Does emigration reduce tobacco smoking among those staying behind? Household-level evidence from the Western Balkans.

Artjoms Ivlevs

Bristol Business School and IZA[1]

Roswitha M. King

Østfold University College[2]

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Abstract

High rates of emigration and high or growing rates of smoking tobacco are salient features of many low- and middle-income countries, yet the links between migration and smoking remain underexplored. We study the effects of household member emigration and receipt of monetary remittances on the likelihood of smoking among people staying behind in the countries of former Yugoslavia. Using data from the Gallup Balkan Monitor survey and instrumental variable analysis, we find that the emigration of household members reduces the likelihood of smoking, especially among women and older respondents. These findings support the conjecture that migration contributes to the transfer of smoking-related norms and practices from destination to source countries.

Keywords: emigration, smoking, monetary remittances, social remittances, Western Balkans.

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[1] *Corresponding author*. Department of Accounting, Economics and Finance, Bristol Business School, University of the West of England, Bristol BS16 1QY, UK. Tel: +44 117 32 8371, E-mail: a.ivlevs@uwe.ac.uk
[2] Department of Economics, Østfold University College, N-1757 Halden, Norway. Tel: +47 69 21 52 64, E-mail: roswitha.m.king@hiof.no

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1. INTRODUCTION

Around one in seven of people worldwide, and one in four men, smoke tobacco. Every year, smoking claims lives of seven million people, including 890,000 from second-hand smoke exposure (World Health Organisation, 2017a). The low- and middle-income countries are particularly affected: they account for 80% of global smokers and deaths from smoke (US National Cancer Institute and World Health Organisation, 2016). Tobacco use represents a major barrier to sustainable development affecting not only people's health but also poverty, global hunger, education, economic growth, gender equality, the environment, finance and governance (World Health Organisation, 2017b). Another phenomenon which is both affecting and being affected by the development of low- and middle-income countries is international migration. Migration provides hope, lifeline and safety to millions, but also remains a major concern for governments across countries at all stages of development. The salience of both smoking and migration in the developing world and the myriad of policy efforts directed toward each of them invite to explore the linkages between the two. In this paper we pose the question: Does migration augment or reduce smoking in the migration-sending countries?

In particular, we ask whether emigration of household members has an effect on smoking behaviour of those staying behind. One can conceive of several, potentially conflicting, channels through which emigration, as well as the associated monetary remittances, might affect the likelihood of smoking of those staying behind. In accordance with Levitt's (1998) social remittances hypothesis, migrants who work in a country where smoking is less (more) prevalent than in the country of origin may transfer good (bad) practices directly from the host country to family members back home. This transfer would manifest itself as reductions (increases) in smoking behaviour. At the same time, if smoking is considered a normal good, households receiving monetary remittances may afford to purchase more tobacco products and be generally more likely to smoke. It is also possible that emigration of family members results in a feeling of loneliness and depression among those staying behind, who then resort to smoking in an attempt to mitigate these adverse mental states.

Empirically, the potential endogeneity of migration poses a serious challenge to exploring the effect of migration on the incidence of smoking. Endogeneity might arise due to unobserved heterogeneity – characteristics of people (and/or households) that drive both the willingness to migrate and the propensity to smoke. It is also possible that emigration itself is driven by excessive smoking of family members – a type of reverse causality. We handle endogeneity by conducting instrumental variable analysis where out-migration is predicted by historical, local-level migrant networks to different migrant destinations, interacted with recent economic conditions in those countries.

Contextually, we focus on the successor states of former Yugoslavia, which are particularly well suited for our analysis. Several countries of the region – Croatia, Bosnia and Herzegovina, and Serbia – have some of the highest rates of tobacco use in Europe and the world (30-46% of people aged 15+ in these countries smoke tobacco; the European average is 28.7% and the world average is 21.9%) (World Health Organisation 2018). At the same time, decades of emigration, with a major wave of guest worker migration occurring in the 1960s and early 70s, generated massive diasporas and large inflows of monetary remittances: in 2014, migrant money transfers ranged from 8% to 16% of GDP in Bosnia and Herzegovina, Kosovo, Montenegro and Serbia (Source: World Bank World Development Indicators). To test the effects of emigration on smoking behaviour among those staying behind in ex-Yugoslav countries, we use the Gallup Balkan Monitor, a nationally representative survey conducted in 2010 and 2011 in six successor states of Yugoslavia (Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Kosovo, Montenegro, and Serbia) by the international opinion poll agency, Gallup. The results, based on instrumental variable estimations, suggests that emigration of household members reduces the incidence of smoking, especially among women and older respondents.

This paper advances scholarly discourse in several, related, ways. First, it contributes to the growing literature on the effects of emigration on health outcomes and behaviours of migrant family members staying behind, mainly the parents and children of migrants (see, e.g., Anton, 2010; Antman, 2010; Antman 2016; Bohme et al., 2015; Creighton et al., 2011; Gibson et al. 2015; Hamilton and Choi, 2015; Hildebrandt and McKenzie, 2005; Kanaiaupuni and Donato, 1999; Kroeger and Anderson, 2014; Kuhn et al., 2011; Riosmena et al., 2012).

