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Segmented Paths of Welfare Assimilation

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Abstract

This paper investigates the extent to which first-generation immigrants in the Netherlands undergo segmented paths of welfare assimilation and its underlying mechanism. Using unique longitudinal panel administrative data (2007-2015) based on the entire Dutch population from Statistics Netherlands (CBS), we estimate the trajectories of immigrant welfare utilization over the working-age life course, which is employed as an indicator of economic marginalization, vis-à-vis those of two base groups from the native populations representing different economic segments of the host country, namely: average Dutch natives and Dutch natives with low education level. The results show that, while mainstream assimilation is the dominant trend, it is not a common path for all. The risk of persistent marginalization exists and concentrates among first-generation immigrants characterized by structural and human capital disadvantages, despite their aspiration to integrate and notable degrees of upward mobilities. The worst scenario projected is a lack of assimilation to neither segment, suggesting prospective emergence of an ethnic underclass at the bottom of the economic ladder. The main policy implications are twofold. First, automatic closing of the immigrant-native gap over time should not be presumed if a level playing field is not provided for all regardless of their type of immigration and ethnic background. Second, the need for distinction between immigration policy and refugee policy should not be obscured by the consolidation of immigrants as one homogenous group, as systematic discrepancy is being observed between refugees and other types of migrants in both the patterns and mechanisms of welfare assimilation.

JEL Codes: H53, J6, I38, C23, J15

Keywords: welfare assimilation, segmented assimilation, first-generation immigrants, dynamic correlated random effects probit model

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1. Introduction

Immigration has emerged as one of the defining themes in the 2019 Dutch election where an unprecedented surge in populist parties materialized. In 2019, over 4 million people with a migration background resided in the Netherlands, comprising 23% of the total population. Despite contentious public discourse on the extent of the immigrant-native gap in welfare utilization, which has profound policy implications with respect to the economic consequences of immigration, as well as the effectiveness of socio-economic integration of immigrants and their children, relevant scientific knowledge remains scant (Van de Beek, 2010). On one hand, the lack of disaggregation in existing evidence has obscured the vast heterogeneities of the immigrant populations. On the other hand, the documentation of over-representation of non-western immigrants in welfare figures (e.g. CBS, 2016; Zorlu, 2013; SCP, 2009; SCP, WODC & CBS, 2005) and the attribution of migrants' fiscal burden on the host country to their welfare costs (Roodenburg, Euwals & Rele, 2003) have been based, exclusively, on cross-sectional and/or static analysis.

The shortcomings of such methodologies have been well documented in the literature. On one hand, cross-sectional analysis of welfare use is subject to estimation biases, as identification of the effects of aging, cohort, period and selective remigration from assimilation effect is difficult if not impossible (see e.g. Borjas, 1994). On the other, initial labour market outcomes of migrants have been shown to be a poor approximation of their ultimate position in the future (Chiswick et al., 2005). Even with panel data, static models fail to capture dynamic processes (Akay, 2016) although they are used in most economic assimilation studies. The dynamic life-course approach, while avoiding such severe biases, brings to attention a question pivotal to the understanding of immigrant welfare use: Does immigrants' welfare utilization level converge to that of natives over time? If their utilization level will change with time spent in the country, the initial costs of welfare should therefore not be used alone to infer the lifetime welfare costs of immigrants (Hansen & Loftstrom, 2003).

Existing research on welfare assimilation, as part of the broader process of economic assimilation, has yet to provide a uniform and conclusive answer to this question. With the majority of studies conducted in the American context, evidence on welfare assimilation is scarce for Europe and absent for the Netherlands. Most existing studies, guided by the immigrant assimilation hypothesis (IAH), dedicated almost exclusive attention to the effects of years since migration (YSM) (Chriswick, 1978) and human

capital (Borjas, 1985) for explaining post-migration experiences. The intuition behind this reasoning is that the longer immigrants reside in the host country, the more they accumulate skills, knowledge and experience specific to the destination country to improve their labour market position and lessen the use of social benefits. In other words, welfare and economic assimilation, meaning a trend of upward mobility towards average natives, is a natural process that should take place over time. However, empirical evidence seldom aligns with such predictions, as persistent differences in the economic integration outcomes of non-western immigrants has been consistently observed across country contexts even after 20 years of residence (e.g. Akay, 2016, 2007; Hansen & Loftstrom, 2003). While successful economic and welfare assimilation achieved by western immigrants in host countries can be quite well explained, the theory appears insufficient for explaining the lack of assimilation.

Segmented assimilation theory, first put forward by Portes & Zhou (1993), offers new perspectives pointing to the potential diversity of the assimilation process. Diverting from the traditional view of a uniform assimilation process, it stresses that the relationship between YSM and assimilation depends on which segment of the stratified host society immigrants are incorporated into. For the first generation, differences in modes of incorporation in the receptive context and human capital are deemed decisive to whether assimilation to the middle class is achievable. This can perhaps extend our current understanding of welfare and economic assimilation and make sense of the empirical findings, especially regarding the observed divergence from average natives and the role of factors other than duration and human capital.

These have led us to pose three research questions. *First*, do first-generation immigrants undergo segmented paths of welfare assimilation over the working-age life course instead of a uniform path of mainstream assimilation? *Second*, are the prospects of upward mobility exclusive of the disadvantaged groups? *Third*, to what extent do structural and human capital disadvantages, namely a negative mode of incorporation and a low level of human capital, predict marginalization in spite of migrants' aspiration to integrate?

According to the classification of persons with a foreign background (CBS, 2001), first-generation immigrants are defined as those who are born abroad with at least one parent born abroad, and Dutch natives are those with both parents born in the Netherlands. We will make use of longitudinal administrative data (2007-2015) based on the entire Dutch

population from Statistics Netherlands (CBS) to simulate the welfare assimilation trajectories for the immigrant populations by their area of origin, entry category, education level and gender.

In this paper, the analysis of assimilation is confined exclusively to the economic domain due to the explicit focus of this research on predicting and explaining welfare assimilation. Economic assimilation and welfare assimilation refer to the speed and extent of reduction in the immigrant-native gap in economic outcomes and welfare utilization propensity respectively. The base groups for different assimilation outcomes will be discussed in Section 2.3.

This research provides the first longitudinal evidence on welfare assimilation for the Netherlands. From a theoretical perspective, it provides an alternative means of operationalization and empirical evidence on the first generation for segmented assimilation theory when most, if not all, studies of segmented assimilation have focused on the children of immigrants. Moreover, through bridging the economics and sociology literatures on immigrant integration, it complements the descriptive and explanatory functions of conventional welfare and economic assimilation models. From a methodological perspective, through undertaking a dynamic life-course approach, it addresses the shortcomings of static and snapshot analysis of welfare use.

The paper is structured as followed: the institutional background will be first outlined, followed by literature review and conceptual framework. Data description, methodology and empirical results from the data analysis will then be presented. The paper will conclude with robustness check and discussions on the findings.

2. Literature Review

2.1 Conceptual Framework: Bridging the Theoretical Approaches

Various approaches have been advanced from economics and sociology to study immigrant adaptation in the host country, from which we have identified three competing models for our study of welfare assimilation. Similarities and differences in their descriptive and explanatory functions will be discussed, with the goal to incorporate insights from existing models to formulate our hypotheses. Table 1 summarizes the main theories of the models.

Table 1: Competing models on economic assimilation

Competing model	Discipline	Major determinant(s)	Predicted patterns of assimilation
Classic assimilation theory	Sociology	YSM	Straight-line, or at most bumpy, assimilation to the mainstream of host society
Immigrant assimilation hypothesis (IAH)	Economics	YSM, conditioned by human capital	Immigrants with higher human capital assimilate more quickly to average natives
Segmented assimilation theory	Sociology	Modes of incorporation	Upward assimilation to the middle-class or downward assimilation to the underclass

Source: Authors' compilation.

As pioneer of assimilation theories in the sociology literature, the "classic assimilation model" dates back to the 1920s as sociologists of the Chicago School sought to understand the incorporation of European immigrants and their descendants in the U.S.. The model focused on the role of *Years Since Migration*, and the theory predicted a uniform straight-line process of upward assimilation towards the mainstream over time (Park & Burgess, 1925). Convergence was assumed an inevitable destination for all immigrants and their children (Waldinger & Perlmann, 1998).

However, fundamental changes in the American society have brought the classic model into question regarding its applicability to the contemporary world (e.g. Greenman & Xie, 2008; Portes & Rumbaut, 2001; Rumbaut, 1997; Portes & Zhou, 1993). On one hand, the composition of immigrant inflow to the U.S. before and after the WWII substantially differs. White European immigrants, who share relatively similar characteristics and skill levels as the native population, have been increasingly replaced by migrants from markedly diverse backgrounds – they are different not only in ethnicity, but also the type and amount of human capital they possess. On the other hand, economic restructuring gave rise to an hourglass economy with a bifurcated labour market, which has become arguably less receptive to immigrants (Portes & Fernández-Kelly, 2008; Portes & Zhou, 1993). The model has been mainly criticized for its inability to explain the widening gap in the levels of opportunities and disadvantages between recent immigrant cohorts and the natives. Recent development of the theory (e.g. Alba & Nee, 2003) has come to recognize that the assimilation path is not a straightforward one, and could be bumpy and lengthy for some but could nonetheless ultimately converge to the mainstream.

The second model, the immigrant assimilation hypothesis (IAH) from the economics literature, also emphasizes the effect of YSM on economic adaptation, but that such effect is conditioned by the amount of human capital (Chiswick, 1978), in particular destination-

specific human capital (Chiswick, 2002). Upon arrival, an initial immigrant-native wage gap is anticipated, since their pre-migration skills, such as language and qualifications, are not directly transferable to the host country. As time passes, immigrants improve their host-country-specific skills and close the wage gap from natives. The immigrant-native gap might not be closed, however, if a relevant knowledge deficiency, namely under-investment in destination-specific human capital, or discrimination against non-natives persists in the host country. In other words, the role of factors other than human capital, including structural or societal factors, can at best influence the extent of upward assimilation. In this perspective, the role of YSM is decisive to economic assimilation insofar it influences the accumulation of destination-specific human capital.

Despite variations, these two models share two similar assumptions: a positive relationship between YSM and assimilation, and the prediction of mainstream assimilation via upward mobility. However, with the increasing availability of data on the offspring of recent immigrants, the empirical observations of persistent differences in assimilation outcomes concentrated among certain immigrant groups have cast doubts on the descriptive and explanatory power of these models (see e.g. Hirschman, 2001; Gibson, 1997; Waters, 1996). Given equal residential duration as the children of natives, second-generation immigrants are supposed to achieve comparable levels of education and labour market outcomes. Why do some groups of immigrant children tend to have worse education outcomes, and why, even given the same level of education, some groups of immigrant children have worse labour market outcomes than the children of natives? This points to the possibility that more complex societal and structural mechanisms underlie this process of economic assimilation.

Segmented assimilation theory, an alternative theoretical perspective, confronts the classic models with the fundamental challenges that assimilation might not a uniform process for all immigrants and their children, and that the relationship between YSM and assimilation is not necessarily positive depending on the segment of society to which immigrants assimilate (Bankston & Zhou, 1997; Zhou, 1997). As immigrants arrive at the host society, which is stratified into segregated and unequal segments thanks to increasing labour market bifurcation, assimilation is essentially the process in which they are absorbed into these different segments. The path of assimilation thus divides not only in terms of the extent and pace of assimilation, but also the direction and destination. While some migrant groups will follow the rosy route of upward assimilation and join

the middleclass, the more disadvantaged will however be cut off from economic mobility and experience downward assimilation into the underclass.

Instead of asserting a deterministic role to individual-level dynamics as in the classic models, segmented assimilation theory posits that it is the interplay between structural, societal and individual factors that will decide the fate of immigrants and their children. For first-generation immigrants, structural factors particularly the modes of incorporation are the most deterministic, which refer to the reception by the government and host community. If unfavourable policies and/or prejudice towards certain minorities exist(s), their upward mobility is likely to be hindered. On the contrary, favourable reception, well-crafted inclusive integration policies, and capital spillover could promote the emergence of new communities where participating minority groups become resilient, thus offering a middle-range pathway to mainstream assimilation for those facing negative modes of incorporation (Nimeh, 2012).

On one hand, the segmented assimilation theory offers a new perspective to our descriptive understanding of the immigrant adaptation process by differentiating between the destination of assimilation and the path of assimilation. The current understanding about how much and how fast assimilation takes place can be broadened to take into account "assimilation into which reference population" (Tran, 2016). On the other hand, although it sheds lights on the importance of opportunity structure on immigrant integration, it comes with the deficiency of neglecting the agency of immigrants. As Lutz (2017) puts it, immigrant integration is a product of immigrant capacity and immigrant aspirations. While the institutions will determine the amount of opportunities available, such personal aspirations or incentives will decide the extent to which such opportunities are utilized and translated into actual and observable progress of economic and welfare assimilation.

2.2 Empirical Evidence on Welfare Assimilation

In the following section, existing evidence on the patterns and explanatory factors of welfare assimilation will first be presented. We will then outline the research gap which this study intends to fill.

Developed upon the literature on earning assimilation of immigrants in the U.S. pioneered by Chiswick (1978), alongside studies on other economic assimilation

outcomes such as employment and occupational level (e.g. Kaushal et al., 2016; Waters Gerstein Pineau, 2016), the estimation of immigrant welfare assimilation in the destination countries became popular in recent decades, primarily due to increasing data availability. With the majority of welfare assimilation studies conducted in the American context, the literature has yet to identify a consistent pattern. Jensen (1988) shows that, once individual and family characteristics which shape the needs and eligibility for public assistance are controlled for, immigrant households are significantly less likely to receive cash benefits than native households. However, Borjas & Hilton (1996) draw the opposite conclusion when other means-tested non-cash benefits such as housing subsidies, food vouchers and Medicaid are also considered. Such diverse conclusions shed light on the heterogeneities in the nature, eligibility and receipt patterns across welfare programs, and hence the importance of welfare definition according to one's research purpose.

To the best of our knowledge, there has been no study on welfare assimilation in the Dutch context. Although the subject of welfare assimilation has not received the same degree of academic attention in the Netherlands, a descriptive report has touched upon the issue. The 2016 Integration Report (CBS, 2016) measures the proportion of people among selected refugee groups and immigrants from new EU member countries in receipt of social assistance by years since migration. For refugees, the utilization rates tend to increase until 6 years of stay and decrease with longer stay. For non-refugee immigrants from new EU member countries, an increasing trend with years since migration is observed. To draw reference from the limited European literature on immigrant welfare assimilation, empirical evidence has been provided for Sweden, Finland, Denmark, Norway, and Germany as shown below. The general finding is a decreasing trend of welfare utilization over time among first-generation immigrants, particularly salient among refugees who arrived with higher initial levels, although parity with the predicted levels of natives is a rare case. Such patterns found in the European context provide a tentative indication of potential segmentation among first-generation immigrants.

In the case of Sweden, Hansen and Lofstrom (2003) examine whether immigrants assimilate into or out of welfare and find a decrease in immigrant social assistance participation propensity with time spent in the country, although immigrants use social assistance to a larger extent than natives. Refugees decrease their social assistance utilization at a faster rate than non-refugee immigrants, but neither groups were predicted to reach parity with natives within the 20-year observation period.

For Finland, Sarvimäki (2011) examines assimilation patterns in terms of receipt of income transfers (social assistance, housing allowance, unemployment benefits and other), annual earnings and employment outcomes. High initial immigrant-native differences in earnings and employment are found among female immigrants and immigrants from non-OECD countries. Convergence to the native level is found in the use of social benefits after 20 years of residence in the country, despite persistent differences in employment and earnings.

