1782	10.74	(2.40)	718	10.68	(1.93)	
Urban	1783	0.24		718	0.15		***
Older siblings	1783	0.59		718	0.58		
Parents divorced	1783	0.12		718	0.10		
<i>Private inputs to child's education</i>							
Caregiver time	1565	3.78	(1.94)	640	3.62	(1.97)	*
Payments to teachers	1552	89.09	(275.56)	635	65.62	(163.85)	**
Out-of-school tutoring	1572	192.70	(1179.89)	642	86.57	(376.58)	***
Transportation expenditures	1565	202.85	(775.61)	644	209.29	(902.19)	
<i>Network-Growth Instrument</i>							
	Number of communities	Mean	(SD)	Min	Max		
	129	277.66	(140.22)	2.33	691.70		

Notes: Authors' calculations based on CELB 2012. All monetary values are expressed in Moldovan Lei. \*, \*\*, and \*\*\* indicate  $p < 0.10$ ,  $p < 0.05$ , and  $p < 0.01$ , respectively.

Table 2: The effect of migration on private education inputs

**PANEL A**

Basic OLS results

Payment to teachers

	Community level		Individual level		
	(1) all	(2) all	(3) 10+	(4) 15+	(5) 18+
Migration	-0.415*** (0.119)	-0.046 (0.028)	-0.055* (0.031)	-0.069* (0.040)	-0.131** (0.058)
<i>N</i>	129	2287	1764	898	330

**PANEL B**

Reduced form estimates (OLS)

	School enrollment	Payments to teachers		Out-of-school tutoring		Transportation expenditure		Caregiver time
	(1)	(2) log	(3) $D(Y > 0)$	(4) log	(5) $D(Y > 0)$	(6) log	(7) $D(Y > 0)$	(8)
Network-Growth	-0.000** (0.000)	-0.005** (0.002)	-0.001** (0.000)	-0.002*** (0.001)	-0.000*** (0.000)	0.000 (0.002)	0.000 (0.000)	0.003*** (0.001)
<i>Child characteristics</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Household characteristics</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Main migration destinations</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	2223	2148	2148	2170	2170	2168	2168	2162
$R^2$	0.064	0.068	0.042	0.095	0.084	0.173	0.168	0.265
F-stat	5.72	7.85	5.86	4.11	4.43	13.3	14.0	40.5

**PANEL C**

First stage IV regressions

Migration

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Instrument</i>								
Network-Growth	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
<i>Child characteristics</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Household characteristics</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Main migration destinations</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	2223	2148	2148	2170	2170	2168	2168	2162
F Statistic	9.6	10.6	10.6	11.0	11.0	10.7	10.7	10.6

Second stage IV regressions

	School enrollment	Payments to teachers		Out-of-school tutoring		Transportation expenditure		Caregiver time
	(1)	(2) log	(3) $D(Y > 0)$	(4) log	(5) $D(Y > 0)$	(6) log	(7) $D(Y > 0)$	(8)
Migration	-0.129 (0.097)	-4.430*** (1.717)	-0.829** (0.332)	-1.987** (0.869)	-0.274** (0.126)	0.247 (1.905)	0.091 (0.304)	2.667* (1.449)
<i>Child characteristics</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Household characteristics</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Main migration destinations</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	2223	2148	2148	2170	2170	2168	2168	2162
K-P weakid	9.6	10.6	10.6	11	11	10.7	10.7	10.6
95% CLR confidence set	[-0.4, 0.06]	[-9.25, -1.88]	[-1.76, -0.32]	[-4.99, -0.01]	[-0.71, 0.02]	[-2.34, 2.82]	[-0.28, 0.49]	[0.99, 5.57]
CLR test p-value	0.17	0.00	0.00	0.05	0.07	0.83	0.60	0.00
Cluster-robust 95% AR conf. set	[-0.51, 0.02]	[-9.12, -0.83]	[-1.68, -0.08]	[-5.12, -0.65]	[-0.72, -0.07]	[-3.45, 5.91]	[-0.47, 1.02]	[0.66, 8.35]
Cluster-robust AR p-value	0.11	0.03	0.04	0.01	0.01	0.90	0.76	0.01

Notes: Authors' calculations based on CELB 2012. Standard errors in parentheses. Panel A uses heteroskedasticity-robust standard errors throughout. Panels B and C use heteroskedasticity-robust standard errors that cluster at the community level. All models include a constant. *Child characteristics*: age, gender, serious illness in the past 12 months (dummy variable), and the (log) distance to school in minutes. *Household characteristics*: mean years of education of adult members, older siblings (dummy variable), household size, parents divorced and urban/rural residence status. *Main migration destinations*: 2004 share of the community's population that is a migrant to Italy, Ukraine, Romania and Russia (4 variables). \*, \*\*, and \*\*\* indicate  $p < 0.10$ ,  $p < 0.05$ , and  $p < 0.01$ , respectively. In Panel A, column 1: migration indicates the share of migrant households in the community; the dependent variable is the community's share of respondents reporting positive informal payments to schoolteachers. Interpreting Panel A column 1, please note that the survey was not designed to be representative at the community level. Panel B reports the reduced form where the outcome of the second stage is regressed on the instrument (*Network Growth*) and the endogenous variable (migration) is excluded. Note that interpreting the size of the instrumental variable is not easy, because it is a sum of Network-Growth Interactions. Differences in missing values for the dependent variables explain the different number of observations across columns. Panel C shows the first and second stage regressions. Migration is instrumented using a network-growth interaction IV. K-P weakid is the Kleibergen-Paap weak identification statistic. The CLR test refers to confidence region and the test statistic using the "condivreg" package by Mikusheva and Poi (2006). The cluster-robust AR 95% confidence set is calculated using the "rivtest" package by Finlay and Magnusson (2009). Coefficients for all the control variables shown in supplemental appendix: reduced form (Panel B) in Table S.3, first stage (Panel C) in Table S.4, column 1, and second stage (Panel C) in Table S.5.

Table 3: The effect of migration on private education inputs: controlling for household assets

<i>Second stage IV regressions</i>	<i>D(Payments to teachers) &gt; 0</i>		<i>Caregiver time</i>	
	(1)	(2)	(3)	(4)
Migration	-0.964** (0.434)	-0.636** (0.259)	3.887* (1.996)	2.665*** (1.003)
Household asset index (log)	0.212*** (0.080)		-0.417 (0.364)	
Household asset index 1999 (log)		0.031 (0.037)		0.151 (0.098)
<i>Child characteristics</i>	Yes	Yes	Yes	Yes
<i>Household characteristics</i>	Yes	Yes	Yes	Yes
<i>Main migration destinations</i>	Yes	Yes	Yes	Yes
<i>N</i>	2186	1708	2354	1824
<i>K-P weakid</i>	6.601	16.857	6.935	22.776

*Notes:* Authors' calculations based on CELB 2012. Heteroskedasticity robust standard errors that cluster at the community level in parentheses. See endnote 16 for a list of assets included in the asset index. *Child characteristics:* age, gender, serious illness in the past 12 months (dummy variable), and the (log) distance to school in minutes. *Household characteristics:* mean years of education of adult members, older siblings (dummy variable), household size, parents divorced and urban/rural residence status. *Main migration destinations:* 2004 share of the community's population that is a migrant to Italy, Ukraine, Romania and Russia (4 variables). \*, \*\*, and \*\*\* indicate  $p < 0.10$ ,  $p < 0.05$ , and  $p < 0.01$ , respectively. K-P weakid refers to the Kleibergen-Paap weak identification statistic. Migration is instrumented using a network-growth interaction IV.