This literature has focused on outcomes such as subjective evaluation of health, obesity, body mass index, mental health, ability to perform daily tasks, nutritional diversity, and child birth indicators. Harmful behaviours affecting health, such as smoking, have remained underexplored and we fill this gap by providing insights from the countries of former Yugoslavia. Second, our paper adds to a burgeoning literature on social/non-monetary remittances, also referred to as diaspora externalities. This body of work studies the effects of emigration on the behavioural, social, political and institutional outcomes in the migrants' countries of origin (see e.g. Batista and Vicente, 2011; Barsbai et al., 2017; Bertoli and Marchetta, 2015; Beine et al., 2013; Chauvet and Mercier, 2014; Docquier et al., 2016; Ivlevs and King, 2017; Levitt, 1999; Li et al. 2016; Montferio et al., 2014; Nikolova et al., 2017; Pfutze 2012) and increasingly acknowledges the crucial role of migration in transferring ideas, norms, behaviours and practices from host to home countries. Despite a multitude of outcomes that have been addressed in this literature (e.g., government accountability, political participation, women empowerment, petty corruption, fertility, participation in social groups, land-use practices), the role of migration in transferring the norms and behaviours related to tobacco smoking has remained unexplored and it is the focus of our paper.

The remainder of the paper is structured as follows. Section 2 introduces the context of migration and smoking in the successor states of Yugoslavia. Section 3 outlines theoretical mechanisms through which migration may affect smoking behaviour at home. Section 4 presents the data, variables and estimation strategy. Section 5 reports and discusses the results, followed by a conclusion.

2. CONTEXT

2.1 Emigration from the ex-Yugoslav region

For most of the successor states of the former Yugoslavia, repeated waves of emigration formed massive diasporas and generated large flows of monetary remittances. Emigration from this region became known as a *longue duree* phenomenon: The United States, Canada, South America and Australia were the preferred destinations of this large-scale trans-oceanic emigration at the end of the 19th century, the beginning of the 20th century, and in the interwar period (Brunnbauer 2009). Yet another major wave of migration was set in motion

in the 1960s, when, in a confluence of interests, a labour shortage in the industrialised countries of 'the west' coincided with a surge in unemployment in Yugoslavia. Beginning in the 1960s and continuing into the early 1970s the Yugoslavian government signed bilateral recruiting agreements for Yugoslavian 'guest workers' with Germany, France, Austria, Switzerland, Sweden, Australia and other countries of the 'industrialised west' (Column 1 of Table 1). Market-oriented reforms toward increased efficiency in production and distribution in Yugoslavia in the 1960s had the undesirable side effect of creating substantial unemployment. At the same time the post-WWII economic boom in western Europe, North America and Australia brought forth a growing demand for construction and manufacturing workers that the local labour markets fell short of satisfying. 'Contract emigration' from Yugoslavia seemed like a practical solution for both sides of the contracts, and the Yugoslavian government actively supported it. However, as this 'solution' did not reflect favourably on the underlying economic management in Yugoslavia, the country's government viewed it as a 'necessary evil' to alleviate labour market problems (Mlinaric 2009). As Brunnbauer (2009) reports, 3.8% of all Yugoslav citizen worked abroad in 1971.

Table 1. Distribution of Yugoslav migrants by destination, 1971 and 2010-2011

Country of destination	1971[a]	2010-2011[b]
Germany	61.2%	37.3%
Austria	12.3%	12.1%
Australia	6.0%	6.6%
France	5.5%	5.3%
United States and Canada	4.4%	22.7%
Belgium, Netherlands, Luxemburg and Sweden	3.5%	10.8%
Switzerland	3.2%	13.2%
Italy	-	7.5%
United Kingdom	-	2.4%

Notes:
[a] - share of all emigrants; source: Baucic, 1973b.
[b] - share of households indicating that their relatives/friends live in a particular country (up to three destinations possible); source: Gallup Balkan Monitor.

As the term 'guest worker' suggests, this post-WWII emigration was assumed to be of temporary nature. This assumption proved to be wrong. When the demand for workers declined after the 1973 oil price shock, many of the migrants stayed in the host countries. As a matter of fact emigration from Yugoslavia continued in the 1970s and 1980s in the form of

family re-unification (Zimmerman 1987). By now migration had become a mass phenomenon in Yugoslavia. A culture of migration had firmly established itself, and inflows of monetary remittances had become a staple in the Yugoslav economy.

2.2. Smoking tobacco and associated health problems in countries of Former Yugoslavia

Tobacco use in Europe is known[3] to show large variation. West-European countries' smoking rates generally lie below Eastern- and particularly South-Eastern Europe smoking rates, as illustrated by the table below.

Table 2 Tobacco Smoking among persons 15 years and older in Western Balkan States and their major emigration destination countries (%) 2016

Country	%
Bosnia and Herzegovina	39.0
Croatia	37.1
Montenegro	46.0
Serbia	39.0
Former Yugoslav Republic of Macedonia	30.0
Kosovo	28.4

Germany	30.7
Austria	29.7
Australia	14.8
France	32.9
USA	21.9
Canada	14.3
Belgium	28.3
Netherlands	25.9
Luxemburg	23.5
Sweden	18.9
Switzerland	25.8
Italy	23.8
United Kingdom	22.4

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Notes:

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[3] Maybe lesser known is the fact that Europe's smoking rate is high relative to other regions of the world. The World Health Organization (2018) shows an age-standardized smoking rate of 28.7% for Europe, against a global rate of 21.9%. Europe holds a particularly extreme relative position when it comes to smoking among females: 19% against a global average of 7%.

Table 2 shows age-standardized prevalence of tobacco smoking in percent.
Source: World Health Organisation (WHO) 2018 except data for Kosovo and Former Yugoslav Republic of Macedonia (FYRM).
Kosovo data is taken from Gashi, S. et al. (2017). The survey that generated the Kosovo data was conducted between September 2010 and March 2011. FYRM data is taken from World Health Organisation Report on the Global Tobacco Epidemic (2017c), Country Profile FYRM.
The table does not show data on Albania, because Albania is not included in our investigation.