In the Danish case, Blume and Verner (2007) examine the welfare dependency rate of immigrants, which is measured by the amount of public transfers received including pensions, social assistance, unemployment insurance benefits, child benefit and public housing support as a share of one's total income. While assimilation out of welfare is observed, such reduction is stronger for migrant men than women, who are also more sensitive to the effects of business cycle. Immigrants from later arrival cohorts show higher welfare dependence, partly due to the large variations in cohort qualities.

For Norway, Ekhaugen (2005) specifically takes into account the possibility of selective re-migration and benefit substitution. Considering the potential sensitivity of results to an overly narrow definition of welfare due to the likely presence of program substitution, this study examines receipiency of social assistance, unemployment benefit, disability pension, sickness benefit and rehabilitation benefit. By comparing refugees and other non-western with western immigrants, the author finds that welfare assimilation is observed for refugees but the opposite for other non-western immigrants.

For Germany, Riphahn, Sander & Wunder (2013) compare the probabilities of receiving social assistance and unemployment benefits between Turkish immigrants and the natives. After controlling for individual and household characteristics, only the second generation of Turkish immigrants remains significantly more likely to use welfare.

While existing studies have provided an important base for understanding the welfare assimilation process, much of the knowledge gap remains. First of all, existing evidence for the Netherlands are purely descriptive. Potential biases cannot be appropriately accounted for, such as the effects of selective re-migration, business cycles, aging and cohort quality changes. Second, the observation period of existing Dutch studies is too short to shed light on the long-term assimilation trend. Third, the focus on refugees and the broad distinction between western and non-western immigrants leave the aggregate

picture of welfare assimilation of all first-generation immigrants unknown. This study thus aims to complement the research gap by disentangling intra-group differences.

2.3 Operationalization: Defining base groups for segmented assimilation

According to Portes, Fernandez-Kelly & Haller (2007), to disapprove the segmented assimilation theory one has to demonstrate the non-existence or insignificance of downward assimilation. One common approach is to select indicators of downward assimilation and compare the distribution among immigrants by their countries of origin. If the differences in the downward assimilation indicator, which is welfare utilization in our case, are randomly distributed among immigrant groups regardless of their average human capital and background characteristics, the number of success stories and failures in each group should approximate and thus there is no need to worry about downward assimilation. However, if such differences are concentrated in some groups, we cannot reject the existence of (an) alternative path(s) to upward assimilation.

There are two problems concerning such operationalization. Given that this methodology was designed to test segmented assimilation among second-generation immigrants, it has limited applicability to first-generation immigrants, among whom differences are expected due to substantial variations across YSM. The second problem is that it lacks specificity with regards to testing the core theoretical assumption, namely, the existence of downward assimilation into the underclass. While concentrated differences can be observed, the comparison is being made only among statistically similar migrants, but not with any reference group from the native population. The consequent lack of solid empirical evidence led to widespread skepticism centered on two issues: (i) the existence of an alternative assimilation process, which is the first thing to be tested in this research, and (ii) whether the reference group for the alternative path is the underclass, which remains controversial as to whether it exists, whether it is relevant to societies outside of the American context, and whether it is possible to define such a class.

Such a methodological loophole is fundamentally embedded in the elusive nature of the underclass concept. From a broader perspective, class per se, as Bourdieu (1987) puts it, is not an actual group, but rather a construct or a 'probable group' characterized by similar positions, conditions and interests, and consequently similar stances and practices. Not to mention underclass, which is an even more vague concept considering

the highly mixed perspectives of what constitutes an underclass. In the American context where the theory originates, the underclass concept was directly associated with a group of African-Americans living in ghettos who are cut off from upward mobility, live in poverty, or even involved in criminal activities. Many argue that such an underclass concept may not be relevant to other societies, such as Europe where religion appears a more prevalent social divide than race (see, for example, Song, 2004). As for the Netherlands, Roelandt & Veenman (1992) conclude that there is no clear proof for the existence of an ethnic underclass, although marginalization is observed for ethnic minorities who might be at risk of becoming an underclass. It is therefore important to reflect on what an underclass means as a concept as well as in the context of segmented assimilation theory, and whether it remains relevant to contemporary societies and to the Dutch context.

Two aspects require attention with regards to the definition. First, while many sociologists associate underclass with dysfunctional behaviours, we agree with Aponte (1990) that the definition of underclass should be based on deprivation, not behaviour, primarily due to the conceptual undesirability to differentiate between 'deserving' and 'undeserving' poor, and secondarily due to the methodological flaw of endogeneity between behaviour and outcome. As such, we follow Aponte (1990) in defining underclass as the economically marginalized who remain at the bottom end of the socioeconomic ladder with dim prospects for intragenerational and intergenerational upward mobility. The most proximate group to this definition in the Dutch society is essentially the working class.

The literature of social stratification has provided two main options for measuring socio-economic status: composite and proxy measures, the choice of which depends largely on data availability and purpose of research. Common proxies and indicators include income, wealth, education, occupation, and area-level indicators. While income and wealth appear at first glance tempting due to their popularity in the definition of upper-, middle-, and lower-class, they are not feasible options in the context of our research. Besides the apparent disadvantages that they are highly subject to underreporting and substantial variations across life course, they are endogenous to welfare utilization. While use of welfare is heavily dependent on income or wealth, they may also influence the decision of welfare utilization, such as via influencing the number of hours worked.

After eliminating the option of monetary measures, we have three other options of proxy measures: education, occupation and area-level indicators. An example of area-level indicators is average income in the neighborhood. It can be particularly useful in highly segregated societies such as the U.S., but not necessarily to the Dutch context. Adding to that, the definition of neighborhood is an arbitrary choice, difficult to operationalize and focuses on the community level. Without precise measurement of occupational level, we deem education a preferable option in the context of this research, firstly due to data availability on the highest level of education obtained, secondly due to its higher consistency throughout the life course, and thirdly due to its function as a proxy also for occupational qualification and income. Across disciplines, education has been uniformly perceived to be a good proxy for socio-economic status through its major influence on occupation and consequent amount of economic resources. In the theory of Bourdieu in the sociological literature, there is a strong relationship between educational attainment and occupational outcome which in turn determines one's social class. In the human capital theory (see Becker, 1964) from economics, education is a critical form of human capital that determines one's earning. While we recognize the existence of labour market mismatch and depreciation of human capital in the job market which are valid concerns particularly for individuals with higher levels of education as well as heterogeneous returns to human capital, our focus is to utilize low level of education as a proxy for economically marginalized position. In the Dutch statistical definition, low education level refers to incompletion of basic compulsory education. That is, incompletion of level 2 of MBO (secondary vocational education), incompletion of HAVO (senior general secondary education) or VWO (pre-university education), or any level below.

A final point to note is the conceptual difference between mobility and assimilation. We refrain from using the terms downward and upward assimilation in this research as they tend to stir up confusions about two distinct concepts: mobility and assimilation. Mobility is in relation to one's initial position. Upward mobility does not necessarily equate achievement of mainstream assimilation – one can arrive with a high initial gap from natives and manage to reduce it substantially over time yet remain marginalized, and vice versa. We therefore treat destination of assimilation and mobility path as two distinct elements in our main analysis which would complement our understanding of the assimilation process from different angles.

Taking these into account, we formulate the following descriptive and explanatory hypotheses based on our conceptual framework: in terms of patterns, the welfare assimilation process is segmented into two paths: assimilation into the middle class and assimilation into the working class. We define assimilation into the working class as convergence towards Dutch natives with low level of education. Assimilation to the middle class is defined as convergence towards Dutch natives with an average level of education, who represent the mainstream of host society.

With regards to the determinants, the interplay between structural, societal and individual factors will commonly decide their welfare assimilation outcomes. Mainstream assimilation can be occur due to, at the macro level, positive modes of incorporation in the receptive context, which can be captured by the variables area of origin and entry category, as they respectively reflect attitudes towards immigrant groups with varying degrees of ethnic and cultural distinctions, and differential immigration policies towards various types of migrants. Specifically, immigrants with a western background and economic/skilled migrants (i.e. labour migrants and education migrants) are predicted to receive the most favourable reception.

At the meso level, ethnic spillover through the presence of co-ethnics at the local level would support their economic and consequently welfare assimilation in spite of negative modes of incorporation. At the individual level, human capital and the aspiration for integration would contribute positively to welfare assimilation. The former will be captured by their education level, and the latter will be proxied by whether the immigrant has naturalized. Since we have no data on their Dutch language skills and cultural attitudes, naturalization indicates the willingness to become integrated into the Dutch society. Although the requirements for naturalization stated in the Dutch nationality laws had changed from rather lenient to strict from 1984 to 2003, one requirement that applied most of the time is that to claim Dutch citizenship one's foreign nationality has to be renounced if possible. Since 2003, passing a naturalization test is required to demonstrate a sufficient level of integration through knowledge of the Dutch language and society. As such, citizenship acquisition also indirectly reflects the Dutch language proficiency of more recent cohorts.

3. Data and Methodology

3.1 Data Description

Our dataset comes from the Social Statistical Database (SSB) of the Statistics Netherlands (CBS). The SSB, constructed mainly from register data and complemented by survey data from Labour Force Survey (EBB), covers everyone legally residing in the Netherlands. The samples consist of random 20% of all first-generation immigrants (354,400 individuals and 1,768,361 observations) and random 1% of all Dutch natives (85,773 individuals and 507,589 observations) aged 18-64 who were registered at the municipality in the period between 2006 and 2015. The decision to draw such random subsamples is due to the enormous number of observations across the 9-year observation period if the original dataset comprising over 10 million people per year is to be covered in the estimation sample. The final sample excludes individuals aged above 60 to avoid contamination from usage of welfare programs as an early retirement pathway. The use of unbalanced samples allows selectivity of remigration to be controlled for (Dustmann & Gorlach, 2015). Descriptive statistics of key variables can be found in Table 2 below.

3.2 Variable Definitions

The dependent variable is *welfare use*, i.e. whether an individual has received welfare (social assistance or unemployment benefit) in that year. Given the research objective to test for existence of an alternative path to mainstream assimilation, this dependent variable is seen as an indicator of economic marginalization. These five programs are selected due to their indication of a lack of self-sufficiency. Other welfare programs available for the working-age populations such as disability benefit and universal schemes have been ruled out due to their incompatible nature.

We recognize that the nature of social assistance and unemployment benefit is not equivalent, with the former as a safety-net measure and the latter a social insurance. In view of this, we demonstrate regression outputs separately for the dependent variables (i) receipt probability of all five programs (will be referred to as welfare receipt) and social assistance receipt probability. For the assimilation profiles, we focus on the composite welfare measure to ensure robustness of the results for several reasons. Firstly, this avoids estimation problems arising from over-concentration of zeros in the dependent variable.

Table 2: Mean values of dependent and independent variables by regional origin

	All migrants	EU	Other Europe	MENA	Sub-Saharan Africa	Asia	Americas & Oceania	Suriname & Caribbean	Dutch natives
Social assistance receipt status	0.130	0.033	0.135	0.235	0.262	0.063	0.050	0.135	0.023
Unemployment benefit receipt status	0.039	0.037	0.041	0.032	0.048	0.029	0.029	0.048	0.029
Lagged welfare receipt status	0.158	0.064	0.167	0.255	0.292	0.085	0.071	0.172	0.047
Initial welfare receipt status	0.143	0.009	0.006	0.022	0.055	0.008	0.004	0.011	0.001
Area of origin									
EU	0.212								
Other Europe	0.157								
MENA	0.195								
Sub-Saharan Africa	0.068								
Asia	0.113								
Americas & Oceania	0.039								
Suriname & Caribbean	0.216								
Entry category dummies (as of 1995)									
Family migrant	0.185	0.118	0.255	0.253	0.204	0.226	0.268	0.097	
Asylum migrant	0.065	0.002	0.051	0.156	0.221	0.026	0.002	0.038	
Labour migrant	0.118	0.376	0.044	0.022	0.057	0.098	0.155	0.026	
Education migrant	0.043	0.048	0.027	0.018	0.049	0.117	0.096	0.021	
Share of highly educated co-nationals	8.956	12.325	6.006	7.198	5.727	12.344	13.320	7.646	
Number of co-nationals at municipality	2.180	1.068	3.613	2.531	0.333	0.574	0.185	3.742	
YSM	16.538	13.612	17.678	17.499	15.599	15.586	14.402	19.431	
Age at migration	23.797	26.631	23.073	22.239	22.945	25.989	24.964	22.663	
Naturalization dummy	0.617	0.242	0.637	0.742	0.594	0.597	0.501	0.899	
Remigration dummy	0.083	0.141	0.058	0.045	0.109	0.095	0.143	0.060	
Entry cohort									

Before 1995	0.555	0.376	0.606	0.537	0.442	0.506	0.419	0.802	
1995-2000	0.113	0.079	0.125	0.191	0.130	0.096	0.097	0.075	
2001-2005	0.121	0.108	0.146	0.155	0.181	0.124	0.143	0.061	
2006-2010	0.119	0.243	0.074	0.071	0.165	0.154	0.187	0.041	
2011-2015	0.092	0.194	0.048	0.046	0.083	0.120	0.153	0.021	
Female dummy	0.526	0.550	0.517	0.463	0.474	0.573	0.603	0.543	0.493
Education level									
Low	0.213	0.106	0.282	0.288	0.309	0.160	0.118	0.212	0.106
Middle	0.198	0.176	0.156	0.203	0.200	0.151	0.177	0.271	0.268
High	0.114	0.145	0.081	0.096	0.081	0.136	0.178	0.109	0.196
Unknown	0.475	0.573	0.481	0.414	0.410	0.553	0.528	0.408	0.430
Household type									
Single-person	0.229	0.285	0.133	0.183	0.338	0.220	0.259	0.252	0.165
Unmarried couple without kids	0.083	0.149	0.040	0.038	0.080	0.083	0.133	0.081	0.100
Unmarried couple with kids	0.074	0.085	0.048	0.043	0.094	0.065	0.077	0.106	0.085
Married couple without kids	0.103	0.128	0.111	0.072	0.055	0.162	0.139	0.081	0.145
Married couple with kids	0.380	0.276	0.563	0.540	0.219	0.387	0.286	0.271	0.428
Single-parent	0.108	0.063	0.091	0.090	0.182	0.066	0.090	0.184	0.064
Other household	0.014	0.010	0.009	0.026	0.015	0.011	0.009	0.013	0.006
Institutional household	0.009	0.006	0.005	0.009	0.018	0.006	0.007	0.013	0.008
Observation year									
2008	0.118	0.103	0.123	0.119	0.113	0.122	0.118	0.125	0.127
2009	0.121	0.110	0.124	0.121	0.118	0.125	0.117	0.126	0.127
2010	0.123	0.116	0.125	0.124	0.123	0.127	0.120	0.127	0.127
2011	0.125	0.122	0.126	0.125	0.127	0.127	0.123	0.127	0.126
2012	0.127	0.128	0.126	0.126	0.128	0.127	0.128	0.126	0.125
2013	0.127	0.134	0.126	0.126	0.129	0.125	0.130	0.124	0.124
2014	0.128	0.140	0.125	0.128	0.130	0.123	0.133	0.123	0.123
2015	0.131	0.148	0.124	0.131	0.132	0.122	0.138	0.121	0.122
Province									
Groningen	0.022	0.028	0.017	0.015	0.025	0.026	0.022	0.024	0.039

Friesland	0.014	0.016	0.007	0.013	0.017	0.021	0.012	0.014	0.042
Drenthe	0.010	0.012	0.007	0.010	0.014	0.013	0.009	0.009	0.033
Overijssel	0.042	0.037	0.077	0.041	0.037	0.042	0.032	0.025	0.073
Flevoland	0.034	0.021	0.018	0.036	0.035	0.034	0.030	0.059	0.022
Gelderland	0.073	0.075	0.096	0.074	0.070	0.081	0.058	0.052	0.129
Utrecht	0.070	0.056	0.068	0.111	0.065	0.061	0.067	0.054	0.077
North-Holland	0.237	0.223	0.215	0.251	0.236	0.244	0.342	0.232	0.146
South-Holland	0.320	0.264	0.323	0.295	0.346	0.283	0.297	0.411	0.189
Zeeland	0.016	0.036	0.010	0.008	0.011	0.015	0.009	0.010	0.023
North-Brabant	0.111	0.136	0.123	0.102	0.111	0.130	0.082	0.081	0.159
Limburg	0.051	0.098	0.039	0.045	0.034	0.051	0.040	0.028	0.068
Provincial unemployment rate	1.740	5.805	1.729	1.733	1.747	1.726	1.747	1.746	1.712
Number of observations	1,768,361	374,998	276,774	344,368	120,657	200,638	68,652	382,174	580,834
Number of individuals	359,778	94,313	48,509	61,077	24,778	45,261	16,749	69,153	85,786

This is the case when unemployment benefit receipt alone is used as the dependent variable although not for social assistance receipt. Secondly, it is important to take into account the possibility of benefit substitution (Ekhaugen, 2005), which could lead to misleading conclusions disregarding the complementarity of welfare programs. Among programs of similar nature, switching from one to another is found to be a common practice in Norway (Nordberg & Røed, 2002). Thirdly, it is known that the distribution of recipiency varies across programs in the Dutch context where migrants, compared to natives, are usually found to overrepresent in social assistance receipt but vice versa in unemployment benefit receipt. For example, by the end of 2015, the percentage of Dutch natives among social assistance recipients is 38% and 74% among unemployment benefit recipients. Since the predicted assimilation outcome is completely dependent on the native utilization level in that particular program, the comparison would give an overly, and falsely, pessimistic estimation when considering social assistance alone.

Information on migration characteristics such as YSM and entry category is only available for migrants who arrived as of 1995, who account for approximately 40% of the sample. As the maximum observable YSM is 21+ and the maximum age in the sample is 60, the variable age at migration which is calculated from age minus YSM can only be deducted by 21 for immigrants with YSM above 21 years. Since entry category is fixed but the type of residence permit is changeable, its interpretation retains to whom they enter as and for those arriving after 1995. Ethnic capital is summarized by the share of the highly educated among co-nationals in the year 2007. The average income of co-nationals, another common measure of ethnic capital, cannot be used in this research due to potential collinearity with the dependent variable welfare receipt. Considering that for half of the migrant population information on their education level is missing, we checked whether such missingness is concentrated among migrants from specific regional origin and found the proportion of migrants with missing education level is quite evenly distributed across regional origin (below 5% difference). Ethnic concentration is measured as the share of co-nationals in the municipality in 2007. We have tried to vary its definition by measuring it through the log-transformed number of co-nationals at the municipality level, and also at higher geographical units, namely at regional and provincial levels. Our decision is based on three considerations: (i) the literature generally agrees that the lower the geographical unit the better the measurement; (ii) municipality is an optimal level in our research context since neighborhood and street levels are too small to capture the local economic opportunities offered by co-ethnic contact, such as co-ethnic employment

in ethnic businesses, whereas regional and provincial levels are too large; and (iii) pseudo R-square of the model using the share of co-nationals at the municipality level is higher.

The education level variable comprises four categories: low, middle, high and unknown. The 'unknown' category accounts for about 50% of the observations for the migrant population, due to the collection method for such information. While measurement error is known to exist in this variable and the use of it is said to be potentially problematic for migrant populations, we have identified the limited extent of such problems in two steps. Firstly, the correlation of such missingness with characteristics such as education level, ethnic origin and specific age groups, is low. Secondly, after applying weighting, there are only minor changes in the estimates.

3.3 Identification Problem and Other Controls

The well-known identification problem in the literature of immigrant assimilation lies in identifying the effects of aging, the cohort and the period from the effect of assimilation.

Several ways have been proposed to identify the model. The most straightforward solution is to assume either equal period effects for immigrants and natives (Borjas, 1985) or equal cohort effects. However, empirical findings have consistently contradicted these assumptions by showing that, globally as well as in the Dutch case, economic downturn has had differential impacts on immigrants and natives (CBS, 2009), and immigrants from different entry cohorts display differential degrees of welfare participation (Zorlu, 2013).

Although it has long been established that the economic assimilation potentials differ greatly by immigrant cohorts (Borjas, 1985, 1995), as again pointed out by Borjas (2013), the source of cohort effect can be multiple, including changing origin composition of immigrants cohorts, changing cohort qualities, changing macro-economic conditions, differential distribution of geographical settlement, changing amounts of investment in destination-specific human capital, and changing destination country immigration policies. Most of these hypotheses were based on the Mincer-Becker human capital framework. For example, many studies suggest that cohort effect mainly stems from differences in cohort composition and characteristics (Blume & Verner, 2007; Borjas, 1985), whereas Borjas (2013) identifies the growing size of certain national origin groups as one factor associated with the declining rate in English language skill acquisition and

economic assimilation among recent cohorts in the United States. In the Dutch case, the likelihood of welfare utilization is found to be the highest for the 1990-1995 cohort, and much lower for more recent as well as older cohorts (Zorlu, 2013).

The relevance of period effect has been highlighted as empirical evidence shows that welfare participation is highly sensitive to changes at the macro level. The entry gap and pace of economic assimilation are affected by arrival year effect (Clark & Lindley, 2006), and immigrants are more negatively affected by macroeconomic conditions than natives (Crossley, McDonald & Worswick, 2001). Period effect can also stem from introduction of policy changes.

Another concern is settler bias. Selectivity might be present in the choice of return migration or remigration (Beenstock et al., 2010; Duleep & Dowhan, 2002). Estimates of the economic integration of immigrants would be upwardly biased if the least successful have a greater propensity to remigrate, or downwardly biased if the most successful are more likely to leave (Chiswick, 2000). For example, Ekhaugen (2005) finds remigration to concentrate among western immigrants who are less likely to use welfare. Many studies have also found that certain groups of refugees tend to move to other countries where they have family or clan ties after obtaining citizenship, such as the high number of onward mobility to the U.K. among Somalis from the Netherlands (Heelsum, 2011).

In line with common practice of more recent research, we group the entry cohorts into five-year intervals and include regional unemployment rate suggested by Barth et al. (2004) in the model. Although the wage-curve approach was initially proposed to relax the equal period effect assumption among immigrants and natives, it helps account for the differential sensitivities to local labour market conditions even among immigrants from different regions and countries (Akay, 2008). By doing so, the provincial unemployment rate accounts for differential welfare use propensities among immigrants through the direct effect on employment prospects and through the indirect effect on acquisition of destination-specific human capital via on-the-job learning. This has been supported by empirical evidence for the Dutch case: after 10 years of residence, the chance of receiving social assistance is lower among asylum migrants who have been placed under the settlement policy in regions with better job prospects; sensitivities to local labour market conditions among asylum migrants also differ by individual characteristics such as age, gender, country of origin, and education level (CPB, 2018). In addition to the provincial unemployment rate, different sources of local variations will

be controlled for through the province variable due to data limitations. We also control for age at migration instead of age. Settler bias is accounted for through inclusion of a remigration dummy. To identify migrants who remigrate, including both onward international migration and return migration, an assumption is made that attrition from the sample before the last observation year 2015 is due to remigration if it is not because the individual has passed the maximum sample age of 60 or died. 109,928 individuals (24.25%) have remigrated in our sample.

3.4 Model specification

In spite of the fact that an overwhelming proportion of welfare utilization and assimilation studies work with a static model, Akay (2015) proposes the use of a dynamic employment assimilation model to avoid biased estimates of assimilation profiles through taking into account the dynamic nature of such processes. Built upon this basis, this research employs a dynamic correlated random effects (CRE) probit model to study immigrant welfare assimilation.

The basic dynamic random effects model is demonstrated in equation 1 below. Y refers to the latent probability of welfare receipt. Y_{it-1} is the lagged status of welfare receipt, and γ can be interpreted as the degree of structural state dependence (Heckman, 1981). Only one lag of the dependent variable is and can be used when controlling for initial conditions (Wooldridge, 2005, p. 42). X is a vector of covariates. μ captures the individual-specific unobserved heterogeneity. ε is the error term. These two error terms are assumed to be uncorrelated and normally distributed with mean zero. The observation period is 2008-2015, with 2007 as the initial period. Two problems are to be solved: the endogenous covariates problem and initial conditions problem. The endogenous covariates problem arises if there is correlation between the unobserved heterogeneity and the covariates. The initial condition problem occurs if the unobserved heterogeneity is correlated with Y_{i0} and thus with lagged status, unless the initial condition is exogenous. For example, if the first wave of observation for all individuals starts at the age of 18, the first year eligible for welfare, there is no initial conditions problem. Otherwise, we need to use specific estimators that deal with this problem.

$$Y_{it} = \alpha + Y_{it-1}\gamma + X_{it}\beta + \mu_i + \varepsilon_{it}\,, \qquad t = 1, \dots, 8 \qquad (1)$$

In the econometrics literature, three common approaches have prevailed in the setting of dynamic binary choice models – Heckman's reduced-form approximation (1981), Wooldridge's conditional maximum likelihood estimator (2005), and Orme's approach (2001). Instead of modelling the initial state as in Heckman's and Orme's methods, Wooldridge proposes to model $\mathrm{D}(Y_1 + \cdots + Y_T \mid X_t, Y_0)$ by specifying $\mathrm{D}(\mu \mid Y_0, \bar{X})$. Wooldridge's approach approximates the specification of the Chamberlain-Mudlank's correlated random effects (CRE), which deals with the endogenous covariates problem by relaxing the strict exogeneity assumption of random effects between μ and X through $\bar{X}$. To do so, the values of time-varying covariates across the observation period are used – either by including the time-averaged values (often used to save on degrees of freedom), or the lags and leads of time-varying covariates (Wooldridge, 2007). We include the time-averaged values of time-varying covariates as demonstrated in equation 2 below.

$$Y_{it} = \alpha + Y_{it-1}\gamma + X_{it}\beta + Y_{i0}\theta + \bar{X}_i\tau + \mu_i + \varepsilon_{it}\,, \qquad t = 1, \ldots, 8 \qquad (2)$$

Most welfare and economic assimilation studies have applied Wooldridge's approach partly due to its implementarity given existing programs in statistical softwares. Cappellari & Jenkins (2008) demonstrate that similar results are provided by the three estimators on both balanced and unbalanced panels that are sufficiently long. Arulampalam & Stewart (2009) also find that, for T>3, similar insubstantial bias is produced across Wooldridge's and Heckman's approaches. Akay (2009) even suggests that, for panels with longer durations (5-8 periods), the Wooldridge method outperforms the Heckman's approach. Wooldridge's approach was developed to be implemented on balanced panels, but it may be applied to unbalanced panels if attrition is random (Cappallari & Jenkins, 2008). Its application in unbalanced panels by Cappellari & Jenkins (2008) and Akay (2009) did not suggest presence of a substantial bias.

4. Results

4.1 Life-cycle Welfare Assimilation Profiles

Based on results from dynamic CRE probit regressions estimated separately for first-generation immigrants from each area of origin (which will be described in detail in Section 4.2 below), we first predict the average probability of welfare utilization over the working-age life-course for immigrants by their areas of origin, entry category, education

level and gender. After estimating a similar dynamic CRE probit regression for the native sample excluding all migration characteristics for the native sample (full regression output in Appendix 1), the same predictions have been estimated for two reference groups from the native sample: average Dutch natives who represent the mainstream, and Dutch natives with low education level who represent the economically marginalized segment of the Dutch society. An assumption is made that everyone enters the labour market at 18. For first-generation immigrants, age at migration is thereby assumed to be 18, which corresponds to YSM=0, so that the life-course trends between immigrants and natives of the same age are directly comparable. Given that the maximum YSM observed is 21+, the corresponding maximum age range observed is 39-60. Other characteristics take the values as observed for each individual.

Dutch natives with low education level at ages 39-60 serve as the benchmark, and statistical significance test is performed for determining which of the assimilation paths migrants are predicted to undergo. Specifically, we compare the ultimate probability of each migrant subgroup at YSM=21+ to that of Dutch natives with low education level at age=39-60 (0.120). Divergence from average natives and assimilation into the working class is deemed to occur if the null hypothesis and the lower-tailed alternative hypothesis are rejected by t-test, and either the two-tailed alternative hypothesis or the upper-tailed alternative hypothesis is not rejected by t-test (i.e. the ultimate probability is either not significantly different from 0.120 or is significantly higher than 0.120). Convergence to average natives and thus assimilation into the middle class is achieved if t-test shows that the ultimate probability is significantly lower than 0.120.

Table 3 summarizes the following results for first-generation immigrants by their area of origin, entry category, education level and gender: (i) predicted probability of welfare utilization at YSM=21+, (ii) corresponding assimilation outcome, (iii) intragenerational mobility pattern, and (iv) whether parity with average natives is reached. The life-cycle welfare assimilation trajectories of male immigrants by their area of origin, entry category and education level are shown in Graphs 1-26 in comparison with predicted welfare receipt probabilities for average Dutch natives and Dutch natives with low education level. The 95% confidence interval is shown in gray.

Concerning the assimilation outcomes, the results suggest that, after more than 20 years of residence, assimilation into the mainstream is not a common path for all, and the risk of marginalization is present for the majority of first-generation immigrants without

higher education. A closer look at those with predicted probability levels above that for Dutch natives with low education reveals an even more concerning picture, as some have more than double. This might indicate not merely a risk of assimilation into the working class, but essentially, no assimilation. Observing this pattern led us to draw an additional threshold to identify whether some groups do not even come close to assimilating into the working class. No assimilation is deemed to occur if t-test shows that the ultimate probability at YSM=21+ is either not significantly different from or is significantly higher than 0.240, which doubles the predicted probability for Dutch natives with low education level at age=39+.

Education & Labour

In relative terms, education migrants and labour migrants are predicted to have the most favourable assimilation outcomes, as the majority are predicted to assimilate into the mainstream. Furthermore, most of them with high and unknown education levels as well as EU migrants, who, regardless of their education levels, are predicted to achieve comparable levels or even outperform average Dutch natives in terms of welfare utilization propensity after more than 20 years of residence. Meanwhile, the risk of marginalization exists for (i) most of those with low education level, and (ii) those with middle education level from the MENA region and Sub-Saharan Africa. The risk of no assimilation is present for low-educated education migrants from the MENA region, and low-educated female education migrants from Sub-Saharan Africa and Suriname & Caribbean.

Family migrants do not perform as well as the above groups of economic migrants. Almost all family migrants with low-to-middle education levels are at risk of segregation from the mainstream, except those from EU countries and those with middle education level from Asia and Americas & Oceania (men only). Disadvantages are concentrated among family migrants from the MENA region and Sub-Saharan Africa; hence higher education as the route to mainstream assimilation no longer applies to those from these regions, and such migrants with low education level are at risk of no assimilation. Only highly educated family migrants from EU countries as well as family migrants with unknown education level from Asia and Americas & Oceania are predicted to reach parity with average Dutch natives after more than 20 years of residence.

Most asylum migrants predicted to remain on the margins, despite notable upward mobility achieved. Exceptions are those with high education level from Suriname & Caribbean and those with high or unknown education level from Asia. The majority of them with low education level are at risk of no assimilation. In the case of asylum migrants from the MENA region, Sub-Saharan Africa and other Europe, who comprise over 80% of asylum migrants in the sample, higher education fails to serve as the ladder to mainstream assimilation as it does for all other types of migrants, though it helps alleviate their levels of disadvantage. None of the asylum migrants are foreseen to reach parity with average Dutch natives.