Already in the early 2000s concerns were raised about a growing tobacco epidemic in the Western Balkan states – leading to the recommendation that public health authorities should consider tobacco as the #1 public health threat (Bozicevic et al 2004). Smoking is estimated to be the leading cause of death and disability among men and the fourth largest cause among women in the Western Balkans.

Judging from historical data, smoking among males in the Western Balkan states follows a long and firmly established addiction pattern. Among females, however, tobacco addition is a relatively recent phenomenon – and it is on the rise. Smoking rates among young women are significantly higher than among older women, and a rise in tobacco induced female mortality is expected. Smoking rates in urban areas are observed to exceed those in rural areas. One of the reasons may be a higher exposure to advertising in urban areas. (Bozicevic et al 2004). While on the demand side of the tobacco market the stresses of economic transition and armed conflict figure prominently as causal factors of high tobacco consumption, the supply side also did its part. The dissolution of the Soviet Union and the opening of the Western Balkan markets to imports and foreign investments opened the door for transnational tobacco companies, who competed with local companies (Western Balkan States grow and process tobacco) and, assisted by substantial tobacco smuggling, lowered tobacco prices – again, increasing consumption (Bozicevic et al 2003/2004).

Tables 1 and 2 convey that emigrants from the Western Balkan states to Western Europe, North America and Australia are predominantly moving from countries of relatively high smoking prevalence to countries of relatively lower smoking prevalence – a fact that underlies the line of argumentation in the remainder of this paper.

3. EMIGRATION AND SMOKING BEHAVIOUR: THEORETICAL CONSIDERATIONS

We can think of at least three mechanisms through which emigration of household members may affect the smoking behaviour of family members staying behind. The first mechanism is through monetary remittances that migrants send back home. Remittances relax household budget constraints and increase the consumption of cigarettes if smoking is a normal good. Evidence suggests that the income elasticity of tobacco smoking is positive; in addition, it tends to be higher in poorer countries and low-income settings (US National Cancer Institute and World Health Organisation, 2016). In several low- and middle- income countries, income elasticity of smoking tobacco is higher than 1 indicating that smoking is indeed a 'luxury' good (Selvanathan and Selvanathan, 2006). The ex-Yugoslav region on which we focus in our study comprises mostly middle-income countries, parts of which are relatively poor and rely heavily on migrant remittances. From this perspective, we would expect people in remittance-receiving households to spend more money on cigarettes (smoke more, buy better quality products or be less likely to quit smoking) as remittances flow in.

Second, during their stay abroad migrants may get exposed to, absorb, and transmit back to their home countries norms about smoking prevailing in the host countries, which may influence smoking behaviour of both migrants and family members staying behind. This conjecture is consistent with Levitt's (1998) "social remittances" hypothesis, whereby migrants internalise the ideas, practices, identities and social capital of the countries of destination and transmit them to the countries of origin through correspondence, visits and return migration. Whether migration will result in more or less smoking by family members left behind in the countries of origin will depend on whether migrant countries of destination have higher or lower prevalence of smoking than the country of origin. The successor states of former Yugoslavia have some of the highest tobacco use rates not only in Europe but also in the world, and migrants from this region go to wealthy European or North American countries where smoking prevalence tends to be lower (source: World Health Organisation/Global Health Observatory database). Therefore seen through the lens of the social remittances framework, we expect migration to reduce smoking among those staying behind. It must be added that monetary remittances may reinforce the transfer of norms, values and behaviours (Ivlevs and King, 2017). One reason for this is the communication effect: sending monetary remittances implies closer links and more frequent communication

between migrants and their family members back home, making value transfer more effective. Another reason is the conditionality effect: senders of monetary remittances may also be particularly successful in influencing the behaviours and norms of those left behind as the livelihoods of the latter depend on the money sent from abroad. For example, migrants could threaten to stop sending monetary remittances if they think that family members are reluctant to stop smoking and/or waste remitted money on harmful substances. The receipt of monetary remittances can thus not only increase (as was the case with the household budget relaxation conjecture) but also reduce smoking among those staying behind – leaving the net effect, a priori, uncertain.

Finally, it is well documented that migrant family members staying in the countries of origin have a greater likelihood of feeling lonely, depressed and stressed (Antman 2016; Antman 2010; Mosca and Barrett, 2016; Ivlevs et al., 2018). Most often these feelings are brought about by the separation from the loved ones; however, adverse mental states can also be caused by increased workload or a change in the head of household after a family member moves abroad. To deal with loneliness, stress and depression people may start or increase smoking; there is indeed evidence that smokers believe that smoking helps alleviate feelings of depression, stress and anxiety, and stabilise mood (Clancy et al., 2013; Filder and West, 2009; Taylor et al., 2014). Emigration of family members could thus lead to poorer mental health and, through it, to increased smoking.

Overall, from the theoretical point of view the effect of emigration and the receipt of monetary remittances on smoking behaviour of those staying behind is ambiguous. Which of the theoretical mechanisms dominates and whether the overall effect is positive or negative is an empirical question, to which we turn in the next section.

4. DATA, VARIABLES AND ESTIMATION STRATEGY

4.1. Data

Our empirical analysis is based on the Gallup Balkan Monitor survey. In the form of repeated cross-sections the survey was carried out in Albania, Bosnia and Herzegovina, Croatia, Kosovo, the Former Yugoslav Republic of Macedonia, Montenegro and Serbia in 2006, and

annually from 2008 to 2011, by the international opinion poll agency, Gallup. Nationally representative samples consisted of approximately 1,000 people interviewed in each country each year. We exclude Albania from the sample for the following reason: Our instrumental variable analysis relies on data from the population census of the former Yugoslavia. Albania was not part of Yugoslavia and is, therefore, not covered by the census data. Furthermore we exclude the years 2006, 2008 and 2009 from the analysis, as the geographical disaggregation of the data is not sufficient to match the data with the local level information from the census. Our sample thus covers six countries over two years (2010 and 2010) and consists of just over 12,000 observations.

4.2. Variables

4.2.1 Smoking incidence

We use the survey question "Did you smoke yesterday?" with possible answers "Yes" and "No" to create a corresponding dichotomous variable. Overall, 38% of respondents said they had smoked in the day prior to the interview, ranging from 34% in Kosovo to 41% in Bosnia and Herzegovina.

4.2.2 Migration-related variables

Two of the survey's questions serve to construct our migration-related variables. First, "*In the past 12 months, did this household receive help in the form of money or goods from another individual",* with possible answers 1) Yes, living in this country; 2) Yes, living in another country; 3) Yes, both (living in this or another country); and 4) No. We construct a dichotomous variable, *remittances*, by joining the second and third answers to the question. Second, the respondents were asked, *"Do you have relatives or friends who are living in another country whom you can count on to help you when you need them, or not?"* Potential foreign networks are addressed by this question. Responding with 'yes' would imply that a respondent maintains a minimum level of communication with the relative/friend abroad. This may be seen as a condition that is needed for a migrant to transfer values, norms and practices to family members in the country of origin.[4]

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[4] Note that the way in which the networks' question is phrased probably overestimates the effects of migration relative to a more standard definition of foreign networks relying on any relatives or friends abroad.

We also have information on the host countries where the respondents' friends and relatives reside at the time of the interview. Not surprising, most of them are Western industrialized economies. There is an unmistakable correspondence between these countries and the destinations of the Yugoslav 'guest workers' in 1971 (Table 1). It should also be mentioned that, in 11% of cases, the migration destinations are other successor states of the former Yugoslavia. We do not classify these cases as *foreign* networks, as they are likely to originate from past internal migration, formation and shifting of national borders after the breakdown of Yugoslavia, as well as the refugee flows of the 1990s and 2000s.[5] Thus, we restrict attention to international migrant networks, which, geographically, extend beyond the borders of the former Yugoslavia. We construct a dichotomous variable *non-recipient migrant household*, which is equal to 1 if a respondent has a relative/friend abroad but does not receive remittances, and 0 otherwise (remittance-recipient or non-migrant household). In this way we have two variables capturing migrant households with and without incoming monetary remittances. A further dichotomous variable, *migrant household*, is constructed, which serves to capture generic family member migration (with or without remittances).

4.2.3 Socio-demographic and other controls

In all regressions we include the following sociodemographic controls: age (measured in years, continuous), and dichotomous variables for gender, education level (primary, secondary, tertiary), five within-country income quintiles, four degrees of urbanisation (rural area/farm, village/small town, suburb of a large city, large city), and main religious affiliations (Orthodox, Catholic, Muslim, other). Country/region fixed effects (dichotomous variables for Croatia, Bosnia and Herzegovina, Serbia, Macedonia, Kosovo, Montenegro, as well as for the Serbian region of Vojvodina) are entered to control for unobserved country-level factors (time-invariant between 2010 and 2011), which could be correlated both with migration intensity and smoking incidence.

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[5] For the purposes of this paper, respondents with networks in former Yugoslavia are considered non-migrant households and they are not dropped from the analysis.

4.3. Estimation strategy and instrument

Our objective is to estimate the following model:

$$SMOKING_{ij} = \alpha + \beta MIGRATION_{ij} + \gamma X'_{ij} + \pi_j + Year\_2011 + u_{ij}, \quad (1)$$

where, for individual *i* living in country *j, MIGRATION* stands for migration-related variables (remittance-recipient and non-recipient migrant households). Vector *X* includes sociodemographic controls, the π_j are country/region fixed effects, *Year_2011* is a dichotomous variable for year 2011, and u_{ij} is the error term.

We estimate the model with binary probit on account of the binary nature of the dependent variable. We first report *conditional correlations*, i.e., the results of the models that do not address the potential endogeneity of migration and remittances. Subsequently we employ the instrumental variable (IV) approach to deal with potential endogeneity and determine the *effect* of migration on the likelihood of smoking. To check whether our results our driven by specific demographic groups, we also report the results separately for women and men, as well as younger (age $\leq$ 42)[6] and older (age > 42) respondents.

Following Böhme et al. (2015), Höckel et al. (2015) and Ivlevs and King (2017), we construct an instrument for emigration at the household level by using the interaction between historical municipality-level migration networks and the economic conditions at the main migrant destination countries (municipality-level variable). In particular, for each municipality we calculate the following: We take the summation of the GDP growth rates of major migrant destinations weighted by the pre-existing migrant networks (the number of migrants relative to municipality population) in those destinations. Formally,

$$Migration\text{-}Growth\text{-}Interaction_c = \sum_j \frac{Migrants_{c,j,1971}}{Population_{c,1971}} \times \left(\frac{1}{5} \sum_\tau GDP\ growth_{\tau,j}\right), \quad (2)$$

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[6] 42 is the median age in our sample.

where c is municipality, $j = 1, 2, ... , J$ is the migration destination country, and $\tau = 2001, ...$ 2005 are the five years over which the destination countries' growth rates will be calculated. The choice of the 2001-2005 period for the destination countries' growth rates, and of the year 1971 for pre-existing migrant networks, is explained in more detail below. Note that the same time horizon for growth rates (2001-2005) is used to construct the instrument for respondents interviewed in both 2010 and 2011, and, as such, the instrument is not time-varying.