In sum, an education gradient manifests in the welfare assimilation patterns of all types of first-generation immigrants. Higher education opens door for mainstream assimilation except for asylum migrants with the following backgrounds: the MENA region, Sub-Saharan Africa and other Europe. In relative terms, economic/skilled migrants, including education and to a lesser extent labour migrants, are more advantaged than non-economic migrants. Among non-economic migrants, family migrants are better off than refugees. Such patterns remain consistent when only social assistance receipt is considered, except that even highly educated education migrants and labour migrants from the MENA region would in that case be predicted to be at risk of marginalization.

Gender & Aspiration to Integrate

The gender perspective also sheds lights on its interaction with human capital. In general, female migrants are in relative terms worse-off than their male counterparts. Such gender difference in welfare utilization propensity is much more pronounced among non-economic migrants (family migrants and asylum migrants) than economic migrants. However, almost all highly educated female migrants are better-off than their male counterparts, regardless of their entry categories and regional origin.

An additional simulation exercise is performed to see whether the disadvantaged position of migrants could be compensated by their aspiration to integrate, indicated by the decision to naturalize (see Appendix 2). The results show that the "citizenship premium" mainly applies to uplifting disadvantaged migrants from Asia and Americas & Oceania as well as economic migrants to mainstream assimilation, but it changes little such prospect for non-economic migrants.

Intragenerational Mobility

Lastly, to identify the patterns of intragenerational mobility, we compare the initial and ultimate welfare receipt probabilities predicted for each migrant group in relative terms with Dutch natives with low education level of the same age. Three types of relative mobility patterns are discerned: upward mobility, stagnation, and downward mobility. Upward or downward mobility occurs as vertical movement across segments takes place, and stagnation occurs if one remains in the same segment. The results show that, although the initial gap from Dutch natives is sizeable for most first-generation immigrants, upward movement from no assimilation or working-class assimilation to mainstream assimilation is the dominant trend that occurs through their working-age life course. The diversity in mobility patterns even for immigrants with the same predicted assimilation destination suggests the importance of focusing not only on the ultimate assimilation outcome, but its comparison with their initial conditions. Substantial progress has been made for many, even among those who are predicted to remain on the margins. Such results also align with our initial thought that the terms 'downward assimilation' and 'upward assimilation' should be handled with caution in that mobility is relative while assimilation outcome is absolute.

4.2 Determinants

The full regression results of dynamic CRE probit model mentioned in Section 3.4 for all first-generation immigrants and by their areas of origin for the dependent variable welfare receipt probability can be found in Appendix 3. Estimation results for social assistance receipt probability, which show to be consistent with results for the composite welfare measure, can be seen in Appendix 4.

Table 4 below shows the average marginal effects of key determinants. After controlling for YSM, education level and other characteristics, each category of the regional origin and entry category variables remain strongly correlated with the probability of welfare utilization. Compared with EU migrants, migrants from all other areas are more like to receive welfare. The ethnic penalty effect appears the strongest for migrants from the MENA region and Sub-Saharan Africa, followed by migrants from other Europe and Suriname & Caribbean. The citizenship premium, the proxy for aspiration to integrate,

Table 3: Predicted welfare assimilation path by regional origin, entry category, education level and gender (Assuming age at migration: 18)

=		Labour migrant				Education migrant				Family migrant				Asylum migrant			
		Low	Mid	High	Unknown	Low	Mid	High	Unknown	Low	Mid	High	Unknown	Low	Mid	High	Unknown
EU	M	0.09 (+++)	0.06 (+++)	**0.03 (+++)**	**0.01 (=)**	**0.05 (+++)**	**0.03 (+++)**	**0.01 (++)**	**0.00 (++)**	0.09 (+++)	0.05 (+++)	**0.03 (+++)**	0.01 (+++)				
	F	0.12 (+)	0.07 (+++)	**0.04 (+++)**	**0.01 (=)**	0.07 (+++)	**0.04 (+++)**	**0.02 (+++)**	**0.00 (+++)**	0.11 (+++)	0.06 (+++)	**0.03 (+++)**	0.01 (+++)				
Other Europe	M	0.09 (+++)	0.05 (+++)	**0.03 (+++)**	**0.01 (=)**	0.14 (+)	0.08 (+++)	0.06 (++)	0.06 (++)	0.19 (+)	0.12 (+)	0.09 (+++)	0.08 (+++)	0.25 (=)	0.18 (+)	0.14 (+)	0.13 (+)
	F	0.11 (+++)	0.06 (+++)	**0.03 (+++)**	**0.01 (=)**	0.18 (+)	0.11 (+++)	0.07 (+++)	0.08 (+++)	0.24 (+)	0.15 (+)	0.10 (+++)	0.12 (+)	0.30 (=)	0.20 (+)	0.15 (+)	0.16 (+)
MENA	M	0.25 (=)	0.13 (+)	0.11 (+++)	0.14 (+)	0.24 (=)	0.13 (+)	0.10 (+++)	0.13 (+)	0.30 (=)	0.17 (+)	0.14 (+)	0.17 (+)	0.36 (=)	0.21 (+)	0.18 (+)	0.21 (+)
	F	0.30 (=)	0.14 (+)	0.11 (+++)	0.17 (+)	0.29 (=)	0.13 (+)	0.11 (+++)	0.17 (+)	0.35 (=)	0.18 (+)	0.15 (+)	0.21 (+)	0.41 (=)	0.22 (+)	0.19 (+)	0.26 (=)
Sub-Saharan Africa	M	0.22 (+)	0.10 (+)	0.07 (+++)	0.13 (+)	0.22 (+)	0.10 (+++)	0.07 (+++)	0.12 (+)	0.34 (=)	0.19 (+)	0.14 (+)	0.21 (+)	0.43 (=)	0.26 (=)	0.20 (+)	0.29 (=)
	F	0.33 (=)	0.15 (+)	0.08 (+++)	0.19 (+)	0.32 (=)	0.14 (+)	0.08 (+++)	0.18 (+)	0.45 (=)	0.24 (+)	0.15 (+)	0.28 (=)	0.54 (=)	0.32 (=)	0.21 (+)	0.35 (=)
Asia	M	0.17 (+)	0.09 (+++)	**0.05 (++)**	**0.04 (++)**	0.16 (+)	0.08 (+++)	**0.04 (++)**	**0.03 (++)**	0.19 (+)	0.10 (+++)	0.06 (++)	**0.04 (++)**	0.24 (+)	0.14 (+)	0.09 (+++)	0.06 (+++)
	F	0.18 (+)	0.09 (+++)	**0.05 (++)**	**0.04 (++)**	0.16 (+)	0.08 (+++)	**0.04 (++)**	**0.04 (++)**	0.19 (+)	0.10 (+++)	0.06 (+++)	**0.05 (++)**	0.24 (=)	0.14 (+)	0.09 (+++)	0.07 (+++)
Americas & Oceania	M	0.15 (+)	0.09 (++)	0.06 (++)	**0.02 (=)**	0.10 (+++)	0.06 (++)	**0.03 (=)**	**0.01 (=)**	0.16 (+)	0.10 (+++)	0.06 (++)	**0.02 (=)**				
	F	0.19 (+)	0.12 (+++)	0.06 (++)	**0.03 (=)**	0.14 (+)	0.08 (++)	**0.04 (=)**	**0.02 (=)**	0.21 (+)	0.13 (+)	0.07 (++)	**0.04 (=)**				
Suriname & Caribbean	M	0.21 (+)	0.10 (+++)	**0.04 (++)**	0.07 (+++)	0.21 (+)	0.10 (+++)	**0.04 (++)**	0.07 (+++)	0.27 (+)	0.14 (+)	0.06 (+++)	0.10 (+++)	0.35 (+)	0.21 (+)	0.11 (+++)	0.14 (+)
	F	0.26 (=)	0.12 (+++)	**0.04 (++)**	0.07 (+++)	0.25 (=)	0.11 (+++)	**0.04 (++)**	0.07 (+++)	0.32 (+)	0.16 (+)	0.06 (+++)	0.10 (+++)	0.41 (+)	0.23 (+)	0.11 (+++)	0.15 (+)

Destination of assimilation (in colour)
Assimilation to the middle class: Average natives (pr<0.120)
Assimilation to the working class: Natives with low education level (pr>0.120)
No assimilation: Above predicted probability for natives with low education level (pr>0.240)

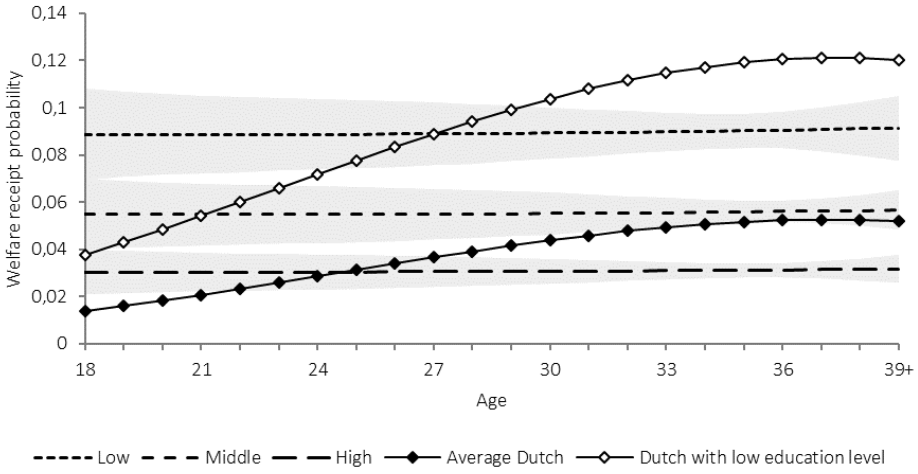
Parity with average natives (in bold): pr<0.052

Relative mobility (in bracket)
Upward mobility:
- From no assimilation to middle class: +++
- From working class to middle class ++
- From no assimilation to working class: +

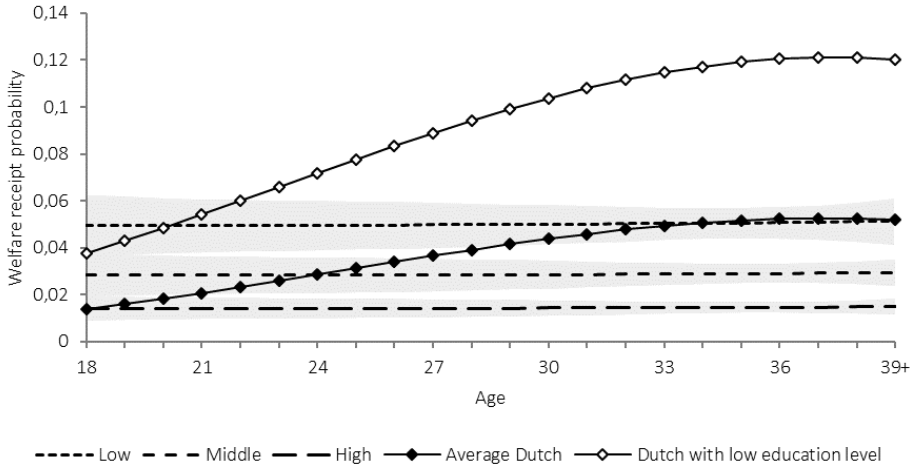
Stagnation: =
Downward mobility: —

Note: Average probabilities of welfare utilization assuming age at migration at 18 are reported up to 2 decimal points. All predicted probabilities are statistically significant at 1% level. T-tests have been performed to compare each predicted probability against specific thresholds mentioned in the legend.

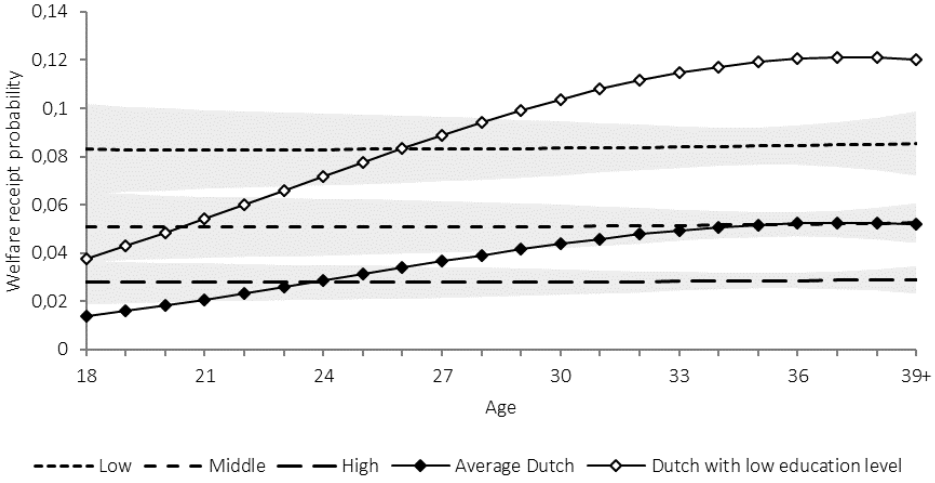
Graph 1: Assimilation profile for male EU labour migrants by education level
(Age at migration: 18)



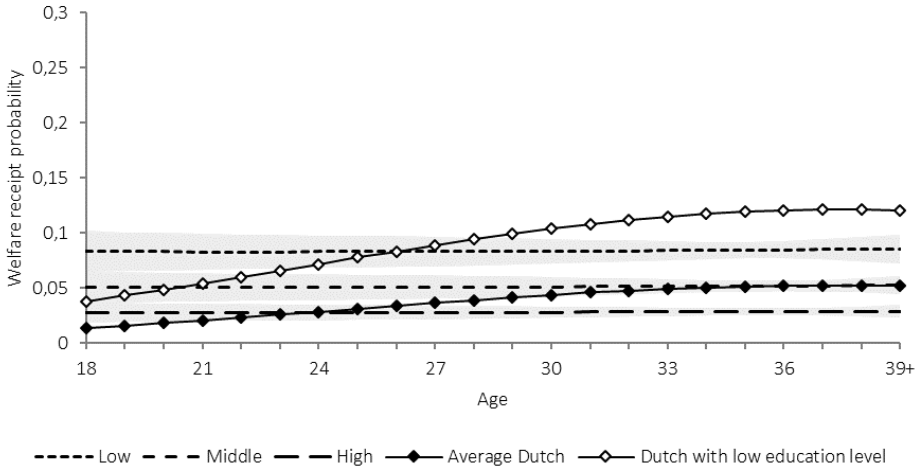
Graph 2: Assimilation profile for male EU education migrants by education level
(Age at migration: 18)



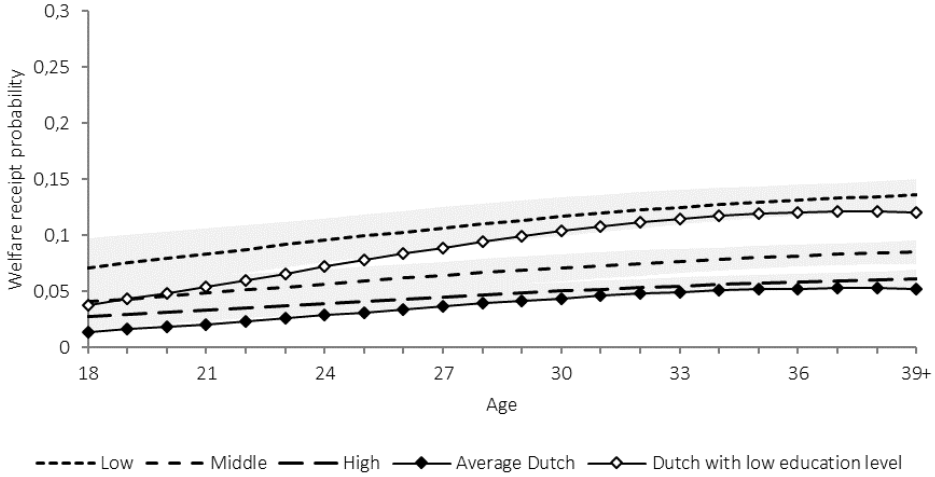
Graph 3: Assimilation profile for male EU family migrants by education level
(Age at migration: 18)



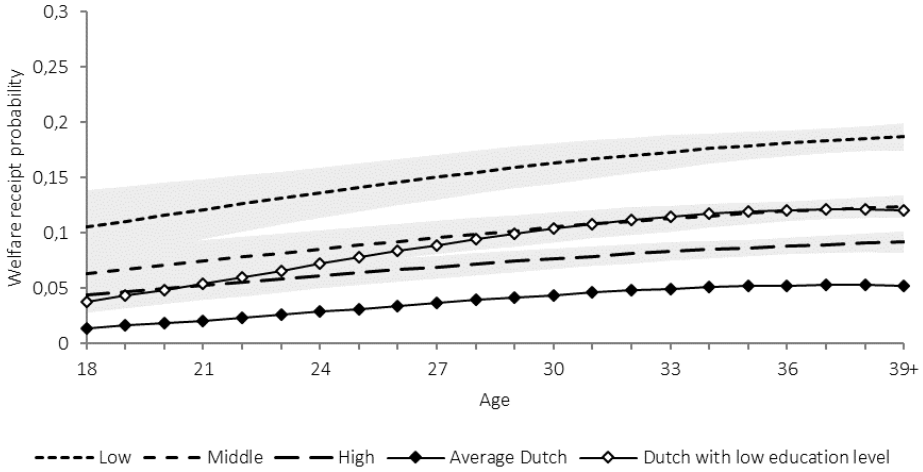
Graph 4: Assimilation profile for male labour migrants from other Europe by education level (Age at migration: 18)



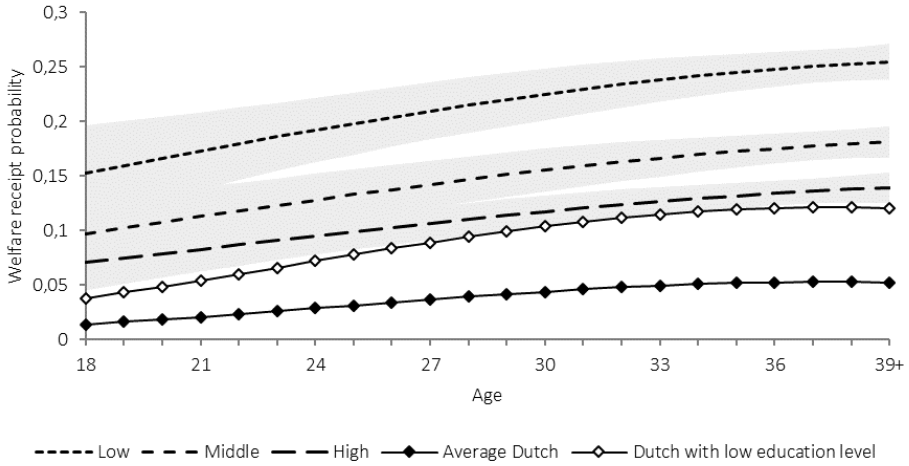
Graph 5: Assimilation profile for male education migrants from other Europe by education level (Age at migration: 18)



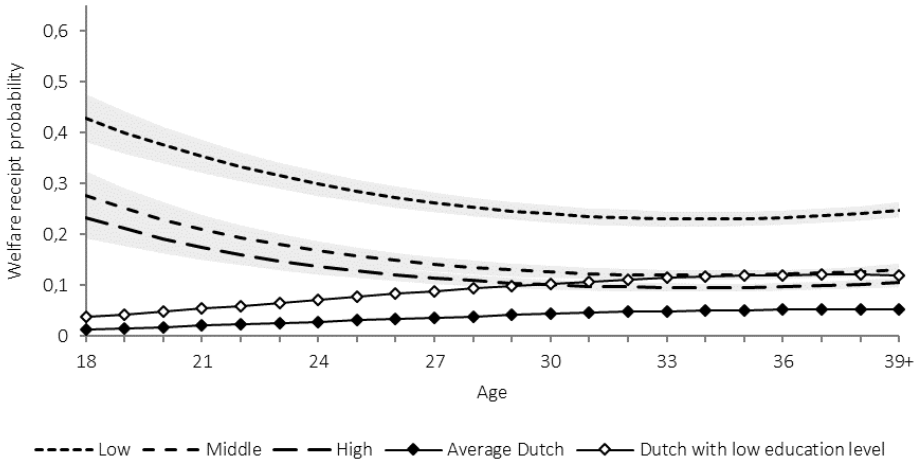
Graph 6: Assimilation profile for male family migrants from other Europe by education level (Age at migration: 18)



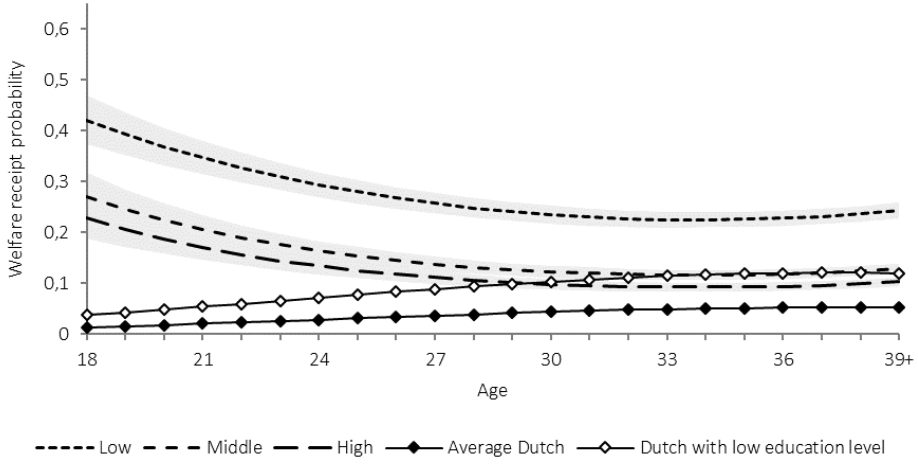
Graph 7: Assimilation profile for male asylum migrants from other Europe by education level (Age at migration: 18)



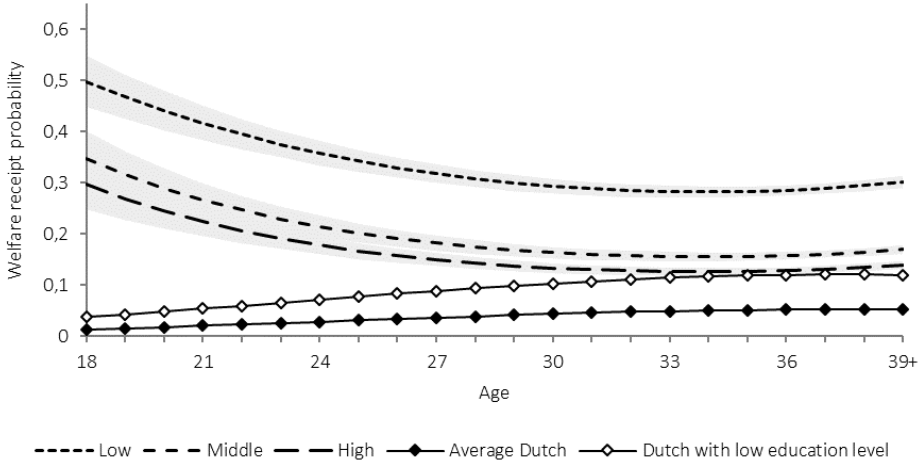
Graph 8: Assimilation profile for male labour migrants from the MENA region by education level (Age at migration: 18)



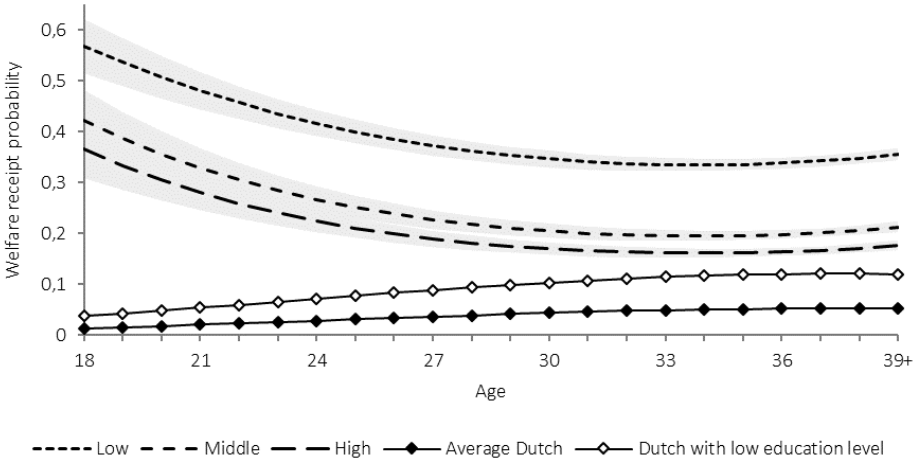
Graph 9: Assimilation profile for male education migrants from MENA region by education level (Age at migration: 18)



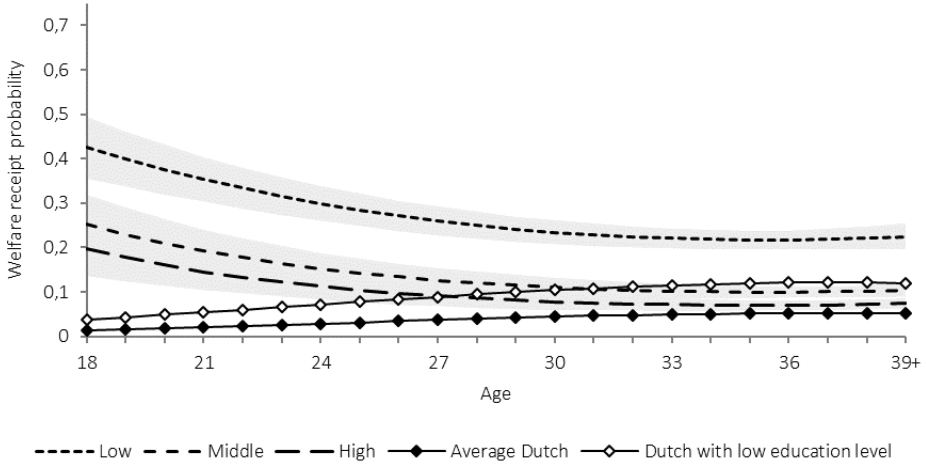
Graph 10: Assimilation profile for male family migrants from the MENA region by education level (Age at migration: 18)



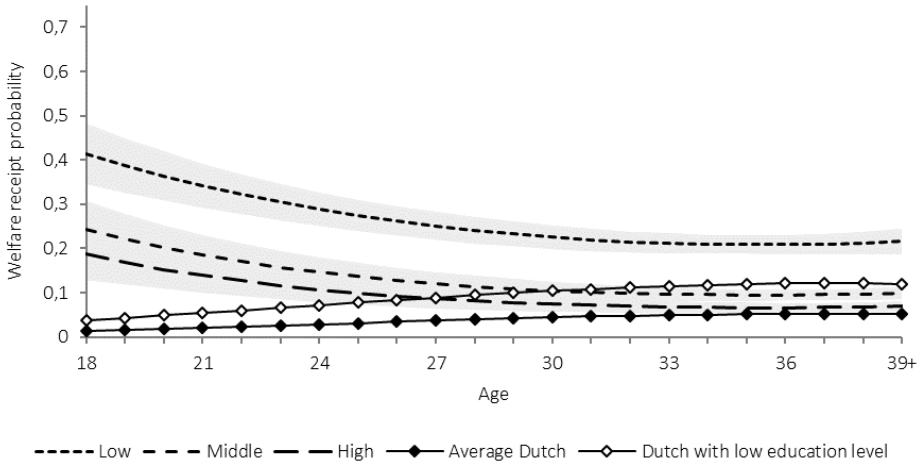
Graph 11: Assimilation profile for male asylum migrants from MENA region by education level (Age at migration: 18)



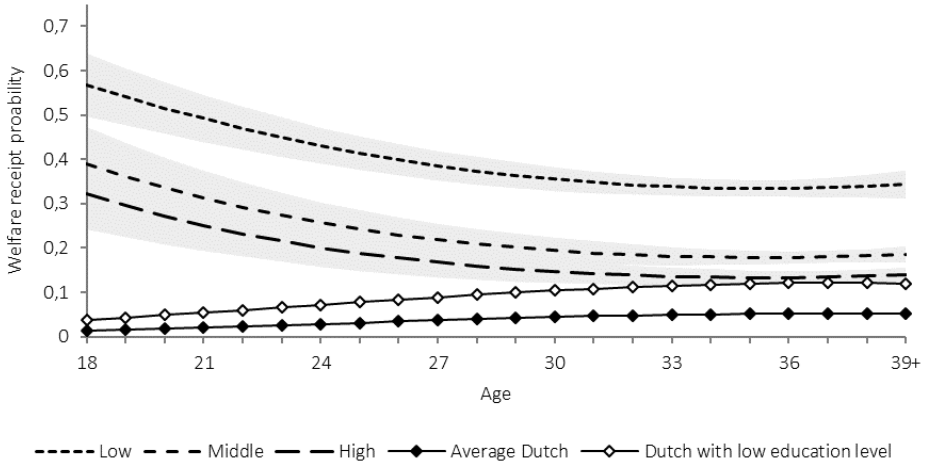
Graph 12: Assimilation profile for male labour migrants from Sub-Saharan Africa by education level (Age at migration: 18)



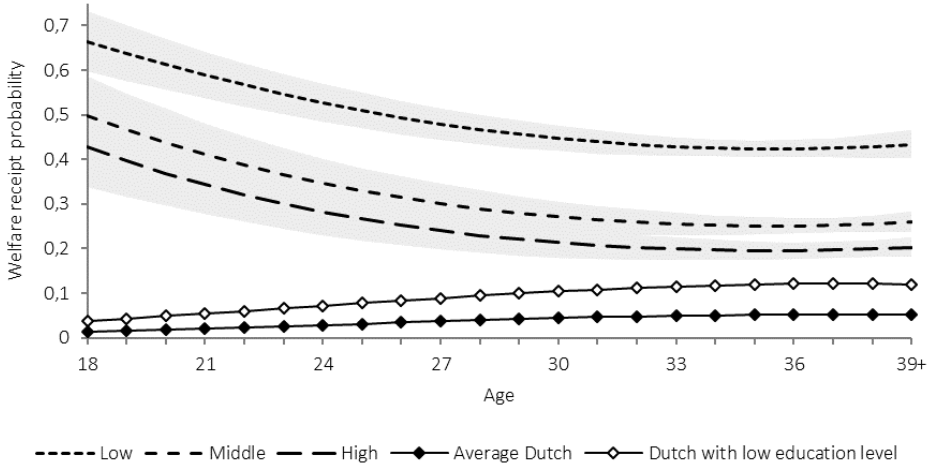
Graph 13: Assimilation profile for male education migrants from Sub-Saharan Africa by education level (Age at migration: 18)