We have the expectation that the municipality-level networks-destination-growth interaction predicts current emigration in two ways. First, it is known that pre-existing migrant networks serve as powerful predictors of the emigration decision. Migration costs are reduced by receiving help from existing migrant networks both prior to the move and after the move. This help comes in the form of information about a destination, assistance with financing, employment and accommodation and other types of support (see, e.g., Massey 2005). Brunnbauer (2009) shows that networks played a crucial role in explaining successive waves of Yugoslavian out-migration (Brunnbauer). Second, with regard to economic conditions, high GDP growth rates in the destination countries, and other favourable economic conditions, promise better job opportunities, which act as a pull factor for prospective migrants (Antman 2011). A further consideration: The larger the network, the larger is the pool of already settled former migrants that can convey information – especially information about favourable economic conditions at destination. Thus, our instrument's network component reinforces its economic growth at destination component.

The 1971 Population Census of Yugoslavia provided the information on the historical migrant networks (Baucic 1973b). During this census migrants' family members supplied information on the number of migrants, as well as migrants' gender, age, education and, crucially for this study, destination countries.[7] In cases where the entire household had emigrated, this information was supplied by neighbours. Only the records on "Yugoslav workers temporarily employed abroad" were collected by the census: the data thus capture only guest worker migration flows, which started in the mid-1960s and hit their peak in

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[7] The data are available for the major migrant destinations: Austria; Australia; Canada and the United States (jointly); France; Sweden and the Benelux countries (jointly); Switzerland; and West Germany.

1971, and underestimate the total stock of Yugoslav emigrants at that time. Importantly for our study, all information on migrant stocks is available at municipality/commune level.

With regard to our instrument's component 'economic conditions at the migrant destinations' this is calculated as the average of the destination countries' GDP growth rates in the 2001-to-2005 time-span. This time period, just prior to the financial crisis and global recession, was characterized by strong economic growth across most of the world, sending a strong signal to prospective migrants. So our instrumental variable analysis will capture the effects of migration and remittances that are driven by the relatively recent economic developments in historical migrant destinations.

To demonstrate the exogeneity of our instrument we need to take the point of view of both its network- and its GDP growth component. Any direct effect of the destination countries' GDP growth rates on smoking-related outcomes in the migrants' countries of origin can convincingly be ruled out: it is difficult to think of channels through which economic conditions in foreign countries would lead to differential smoking behaviours within a migrant's source country – apart from the effect channelled through migration. The possibility that historical migration networks, the other component of the instrument, might be directly related to home-country rate of tobacco use invites some discussion. It can, for example, be theoretically not ruled out that local guest worker emigration in the 1960s and 1970s might have been driven by the relative local-level poverty. If such local poverty persisted and if poverty is correlated with greater (or smaller) incidence of smoking, the historical migration networks may be directly related to differences in smoking incidence today. An ideal solution would be to control for the local-level prevalence of smoking in the Yugoslavia of the 1960s and 1970s. Such data, however, are not available. Instead, we use the 1971 municipality-level illiteracy rate, sourced from the 1971 Yugoslav Population Census, as a proxy for local-level development and smoking in both stages of the instrumental variable estimation.[8]

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[8] It is noteworthy that the illiteracy rate tends to be insignificant in the first-stage regression, which might suggest that local smoking prevalence (as proxied by the level of local-level illiteracy rate) was not a driver of the guest-worker emigration in ex-Yugoslavia. Our overall results remain unchanged if the illiteracy rate is excluded from the analysis.

For the purpose of further validating our instrument's network component, it is helpful to understand the actual reasons behind the local-level variation in the emigration rates of the early 1970s. First, the variation can be shown to relate to the different regional rates of migration that the countries of ex-Yugoslavia experienced at the turn of the 20th century and the interwar period (Baucic 1973a; Brunnbauer 2009). This also illuminates why certain regions of Croatia and the Dalmatian coast of Bosnia and Herzegovina were the first to embrace guest-worker emigration opportunities, exhibiting the highest municipal rates of emigration. These regions were part of the Austro-Hungarian Empire (which had a particularly favourable emigration regime) prior to WWI. These regions also benefited from having access to seaports and, in addition, were subject to agricultural shocks (e.g., the *Phylloxerra* epidemics that destroyed much of the profitable Dalmatian wine industry (Mlinaric 2009; Brunnbauer 2009)). Early emigration from those regions was favoured by the mentioned factors. These factors also contributed to the establishment of strong and persistent cultures of migration.

Another reason for the regional variation in emigration rates can be found in the demand-driven and 'managed' nature of bilateral recruiting and guest worker migration programs. Representatives of prospective host countries' manufacturing companies recruited workers directly, in some cases through the Yugoslav state employment agencies. The distribution of foreign recruiters within Yugoslavia was, however, uneven. For example, manufacturers from West Germany, the most important destination of Yugoslav migrants, recruited workers from specific regions in Yugoslavia, because they had good experience with workers from these regions (Novinscak 2009).

Additional explanation is provided by the documented assumption on the part of both migrants and the political elite that the early guest-worker out-migration from Yugoslavia was temporary. Migrants – often young, low-skilled men with agricultural backgrounds – went abroad to earn money that they planned to invest back home in building/extending houses or buying land and agricultural machinery (Pichler 2009; Novinscak 2009). Return intentions were also confirmed by the fact that the immediate family (spouse, children) were typically left behind by the early migrants, and that property sales at home were rare

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(Brunnbauer 2009). This, again, contradicts a possible conjecture that the guest worker
migration was driven by the extent of smoking at the local level.

All things considered, given the context and the demand-side-managed nature of the guest
worker out-migration in former Yugoslavia, coupled with our use of within-region variation
in migration rates and a control for local-level development at the time of migration, it
appears highly unlikely that the variations in historical local-level migration rates are related
directly to today's local-level incidence of smoking. This makes us confident that the
network component of the network-growth interaction instrument is exogenous to present-
day smoking.

5. RESULTS

5.1. Correlational evidence

Table 3 reports the results of the estimations which do not account for endogeneity. In Panel
A, the focal regressor is the overall migration variable, while Panel B splits it into households
that do and do not receive remittances. Here and in what follows, we report only the result for
the variables of interest; complete econometric output is available on request.

Controlling for other factors, the correlation between the incidence of smoking and the
overall household migration status is positive and significant at the 10% level (Panel A of
Table 3); in terms of marginal effects, people with foreign connection are 2.2 percentage
points more likely to report smoking in the day before the interview. Further subsample
results suggest that this correlation is driven by older respondents, for whom the coefficient is
positive and significant at the 5% level and the corresponding marginal effects of equal to 3.4
percentage points.

Disaggregating the overall migration variable into remittance recipient and non-recipient
households (Panel B of Table 3), it is the respondents from remittance-recipient households
who are more likely to smoke (the marginal effects are approximately 5 percentage points for
the whole sample, women and younger respondents and 7.1 percentage points for older

respondents), while the coefficients of the non-recipient migrant household variable are statistically insignificant across the board.

Table 3. Emigration of household members, remittances, and incidence of smoking among those staying behind, correlational results

	Dependent variable: Smoked yesterday (1 = yes; 0 = no), binary probit coefficients				
	All	Female	Male	Age < =42	Age > 42
PANEL A					
Migrant household	0.059*	0.078	0.037	0.062	0.098**
	(0.031)	(0.052)	(0.048)	(0.052)	(0.047)
Individual controls	Yes	Yes	Yes	Yes	Yes
Country and year FE	Yes	Yes	Yes	Yes	Yes
Observations	12,084	6,327	5,757	6,257	5,827
Prob > Chi2	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.0279	0.0317	0.0126	0.0512	0.0644
PANEL B					
Relatives abroad, no remittances	0.021	0.045	0.000	0.022	0.042
	(0.042)	(0.067)	(0.057)	(0.063)	(0.055)
Remittances	0.131***	0.140**	0.109	0.140**	0.205***
	(0.043)	(0.065)	(0.071)	(0.071)	(0.072)
Individual controls	Yes	Yes	Yes	Yes	Yes
Country and year FE	Yes	Yes	Yes	Yes	Yes
Observations	12,084	6,327	5,757	6,257	5,827
Prob > Chi2	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.0283	0.0320	0.0130	0.0516	0.0651

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors, clustered at the municipality level, in parentheses

5.2. Instrumental variable (IV) results

The results of IV estimations for the smoking incidence models are shown in Tables 4 and 5 4. Starting with the overall migration variable (Table 4), we notice that the instrument performs well in the first stage: the network-growth interaction variable is a positive and significant predictor of migrant household status. The value of the F-test on the excluded instrument, performed after the first-stage estimation, ranges from 10 to 30, depending on the

sample. Values in this range exceed the "rule of thumb" threshold of 10, which can be used to assess weak identification in IV models with clustered standard errors (Baum et al. 2007). The second-stage results of the IV estimation suggest that belonging to a migrant household reduces the incidence of smoking; the coefficient is negative and significant at the 5% level and its marginal effect is equal to 28 percentage points. This result is driven mostly by the sub-samples of women and older respondents, for whom the coefficients are significant at the 1% level and the marginal effects are equal to 35 and 39 percentage points, respectively.

Turning to the effects of remittances, we note that having one instrument (network-growth interaction) for both remittance-recipient and non-recipient migrant households is not conducive to performing IV estimations that jointly include two endogenous regressors. Instead, we run separate IV estimations for recipient- and non-recipient migrant households (Table 5). To make sure that the effect of these variables is obtained by comparing migrant to non-migrant households, the models estimating the effect of receiving remittances exclude migrant households not receiving remittances, and the models estimating the effect of being a non-recipient migrant household exclude remittance receivers. This procedure also ensures that the reference group (non-migrant households) is the same in the non-IV and IV estimations, allowing a comparison of results.

The results suggest that it is mainly the emigration of family members that is *not* followed by monetary remittance transfers that reduces the incidence of smoking among those left behind – the coefficients non-recipient migrant household variable are significant for the whole sample, as well as women and older respondents (Panel A of Table 5). Receiving migrant remittances reduces the incidence of smoking only among women (Panel B of Table 5). We note, however, that due to smaller sample, our instrument performs less well, especially in the male and younger respondent specifications.