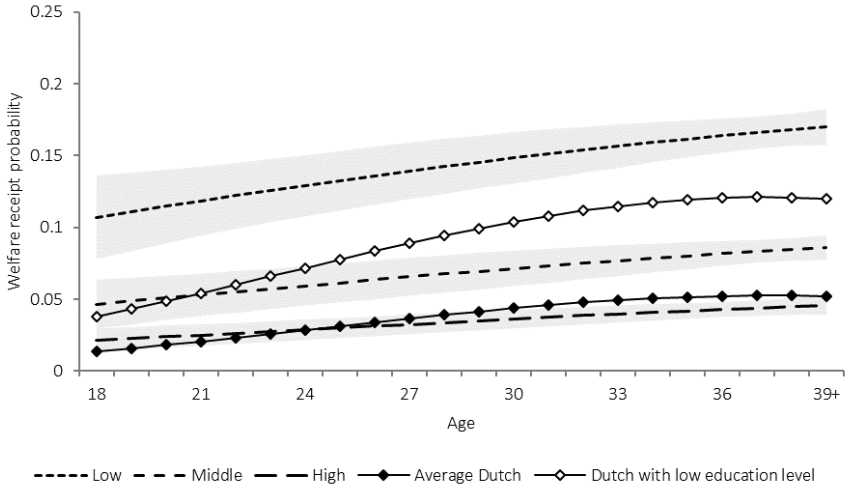
Graph 14: Assimilation profile for male family migrants from Sub-Saharan Africa by education level (Age at migration: 18)



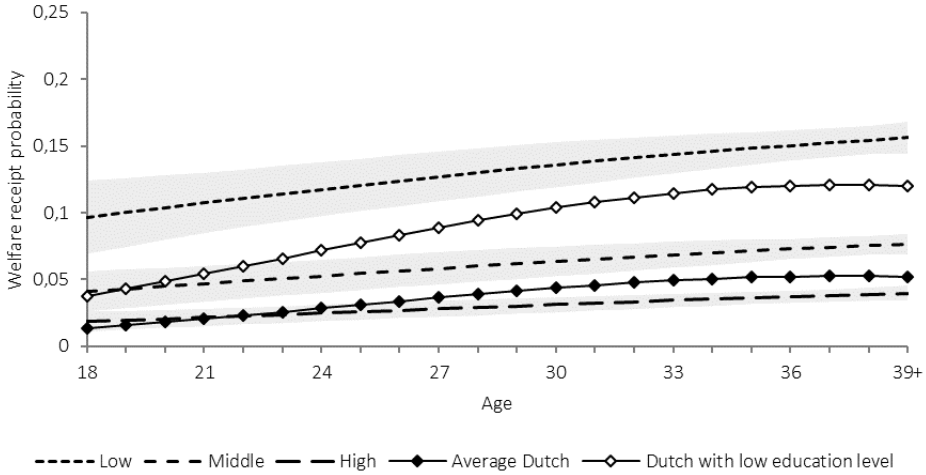
Graph 15: Assimilation profile for male asylum migrants from Sub-Saharan Africa by education level (Age at migration: 18)



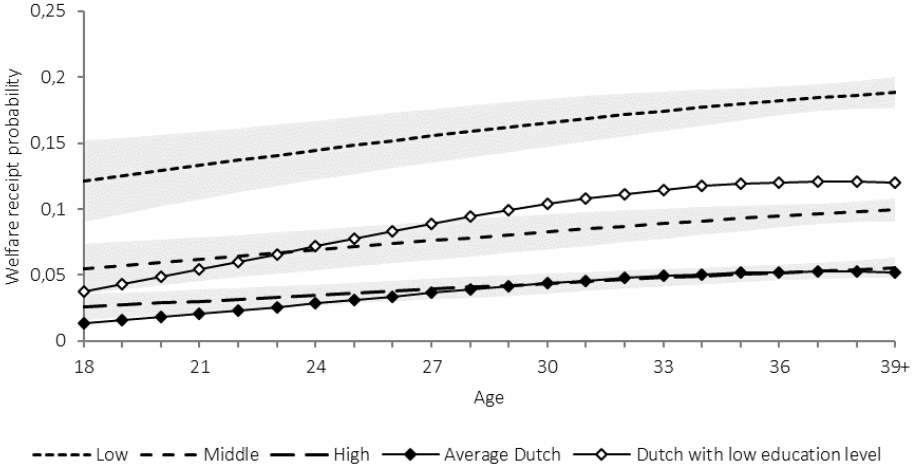
Graph 16: Assimilation profile for male labour migrants from Asia by education level
(Age at migration: 18)



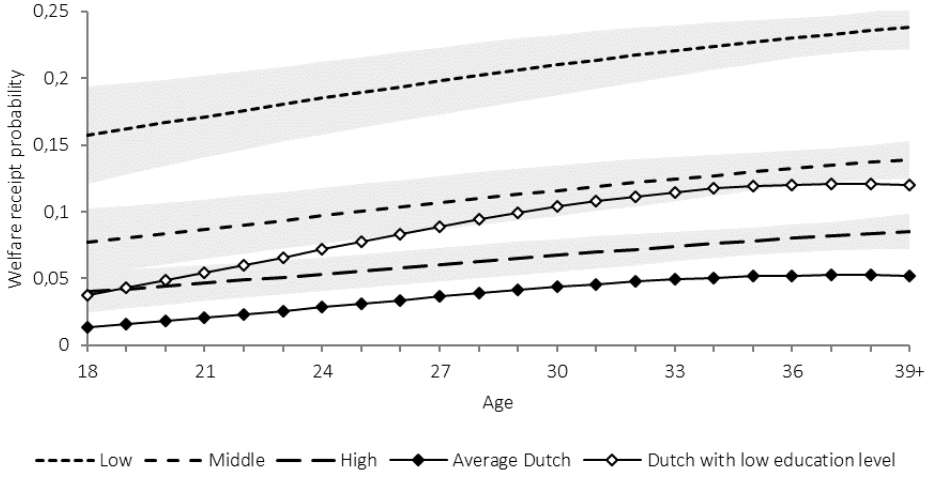
Graph 17: Assimilation profile for male education migrants from Asia by education level
(Age at migration: 18)



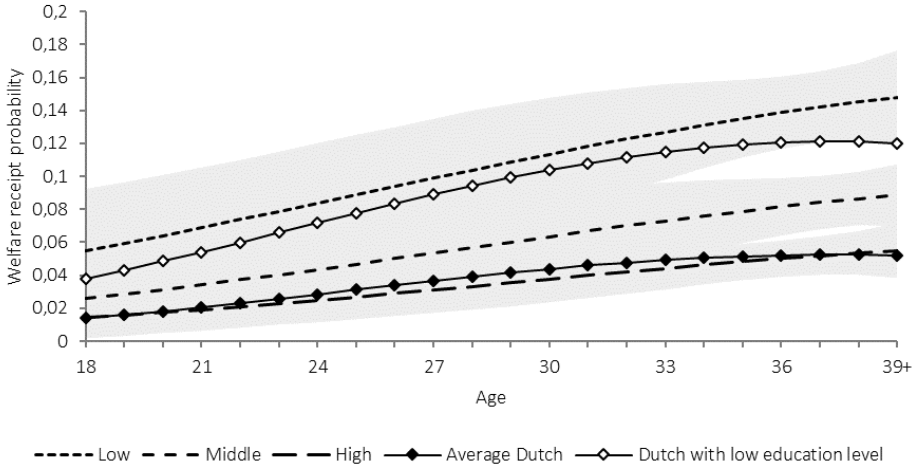
Graph 18: A Assimilation profile for male family migrants from Asia by education level
(Age at migration: 18)



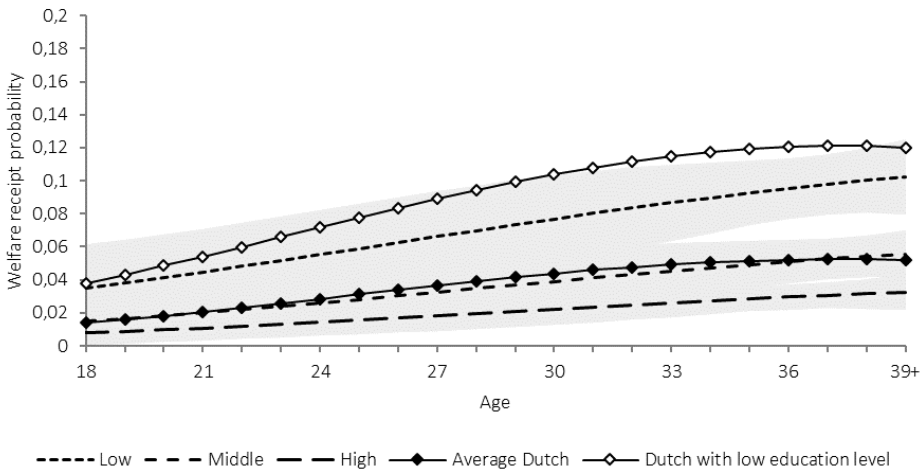
Graph 19: Assimilation profile for male asylum migrants from Asia by education level
(Age at migration: 18)



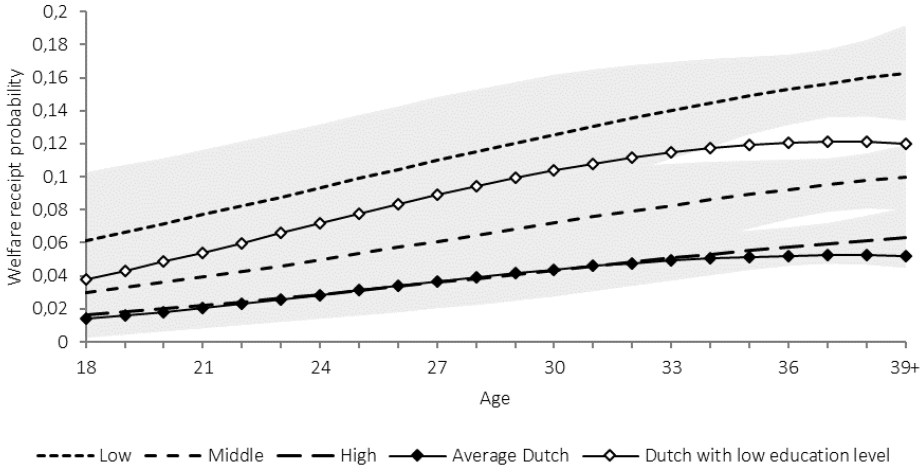
Graph 20: Assimilation profile for male labour migrants from Americas & Oceania by education level (Age at migration: 18)



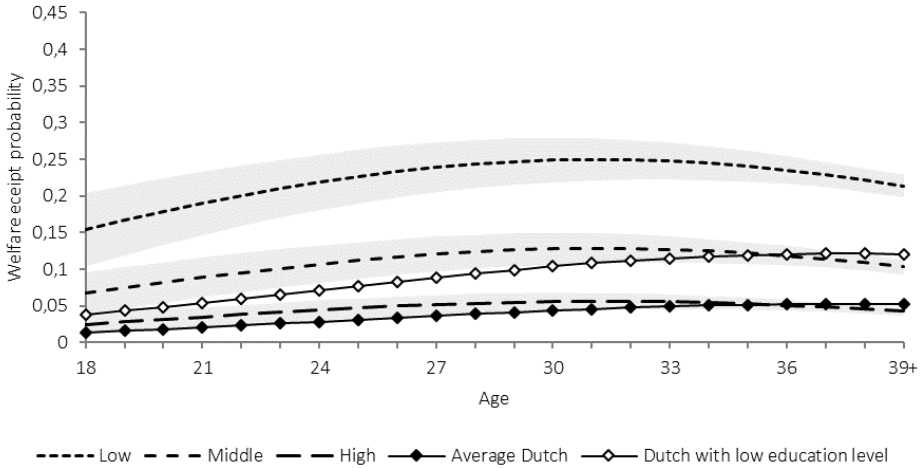
Graph 21: Assimilation profile for male education migrants from Americas & Oceania by education level (Age at migration: 18)



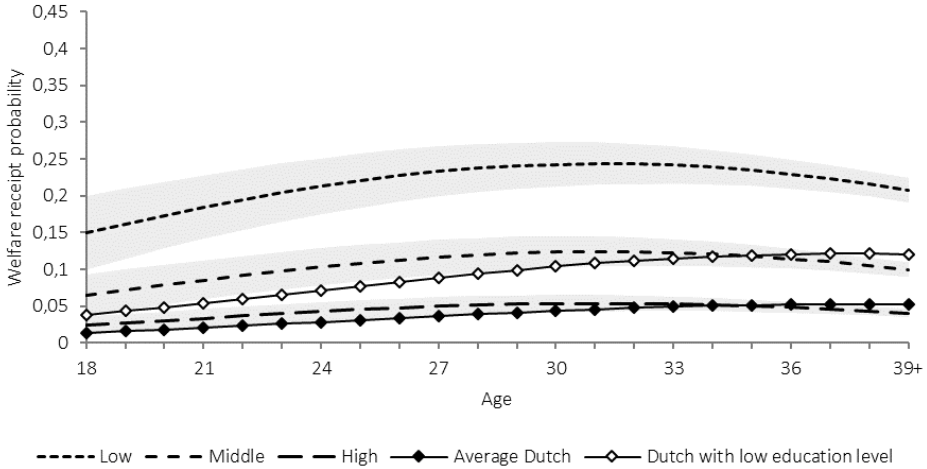
Graph 22: Assimilation profile for male family migrants from Americas & Oceania by education level (Age at migration: 18)



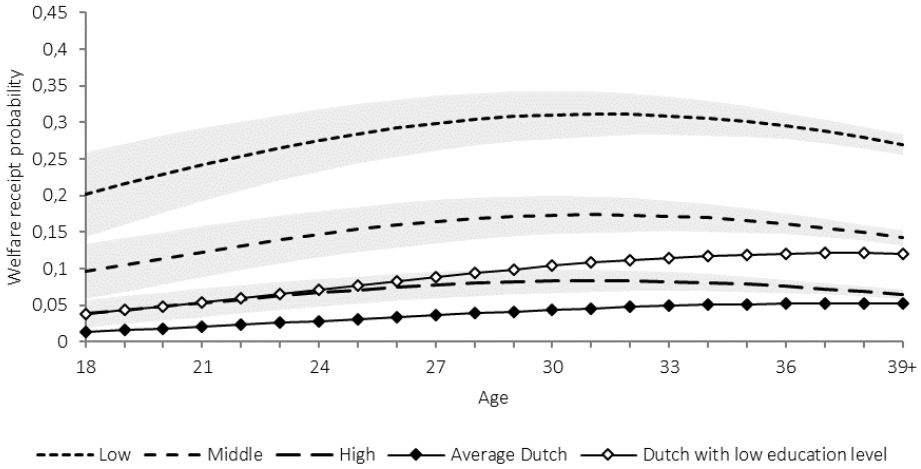
Graph 23: Assimilation profile for male labour migrants from Suriname & Caribbean by education level (Age at migration: 18)



Graph 24: Assimilation profile for male education migrants from Suriname & Caribbean by education level (Age at migration: 18)



Graph 25: Assimilation profile for male family migrants from Suriname & Caribbean by education level (Age at migration: 18)



Graph 26: Assimilation profile for male asylum migrants from Suriname & Caribbean by education level (Age at migration: 18)

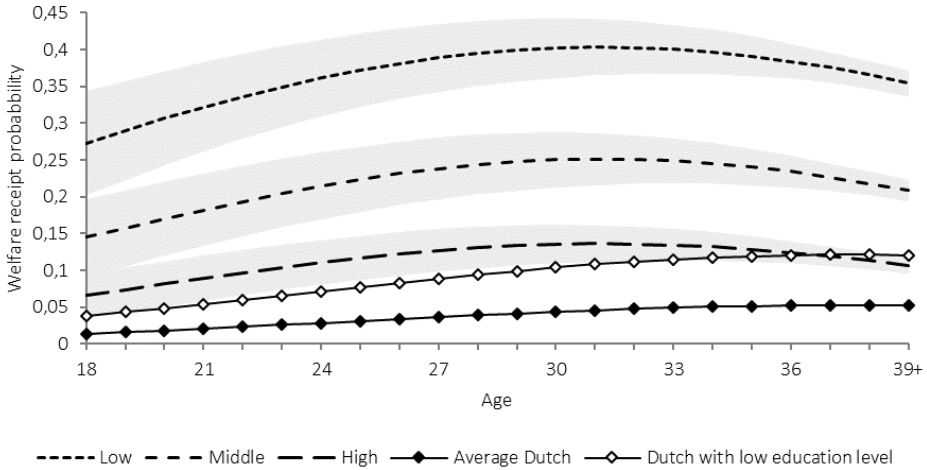


Table 4: Determinants of welfare receipt probability (Average marginal effects)