Table 4. Emigration of household members and incidence of smoking among those staying behind, instrumental variable results

	Dependent variable: Smoked yesterday (1 = yes; 0 = no), IV probit coefficients				
	All	Female	Male	Age $<=42$	Age > 42
Migrant household	-0.787**	-1.048***	-0.332	0.127	-1.175***
	(0.397)	(0.359)	(0.761)	(0.894)	(0.455)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes
Country and year FE	Yes	Yes	Yes	Yes	Yes
Instrument *Network-growth interaction*					
First-stage coefficient	0.868***	0.942***	0.795***	0.885***	0.841***
	(0.159)	(0.178)	(0.192)	(0.268)	(0.175)
F test of excluded instrument	29.82	27.85	17.01	10.84	23.09
Observations	10,788	9,621	7,803	6,871	10,788
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$, robust standard errors, clustered at the municipality level, in parentheses.

Table 5. Emigration of household members, remittances, and incidence of smoking among those staying behind, instrumental variable results

	Dependent variable: Smoked yesterday (1 = yes; 0 = no), IV probit coefficients				
	All	Female	Male	Age $<= 42$	Age > 42
A. Relatives abroad, no remittances	-0.983*	-1.204*	-0.660	0.354	-1.660**
	(0.573)	(0.633)	(0.856)	(1.055)	(0.684)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes
Country and year FE	Yes	Yes	Yes	Yes	Yes
Instrument *Network-growth interaction*	0.643***	0.637***	0.662***	0.778***	0.558***
First-stage coefficient	(0.157)	(0.184)	(0.201)	(0.255)	(0.172)
F test of excluded instrument	16.68	11.94	10.74	9.24	10.47
Observations	10,788	5,668	5,120	5,529	5,259
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000
B. Remittances	-0.819	-1.327**	0.614	0.473	-1.196
	(0.649)	(0.580)	(2.034)	(1.690)	(0.789)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes
Country and year FE	Yes	Yes	Yes	Yes	Yes
Instrument *Network-growth interaction*					
First-stage coefficient	0.700***	0.910***	0.460**	0.666**	0.688***
	(0.174)	(0.198)	(0.181)	(0.339)	(0.155)
F test of excluded instrument	16.20	21.06	6.42	6.98	10.39
Observations	10,788	9,621	7,803	6,871	10,788
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** p<0.01, ** p<0.05, * p<0.1, robust standard errors, clustered at the municipality level, in parentheses.

6. DISCUSSION AND CONCLUSION

6.1. Discussion of results

Our results have shown that emigration, on the whole, reduces the likelihood of smoking tobacco among migrant household members staying behind. This finding supports Levitt's (1998) 'social remittances' hypothesis – a conjecture that migrants transfer norms and practices from host to home countries. As most migrants from the ex-Yugoslav region go to wealthy industrialised countries, where smoking prevalence tends to be lower and the awareness of smoking-related health risks higher than at home, migrants are likely to act as conduits of healthier norms and behaviours.

We have also found that emigration has a negative effect on the likelihood of smoking only if migrants do not send monetary remittances back home, while the effect becomes statistically insignificant if migrants send remittances back home. Taken together, these findings might lend support for the hypothesis that monetary remittances relax household budget constraints and, tobacco being a normal good, increase the likelihood of smoking – counteracting the beneficial effect from social remittances. We, however, are cautious about making such a claim, as the 95% confidence intervals for the two estimates have a substantial overlap,[9] meaning that the difference between them in statistical sense is likely to be zero.

We have also uncovered some sub-group differences: it is the women and older people (as opposed to men and younger people) whose likelihood of smoking decreases with the emigration of household members. Levitt (2005) argues that, relative to men, migrant women are more successful at adopting the norms and practices of destination countries and transferring them back home. Our results suggest that women may also be more successful recipients of norms and practices of the migrant countries of destination.

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[9] The 95% confidence interval is (-2.11, 0.14) for the remittance-free emigration variable and (-2.09, 0.45) for receiving remittances. Note that we compare confidence intervals here, as it is not straightforward to compare estimated coefficients from regressions based on different samples.

We also note that, for women, the coefficients are statistically significant for both remittance-recipient and non-recipient migrant households, and for older respondents only the non-recipient migrant household variable is statistically significant. It is again difficult to claim that remittances amplify the effect of migration for women (as the point estimate of the remittances variable is higher than that of the non-recipient migrant household variable) and counteract for older respondents (as the point estimate of the remittances variable is lower than that of the non-recipient migrant household variable and statistically insignificant), as the estimates' confidence intervals have substantial overlaps.

While splitting migrant households into remittance-recipient and non-recipient may provide some way into disentangling the social remittances and income channels, testing the emotional distress channel is less straightforward. To understand whether emigration-related emotional distress of those staying behind might be contributing to smoking, we have augmented our models with additional controls capturing the experienced feelings of happiness, sadness, depression, anxiety. The effect of emigration on the likelihood of smoking remained largely unchanged, implying that emotional distress due to the emigration of household members either is not there or, if present, does not make people smoke more.

We also note the discrepancy between the correlational and instrumental variable results. The correlational results reveal a positive association between the emigration of household members (and especially receiving monetary remittances) and the likelihood of smoking, while the instrumental variable results show that the effect of the emigration of household members on the likelihood of smoking is, if anything, negative. The difference could be due to reverse causality – people emigrate because they family members smoke or some unobservable household-level factors driving both emigration of some household members and smoking of those staying behind. When emigration is predicted by factors not-related to smoking (in our case, the intensity of local-level historical migration and the economic growth rates in the migrant destination countries), we obtain a negative effect, likely reflecting the transfer of norms and practices from migrant host to home countries.

Our work is not without limitations – which open directions for future research. First, while our study if the first to provide causal evidence on the effect of household member emigration on the likelihood of smoking of those staying behind, data restrictions have not allowed us to study the effect of emigration on other smoking-related outcomes, such as the number of cigarettes consumed per day, willingness to quit smoking, having quit smoking in the past, as well as suffering from smoking-related deceases. Future research could consider such outcomes and therefore get a more rounded picture of the effects of emigration on smoking of those staying behind. Second, future research could explore the relationship between emigration and smoking from a longitudinal perspective – provided that appropriate data are available. The use of longitudinal data would allow relating the changes in the household migration status to the changes in smoking outcomes for the same people, over time, thereby controlling for unobserved household and individual heterogeneity. Ideally, the longitudinal analysis would be combined with a credible instrument for emigration of household members.

6.3. Conclusion

The purpose of this paper was to investigate whether migration affects smoking behaviour in the migrants' countries of origin. Using data from the Gallup Balkan Monitor survey in instrumental variable analysis, we found that out-migration of family members or close friends reduces the incidence of smoking among those staying behind, especially women and older respondents. These findings lend support for the existence of positive migrant value transfer (social remittances) from host to home countries.

Overall, our findings suggest that migration, through the cross-border transfer of norms and practices, may contribute to socioeconomic development by reducing the driver one of the world's biggest health epidemics: smoking. This suggests that beneficial effect may come from liberalizing travel and communication between migrants and their home countries to facilitate the transfer of normative intangibles; examples of policies that could be considered by decision makers in both destination and origin countries are visa-free travel, double citizenship and incentives for diasporas to interact with home communities.

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Table A1. Definitions of variables and summary statistics (based on the whole sample of 12,084 respondents)

Variable	Definition	Mean	Std. Dev.	Min	Max
Smoker	1 if smoked yesterday, 0 otherwise	0.376	0.484	0	1
Migrant household	1 if 1 if have relatives or friends living in another country (outside the borders of former Yugoslavia) whom can count on to help when in need (including remittance receivers), 0 otherwise	0.311	0.463	0	1
Relatives abroad, no remittances	1 if have relatives or friends living in another country (outside the borders of former Yugoslavia) whom can count on to help when in need, excluding remittances receivers, 0 otherwise	0.204	0.403	0	1
Remittances	1 if, in the past 12 months, household received help in the form of money or goods from another individual living in another country, 0 otherwise	0.107	0.309	0	1
Age	Age in years	42.747	16.960	15	99
Female	1 if female, 0 if male	0.524	0.499	0	1
Primary education	1 if primary education, 0 otherwise	0.194	0.395	0	1
Secondary education	1 if secondary education, 0 otherwise	0.565	0.496	0	1
Tertiary education	1 if tertiary education, 0 otherwise	0.216	0.411	0	1
Education non-reported	1 if education non-reported, 0 otherwise	0.025	0.157	0	1
1st income quintile	1 if 1st income quintile (within country equalised household income, OECD equivalence scale), 0 otherwise	0.141	0.348	0	1
2nd income quintile	1 if 2nd income quintile (within country equalised household income, OECD equivalence scale), 0 otherwise	0.149	0.356	0	1
3rd income quintile	1 if 3rd income quintile (within country equalised household income, OECD equivalence scale), 0 otherwise	0.157	0.364	0	1
4th income quintile	1 if 4th income quintile (within country equalised household income, OECD equivalence scale), 0 otherwise	0.160	0.367	0	1
5th income quintile	1 if 5th income quintile (within country equalised household income, OECD equivalence scale), 0 otherwise	0.169	0.375	0	1
Income non-reported	1 if income not reported, 0 otherwise	0.223	0.416	0	1
Farm/rural area	1 if lives in farm/rural area, 0 otherwise	0.196	0.397	0	1
Small town/village	1 if lives in small town/village, 0 otherwise	0.442	0.497	0	1
Suburb of a large city	1 if lives in a suburb of a large city, 0 otherwise	0.052	0.223	0	1
Large city	1 if lives in a large city, 0 otherwise	0.298	0.457	0	1
Degree of urbanization non-reported	1 if degree of urbanisation not reported, 0 otherwise	0.012	0.108	0	1
Orthodox	1 if Orthodox, 0 otherwise	0.465	0.499	0	1
Catholic	1 if Catholic, 0 otherwise	0.213	0.410	0	1
Muslim	1 if Muslim, 0 otherwise	0.276	0.447	0	1
Other religion	1 if other religion, 0 otherwise	0.046	0.209	0	1

Serbia	1 if lives in Serbia (excluding Vojvodina), 0 otherwise	0.166	0.372	0	1
Bosnia and Herzegovina	1 if lives in Bosnia and Herzegovina, 0 otherwise	0.166	0.372	0	1
Croatia	1 if lives in Croatia, 0 otherwise	0.169	0.375	0	1
FYR of Macedonia	1 if lives in FYR of Macedonia, 0 otherwise	0.163	0.370	0	1
Montenegro	1 if lives in Montenegro, 0 otherwise	0.165	0.371	0	1
Kosovo	1 if lives in Kosovo, 0 otherwise	0.171	0.376	0	1
Vojvodina	1 if lives in Vojvodina, 0 otherwise	0.043	0.202	0	1
Share of illiterate people in municipality, 1971	Share of illiterate people in the municipality in 1971; source: the Yugoslav Population Census of 1971.	18.551	9.082	2.923	40.992
Year 2011	1 of year 2011, 0 if year 2010	0.500	0.500	0	1
Network-growth-interaction	For each municipality: the summation of average 2001-2005 GDP growth rates of major migrant destinations weighted by 1971 migrant networks (the number of 1971 migrants relative to municipality population in 1971) in these destinations.	0.034	0.035	0.004	0.307