Welfare receipt	All migrants	EU	Other Europe	MENA	Sub-Saharan Africa	Asia	Americas & Oceania	Suriname & Caribbean
Lagged status	0.450***	0.192***	0.490***	0.619***	0.418***	0.529***	0.257***	0.462***
	(0.003)	(0.006)	(0.007)	(0.005)	(0.007)	(0.010)	(0.015)	(0.006)
YSM	-0.003***	0.000	0.006**	-0.019***	-0.019***	0.003**	0.004*	0.011***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)
YSM-squared	0.000***	0.000	0.000	0.001***	0.001***	0.000	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Area of origin								
EU								
Other Europe	0.039***							
	(0.001)							
MENA	0.073***							
	(0.001)							
Sub-Saharan Africa	0.057***							
	(0.001)							
Asia	0.003***							
	(0.001)							
Americas & Oceania	0.000							
	(0.001)							
Suriname & Caribbean	0.029***							
	(0.001)							
Share of highly	-0.001***	0.001***	0.000	-0.001***	-0.007***	-0.003***	-0.001***	-0.001***
educated co-nationals	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share of co-nationals in	0.000***	-0.001***	0.003***	0.000	-0.053***	-0.004***	-0.033***	-0.001***
municipality	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.001)	(0.005)	(0.000)
Naturalization dummy	-0.017***	0.001	-0.025***	-0.030***	-0.044***	-0.004***	0.004**	-0.014***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)
Family migrant dummy	0.014***	-0.006***	0.007	0.012**	0.078***	0.003	0.017***	0.007
	(0.002)	(0.001)	(0.005)	(0.006)	(0.010)	(0.003)	(0.005)	(0.005)
Asylum	0.068***	0.011	0.061***	0.058***	0.160***	0.033***	0.062**	0.068***
migrant dummy	(0.002)	(0.007)	(0.008)	(0.007)	(0.012)	(0.005)	(0.027)	(0.007)
Labour migrant dummy	-0.008***	-0.003**	-0.011*	-0.031***	-0.023**	-0.007**	0.010*	-0.030***
	(0.002)	(0.001)	(0.006)	(0.006)	(0.011)	(0.003)	(0.005)	(0.005)
Education	-0.037***	-0.021***	-0.032***	-0.035***	-0.030***	-0.014***	-0.011**	-0.034***
migrant dummy	(0.002)	(0.001)	(0.006)	(0.007)	(0.011)	(0.003)	(0.004)	(0.005)
Age at migration	0.004***	0.002***	0.003***	0.005***	0.009***	0.002***	0.003***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Age at migration squared	0.000***	0.000***	0.000*	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Remigration dummy	-0.016***	-0.007***	-0.011***	-0.026***	-0.044***	-0.011***	-0.016***	-0.004*
	(0.001)	(0.001)	(0.003)	(0.003)	(0.005)	(0.002)	(0.003)	(0.003)
Cohort								
Before 1995								
1995-1999	-0.019***	0.000	-0.002	-0.004	-0.073***	-0.002	-0.009	-0.033***

	(0.002)	(0.003)	(0.007)	(0.007)	(0.013)	(0.004)	(0.007)	(0.006)
2000-2004	-0.021***	-0.005	0.004	-0.006	-0.097***	-0.003	0.001	-0.035***
	(0.004)	(0.006)	(0.010)	(0.009)	(0.019)	(0.007)	(0.012)	(0.009)
2005-2009	-0.034***	-0.011*	-0.004	-0.040***	-0.116***	-0.005	-0.002	-0.045***
	(0.004)	(0.007)	(0.012)	(0.010)	(0.022)	(0.008)	(0.014)	(0.011)
2010-2015	-0.045***	-0.015**	-0.002	-0.064***	-0.169***	-0.006	-0.001	-0.027*
	(0.004)	(0.007)	(0.014)	(0.012)	(0.022)	(0.009)	(0.016)	(0.016)
Education level								
Low								
Middle	-0.018***	-0.011***	-0.007***	-0.024***	-0.027***	-0.008***	-0.009***	-0.033***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)
High	-0.034***	-0.024***	-0.020***	-0.043***	-0.034***	-0.014***	-0.014***	-0.068***
	(0.001)	(0.002)	(0.003)	(0.002)	(0.006)	(0.002)	(0.003)	(0.002)
Unknown	-0.049***	-0.054***	-0.032***	-0.037***	-0.021***	-0.034***	-0.043***	-0.069***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.003)	(0.002)
Female	0.003***	0.002***	-0.001	0.012***	0.017***	0.002**	0.004**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)
Number of observations	2,026,536	426,362	318,004	393,983	139,329	230,319	79,185	439,354
Number of individuals	359,778	94,313	48,509	61,077	24,778	45,261	16,749	69,153

Note: The table reports average marginal effects of key variables of interest from the dynamic CRE probit models. Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

is also seen to be the largest among these groups, yet not large enough to offset the ethnic penalty effects. In general, naturalization is found to significantly reduce the welfare receipt probability of all non-western immigrants. This result surprisingly aligns with the finding of Bevelander & Pendakur (2009) that citizenship acquisition increases the probability of employment for non-EU and non-North American immigrants in Sweden. Compared with other types of migrants, entry as asylum migrants and family migrants as of 1995 are both correlated with higher probabilities of welfare receipt. Such positive correlations are statistically significant at the 1% level. The results suggest, in the first place, that YSM and human capital alone do not fully explain welfare utilization, and that the modes of incorporation in the receptive context matter, as suggested by the segmented assimilation theory.

Ethnic capital and ethnic concentration both demonstrate to be important controls, which generally significantly reduce the probability of welfare receipt for first-generation immigrants. This aligns with the hypothesis derived from the segmented assimilation theory that strong ethnic communities could help offset the negative effects of unfavourable modes of incorporation.

In addition to these structural factors, other life-course factors at the individual and household levels appear to be closely related to the propensity of welfare receipt. Coefficients of the lagged welfare receipt status, which indicates the effect of structural state dependence, are sizable and statistically significant at 1% level for immigrants from all areas of origin. Its effect is further reinforced when considering social assistance receipt alone. The so-called "welfare trap" occurs to have the strongest effect on those from Asia, the MENA region, other Europe and Suriname & Caribbean. Age at migration, arrival before 1995, and living in a single-person or single-parent household are positively correlated with welfare receipt propensity.

As for the issue of remigration, as mentioned in Section 3.3, the estimation results would be upwardly biased if the least successful in the labour market are the ones more likely to remigrate and vice versa. The results suggest that migrants who remigrate by the end of our observation period (2015) are uniformly less likely to receive welfare compared to those who did not. This finding is in accordance with general findings in the literature that migrants that remigrate are the ones less likely to use welfare. Characteristics of the movers are identified as follows: (i) shorter YSM (on average 13 versus 17 for stayers); (ii) mainly from recent entry cohorts (18% entering between 2006-2015 compared with much

lower rate of remigration at 6% among older cohorts); (iii) lower annual household income across all education levels and entry categories except for family migrants (37% versus 41% for stayers in the income distribution); (iv) more labour migrants and education migrants leave than stay; and (v) mainly from the EU (34% leave and 20% stay). Migrants from the MENA region and Suriname & Caribbean, as well as those with low-to-middle education levels, on the contrary, tend to stay than leave. This seemingly paradoxical profile of movers who have simultaneously worse economic position and lower welfare utilization probability could be possibly explained by: (i) ineligibility for social assistance and unemployment benefit due to short-term temporary permit or insufficient years of work experience in the Netherlands; (ii) skill mismatch with the Dutch labour market, driving their outmigration for better economic opportunities; and (iii) benefit claim in their origin country.

4.2.1 Discussion

The results are, in the first place, in line with the proposition of segmented assimilation theory that assimilation is not purely dependent on the accumulation of destination-specific human capital over time, but rather pertains to the interaction with the modes of incorporation. Furthermore, the results shed light on the respective roles of entry category and ethnic origin in the interplay.

At the structural level, as the segmented assimilation theory suggests, entry categories can reflect the modes of incorporation in the receptive context. Equal opportunities of and access to full participation in the society could be hindered by discriminative government policy, law or practice. Immigration policy tends to be the least restrictive towards highly skilled migrants who enter as economic and education migrants. When it comes to family and asylum migrants, the level of constraints escalates. Integration policies which are deemed crucial to preventing social and economic exclusion of migrants fall short of reaching the most disadvantaged groups such as refugees, due to a myriad of reasons. The ineffectiveness of these policies becomes detrimental, One example is the transferability of qualifications obtained abroad. Qualifications obtained in non-western countries are usually difficult to transfer; which could be one explanation for the low returns to refugees' education and the lack of assimilation even for those with higher education. Improving transferability of qualifications obtained abroad and skill

profiling could accelerate and transform the assimilation process especially for refugees who are high-skilled.

At the individual level, the nature of migration could also indicate the level of favourable selectivity through returns to migration and education. Based on human capital migration model, Chiswick (2000) posits that favourable selectivity for labour market success in the supply of migrants is expected to be more intense for economic migrants than non-economic migrants such as tied-movers (family migrants) and refugees, and more intense for high-skilled than low-skilled workers. Such a viewpoint echoes with Ogbu's differentiation of voluntary and involuntary minorities, the diverse experiences of whom contribute to fundamentally different integration processes and educational outcomes (Ogbu & Simons, 1998). The move for economic and education migrants is by and large a rational decision after calculating the costs and benefits in expectance of higher returns to international migration. Not only are they likely to be well planned and prepared for their move in order to optimize their returns, such as having qualifications obtained abroad recognized by the Dutch authorities and learning the Dutch language, most likely they are able to stay because their skill matches with demands of the Dutch labour market. At the other end of the spectrum are asylum seekers and refugees. Forced migration due to war, conflicts or other external factors means their migration to the Netherlands is largely unexpected and unprepared, and thus their skill match with the local labour market is likely to be less optimal. Psychological trauma also adds to their difficulty in adaptation. Between these two ends are family migrants, who do not fully share the experience of voluntary nor forced migrants. For many, migration to the Netherlands is unforeseen before long. As such, their skills are to a larger extent home-country-specific rather than destination-specific. Among those who migrate for family reunification with their partner or family member who entered as asylum migrants, their nature of migration is not so different from forced migration and thus similar difficulties as asylum migrants are anticipated for this type of family migrants.

What cannot be explained by the interaction between human capital and nature of migration are the differences across regional origin within the same entry category and gender at the same education level and YSM. Equally highly skilled and statistically comparable, why are EU family migrants predicted to have successful integration into the mainstream while non-EU family migrants remain on the margins? Given the variety of potential implications from the effect of regional origin, we have controlled for some

of the important external and internal indirect effects, such as spillover of ethnic capital, ethnic concentration, and differences in the quality (i.e. human capital), aspiration for integration, residential duration, residential location, arrival year and age at migration of migrants from certain areas of origin. What could remain in the regional origin effects are: (i) existence of discrimination and/or group-based stereotypes, as consistently highlighted both by segmented assimilation theory and the literature, and (ii) cultural, traditional and linguistic distances to the host society. While we do not have data on cultural and traditional factors, their Dutch language proficiency has been indirectly captured by citizenship acquisition for more recent cohorts. In sum, ethnic penalty seems to act as an additional condition upon the interaction between nature of migration and human capital.

5. Robustness Check

5.1 Other specifications: Social assistance receipt as the dependent variable

We tried to re-estimate the regressions separately for social assistance receipt and unemployment benefit receipt, the latter of which suffers the problem of over-concentration of zeroes. Estimation results from using social assistance receipt alone as the dependent variable appear primarily consistent with our main estimation results, and show that our main estimation results have been mainly driven by the receipt of social assistance. In spite of that, certain differences are worth mentioning as they shed light on the interesting dynamics of benefit substitution.

With regards to the assimilation outcome, the patterns show to be rather consistent albeit less optimistic when the dependent variable changes from the composite welfare measure to social assistance receipt probability alone. The main differences include: (i) more of first-generation immigrants with low education level predicted for working-class assimilation fall into the prediction of no assimilation; (ii) slightly more groups of migrants are predicted for working-class assimilation; (iii) migrants from the MENA region with high education level, regardless of their entry category, are predicted to assimilate to the working class, which shows a more prominent ethnic penalty effect; and (iv) the only groups that have more favourable outcomes are asylum migrants with middle-to-high education levels from Asia and other Europe, for whom assimilation out

of social assistance is predicted but the risk of unemployment remains higher than average Dutch natives. Such differences are partly due to the fact that, as mentioned in Section 4.2, Dutch natives are less likely to receive social assistance relative to first-generation immigrants than unemployment benefit, and hence the thresholds for working-class assimilation and no assimilation are lowered to a greater extent (from 0.12 to 0.09 and from 0.24 to 0.18 respectively) than the reduction in predicted probabilities of social assistance receipt for migrants.

While the coefficient estimates remain largely similar, being a labour migrant reduces the probability of social assistance receipt more strongly whereas being an education migrant reduces the probability of social assistance receipt less strongly than when both social assistance and unemployment benefit are examined altogether. The effects of these two types of migrants have converged to a similar size when only social assistance receipt is considered. Such a difference points to the fact that while labour migrants are more likely to receive unemployment benefit. The effects of having middle and high education levels have further strengthened on social assistance receipt, but the effect of having unknown education level has declined to a level more comparable to the effect of having middle education level than the effect of higher education. The effect of lagged status in increasing the probability of social assistance receipt has also intensified.

5.2 Sensitivity to threshold setting

Predictions made regarding the assimilation outcomes have been based on a selected threshold, that is, the average value of predicted probability for Dutch natives with low education level at age=39-60 (0.120). Given the 95% confidence interval of average predicted probability for Dutch natives with low education level to be between 0.116-0.124, we have also considered other thresholds adjacent to this range: (1) the lower bound of 95% confidence interval for Dutch natives with low education level (0.120); (2) mean value between predicted probability for average Dutch natives and Dutch natives with low education level (0.086); and (3) upper bound of 95% confidence interval for Dutch natives with middle education level (0.058). Except that the value of the third option is too low and too close to predicted probability for average Dutch natives (0.052), the other two options are within reasonable scope. While it is obvious that more subgroups would fall out of mainstream assimilation if lower thresholds are chosen for

assimilation into the working class and vice versa, the assimilation patterns summarized in the previous sections remains valid.

Specifically, under the second threshold, the boundary shift of mainstream assimilation would exclude all labour and education migrants with low education level and the majority of labour and education migrants with middle education level, but labour migrants with middle education level from EU countries and other Europe as well as education migrants with middle education level from EU countries, Asia, Americas & Oceania and other Europe (men only) remain exempted. The most distinct difference is that highly skilled economic migrants from the MENA region and more groups of family migrants at all education levels (mainly except EU family migrants with middle, high or unknown education level and highly educated family migrants from Asia, Americas & Oceania and Suriname & Caribbean) would then be categorized as at risk of working-class assimilation instead. For asylum migrants, little is changed with the change in threshold. Such results by and large align with the predicted pattern that non-economic migrants are in general worse-off than economic migrants, and that ethnic penalty and nature of migration are more decisive than human capital.

6. Conclusion

Economic assimilation of immigrants, which is not only a significant indicator of their own success, but also of their overall contribution to the host country's economy, is both an intragenerational and intergenerational process. While the immigrant-native gap in economic outcomes is expected to diminish across generations, results from this research suggest that automatic closing of such gap over time should not be presumed if a level playing field is not provided for all regardless of their type of immigration and ethnic background. In the Dutch context, substantial gap in welfare utilization propensities, as a reflection of economic marginalization, is predicted to persist throughout the working-age life course between Dutch natives and migrants from certain areas of origin and entry categories, who are likely to remain marginalized despite display of their motivation to integrate and notable upward mobilities achieved. The most disadvantaged would not even have the chance to assimilate to the working class, suggesting prospective emergence of an ethnic underclass at the bottom of the economic ladder.

While individual factors emphasized in classic theories such as years since migration and human capital remain important in explaining the welfare assimilation outcomes, in line with predictions from segmented assimilation theory, their interaction with the modes of incorporation in the receptive context matters for the first generation. What appears to determine which assimilation path one could follow is the differential interaction effects between regional origin and human capital conditioned upon the contextual nature of migration. With much less stringent immigration and integration conditions, voluntary skilled migrants, such as labour and education migrants, have much higher returns to their education than family migrants who are tied movers and refugees who are forced migrants. While higher education seems to offset the ethnic penalty faced by family migrants with non-EU origin, it only minimally reduces the level of disadvantage for asylum migrants, despite remarkable reductions in their welfare utilization propensities through their working-age life course.

The observed patterns shed light on the importance and consequence of government policies that can eliminate such concentrated disadvantages in the labour market integration of first-generation immigrants with non-EU origin and non-economic migration purposes. For example, improving transferability of qualifications obtained abroad could not only accelerate but transform the assimilation process for many, especially the highly-skilled refugees who are hindered from full participation in and contribution to the host society due to unnecessary structural barriers.

The results also illustrate the misleading nature of the rhetoric about immigrants as one homogenous group. Discrepancy between refugees and other types of migrants has been observed in both the patterns and determinants of welfare assimilation, which points to their fundamentally different nature of migration and thereby the need for different sets of policies. While long-term planning of immigration policy is possible due to predictability of the number and characteristics of migrants, the inflow of refugees due to an outburst of war is unpredictable in nature. For migrants, perhaps it is still reasonable to consider their potential economic costs and contributions so that a sensible admission policy could be formulated to promote sustainable development of the host country. Applying the same scale of economic calculation to refugees, who bear significant disadvantages due to traumatic experiences of fleeing war, conflict or prosecution, would be all but dehumanizing. Political commitment to signed

international conventions remains important when it comes to protection of forced migrants.

Redefining assimilation from an absolute to a relative concept, the exploration of whether the process of immigrant adaptation has become segmented broadens and contextualizes the discussion onto the increasingly divided nature of contemporary societies with pervasive vertical and horizontal inequalities, if not stratification. The segmented assimilation theory, while offering new perspectives of potential diversity of the assimilation process, has yet to offer a solid methodology to unambiguously test the empirical validity of its core concepts. Confined to identifying the relevance of modes of incorporation to the disadvantaged position among similar immigrants, the fundamental question of whether they assimilate to a different segment to the middle class was left unanswered. Besides complementing such methodological gap through offering alternative means of operationalization, this research contributes to the literature by expanding the descriptive and explanatory functions of the conventional welfare assimilation model through bridging the literature in the economics and sociology disciplines, and by undertaking a dynamic life-course approach in welfare assimilation analysis.

Due to our explicit focus on the aggregate trend, predictions by the country of origin were not provided, from which informative indications could be drawn regarding the extent of integration among specific ethnic minorities in the Netherlands. Despite the presence of missing information and measurement error on the entry category and especially education level variables, we have demonstrated the limited extent of such problems. Further research is needed to identify the cultural mechanism underlying segmented assimilation.

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Appendix 1: Coefficient estimates of dynamic CRE probit model for Dutch natives

Table 5: Regression output for Dutch natives

Welfare receipt	Dutch natives
Lagged status	1.626***
	(0.016)
Education level	
Low	(Ref. group)
Middle	-0.246***
	(0.014)
High	-0.625***
	(0.016)
Unknown	-0.845***
	(0.015)
Female dummy	-0.013
	(0.010)
Household category	
Single-person	(Ref. group)
Unmarried without kids	-0.164***
	(0.023)
Unmarried with kids	-0.202***
	(0.028)
Married without kids	-0.094***
	(0.029)
Married with kids	-0.211***
	(0.023)
Single-parent	0.128***
	(0.026)
Other	-0.111
	(0.068)
Institutional	0.0204
	(0.065)
Age	0.179***
	(0.013)
Age-squared	-0.002***
	(0.000)
Provincial unemployment rate	0.019**
	(0.007)
Observation year	
2008	(Ref. group)
2009	0.217***
	(0.018)
2010	0.150***

	(0.020)
2011	0.129***
	(0.020)
2012	0.238***
	(0.021)
2013	0.296***
	(0.031)
2014	0.206***
	(0.033)
2015	0.116***
	(0.030)
Province	
Groningen	(Ref. group)
Friesland	0.133
	(0.114)
Drenthe	0.0633
	(0.100)
Overijssel	-0.008
	(0.108)
Flevoland	-0.059
	(0.136)
Gelderland	0.027
	(0.100)
Utrecht	-0.015
	(0.104)
North-Holland	-0.052
	(0.099)
South-Holland	-0.118
	(0.0990)
Zeeland	-0.178
	(0.165)
North-Brabant	-0.075
	(0.106)
Limburg	0.138
	(0.126)
Initial status	0.733***
	(0.094)
Time-averages	
Household category	
Single-person	0.712***
	(0.256)
Unmarried without kids	0.298
	(0.257)
Unmarried with kids	0.202
	(0.257)
Married without kids	0.420
	(0.258)
Married with kids	0.224
	(0.255)

Single-parent	0.693***
	(0.257)
Other	0.366
	(0.286)
Institutional	0.464*
	(0.277)
Groningen	-0.327
	(0.316)
Friesland	-0.555*
	(0.311)
Drenthe	-0.561*
	(0.305)
Overijssel	-0.598**
	(0.290)
Flevoland	-0.481
	(0.336)
Gelderland	-0.788***
	(0.265)
Utrecht	-0.829***
	(0.275)
North-Holland	-0.711**
	(0.282)
South-Holland	-0.519*
	(0.295)
Zeeland	-0.684**
	(0.320)
North-Brabant	-0.610**
	(0.277)
Limburg	-0.746**
	(0.300)
Provincial unemployment rate	-0.096***
	(0.031)
Constant	-4.456***
	(0.293)
Sigma_u	0.597
	(0.012)
Rho	0.263
	(0.008)
Number of observations	580,834
Number of individuals	85,786

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix 2: Predicted assimilation outcome for disadvantaged groups given naturalization

Table 6: Predicted welfare assimilation outcome for disadvantaged groups by regional origin, entry category, education level and gender (Assuming age at migration at 18 and having naturalized)

		Labour migrant				Education migrant				Family migrant				Asylum migrant			
		Low	Mid	High	Unknown	Low	Mid	High	Unknown	Low	Mid	High	Unknown	Low	Mid	High	Unknown
EU	M																
	F																
Other Europe	M					0.07 (++)				0.17 (=)	0.12 (++)			0.24 (+)	0.17 (=)	0.13 (=)	0.12 (++)
	F					0.11 (++)				0.22 (=)	0.14 (=)			0.29 (=)	0.19 (=)	0.14 (=)	0.15 (=)
MENA	M	0.25 (=)	0.14 (=)		0.12 (++)	0.23 (+)	0.13 (=)		0.10 (++)	0.28 (=)	0.16 (=)	0.14 (=)	0.13 (=)	0.34 (=)	0.21 (=)	0.17 (=)	0.20 (=)
	F	0.30 (=)	0.14 (=)		0.15 (=)	0.28 (=)	0.13 (=)		0.13 (=)	0.31 (=)	0.16 (=)	0.14 (=)	0.16 (=)	0.40 (=)	0.22 (=)	0.18 (=)	0.25 (=)
Sub-Saharan Africa	M	0.20 (=)	0.10 (++)		0.18 (=)	0.09 (++)			0.07 (+)	0.31 (=)	0.17 (=)	0.13 (=)	0.14 (=)	0.40 (=)	0.25 (=)	0.19 (=)	0.26 (=)
	F	0.31 (=)	0.14 (=)		0.30 (=)	0.14 (+)	0.07 (++)		0.16 (=)	0.43 (=)	0.23 (=)	0.14 (=)	0.26 (=)	0.51 (=)	0.31 (=)	0.20 (=)	0.33 (=)
Asia	M	0.06 (++)				0.06 (++)				0.07 (++)				0.24 (=)	0.14 (=)		
	F	0.07 (++)				0.06 (++)				0.08 (++)				0.24 (=)	0.14 (=)		
Americas & Oceania	M	0.08 (++)								0.09 (++)							
	F	0.10 (++)				0.06 (++)				0.12 (++)	0.10 (+)						
Suriname & Caribbean	M	0.14 (=)				0.13 (=)				0.18 (=)	0.15 (=)			0.35 (=)	0.21 (=)		0.14 (=)
	F	0.15 (+)				0.15 (+)				0.20 (=)	0.16 (=)			0.40 (=)	0.23 (=)		0.15 (=)

Destination of assimilation (in colour)
Assimilation to the middle class: Average natives (pr<0.120)
Assimilation to the working class: Natives with low education level (pr>0.120)
No assimilation: Above predicted probability for natives with low education level (pr>0.240)

Parity with average natives (in bold): pr<0.052

Changes in assimilation outcome after additionally assuming naturalization (in bracket)
Upward mobility:
- From no assimilation to middle class: +++
- From working class to middle class ++
- From no assimilation to working class: +

Stagnation: =
Downward mobility: —

Note: Average probabilities of welfare utilization assuming age at migration at 18 and having naturalized are reported up to 2 decimal points. All predicted probabilities are statistically significant at 1% level. T-tests have been performed to compare each predicted probability against specific thresholds mentioned in the legend

Appendix 3: Full regression results of dynamic CRE probit model of welfare receipt probability for first-generation immigrants

Table 7: Determinants of welfare receipt probability

Welfare receipt	All immigrants	EU	Other Europe	MENA	Sub-Saharan Africa	Asia	Americas & Oceania	Suriname & Caribbean
Lagged status	1.855***	1.354***	1.901***	2.114***	1.522***	2.250***	1.628***	1.801***
	(0.00631)	(0.0158)	(0.0156)	(0.0135)	(0.0177)	(0.0196)	(0.0378)	(0.0128)
YSM	-0.027***	-0.001	0.047**	-0.125***	-0.104***	0.040**	0.064*	0.087***
	(0.00571)	(0.0108)	(0.0189)	(0.0127)	(0.0185)	(0.0192)	(0.0347)	(0.0211)
YSM-squared	0.001***	0.000	-0.001	0.004***	0.003***	-0.001	-0.001	-0.003***
	(0.0002)	(0.0005)	(0.0007)	(0.0005)	(0.0008)	(0.0007)	(0.0014)	(0.0007)
Area of origin								
EU	(Ref. group)							
Other Europe	0.355***							
	(0.0089)							
MENA	0.599***							
	(0.00870)							
Sub-Saharan Africa	0.491***							
	(0.0104)							
Asia	0.028***							
	(0.0092)							
Americas & Oceania	0.004							
	(0.0133)							
Suriname & Caribbean	0.270***							
	(0.0083)							
Share of high educated co-nationals	-0.008***	0.019***	-0.003	-0.006***	-0.038***	-0.040***	-0.022***	-0.011***
	(0.0005)	(0.0011)	(0.0020)	(0.0017)	(0.0019)	(0.0018)	(0.0045)	(0.0012)
Share of co-nationals in municipality	-0.004***	-0.013***	0.026***	0.000	-0.292***	-0.061***	-0.503***	-0.006***
	(0.0008)	(0.0026)	(0.0030)	(0.0022)	(0.0154)	(0.0141)	(0.0809)	(0.0014)
Naturalization dummy	-0.139***	0.00960	-0.197***	-0.189***	-0.238***	-0.0550***	0.0641**	-0.102***
	(0.00556)	(0.0147)	(0.0120)	(0.0105)	(0.0178)	(0.0171)	(0.0319)	(0.0182)
Family migrant dummy	0.113***	-0.0963***	0.0584	0.0789**	0.411***	0.0446	0.239***	0.0524
	(0.0132)	(0.0240)	(0.0420)	(0.0360)	(0.0514)	(0.0405)	(0.0661)	(0.0371)
Asylum migrant dummy	0.486***	0.158*	0.422***	0.348***	0.770***	0.366***	0.664***	0.440***
	(0.0147)	(0.0948)	(0.0462)	(0.0368)	(0.0519)	(0.0493)	(0.211)	(0.0416)
Labour migrant dummy	-0.0738***	-0.0487**	-0.0897*	-0.212***	-0.128**	-0.0948**	0.148**	-0.248***
	(0.0139)	(0.0197)	(0.0482)	(0.0451)	(0.0612)	(0.0465)	(0.0710)	(0.0461)
Education migrant dummy	-0.350***	-0.438***	-0.279***	-0.242***	-0.172***	-0.205***	-0.187**	-0.280***
	(0.0176)	(0.0352)	(0.0549)	(0.0481)	(0.0622)	(0.0458)	(0.0791)	(0.0490)
Age at migration	0.0319***	0.0256***	0.0238***	0.0313***	0.0482***	0.0290***	0.0434***	0.0350***
	(0.0008)	(0.0019)	(0.0023)	(0.0017)	(0.0030)	(0.0028)	(0.0045)	(0.0016)
Age at migration squared	-0.000***	-0.000***	-0.000*	-0.000***	-0.001***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Remigration dummy	-0.140***	-0.121***	-0.0889***	-0.173***	-0.252***	-0.163***	-0.284***	-0.0339*
	(0.0094)	(0.0200)	(0.0263)	(0.0221)	(0.0305)	(0.0320)	(0.0546)	(0.0194)
Cohort								
Before 1995	(Ref. group)							
1995-1999	-0.158***	-0.00228	-0.0166	-0.0227	-0.393***	-0.0229	-0.154	-0.262***
	(0.0188)	(0.0463)	(0.0528)	(0.0419)	(0.0704)	(0.0586)	(0.107)	(0.0488)
2000-2004	-0.174***	-0.0713	0.0340	-0.0392	-0.540***	-0.0361	0.00758	-0.282***

	(0.0297)	(0.0839)	(0.0761)	(0.0562)	(0.106)	(0.0907)	(0.178)	(0.0788)
2005-2009	-0.296***	-0.183*	-0.0344	-0.271***	-0.658***	-0.0631	-0.0245	-0.373***
	(0.0376)	(0.104)	(0.0938)	(0.0704)	(0.131)	(0.112)	(0.216)	(0.102)
2010-2015	-0.413***	-0.243**	-0.0177	-0.452***	-1.028***	-0.0881	-0.0157	-0.210
	(0.0434)	(0.112)	(0.117)	(0.0865)	(0.146)	(0.130)	(0.245)	(0.134)
Education level								
Low	(Ref. group)							
Middle	-0.132***	-0.106***	-0.0501***	-0.149***	-0.148***	-0.0831***	-0.101***	-0.212***
	(0.00572)	(0.0152)	(0.0152)	(0.0118)	(0.0205)	(0.0182)	(0.0362)	(0.0108)
High	-0.260***	-0.247***	-0.153***	-0.275***	-0.184***	-0.158***	-0.165***	-0.476***
	(0.00750)	(0.0172)	(0.0210)	(0.0159)	(0.0317)	(0.0210)	(0.0394)	(0.0162)
Unknown	-0.397***	-0.773***	-0.254***	-0.233***	-0.115***	-0.430***	-0.629***	-0.482***
	(0.00490)	(0.0142)	(0.0111)	(0.00949)	(0.0163)	(0.0154)	(0.0349)	(0.0106)
Female	0.0234***	0.0282***	-0.00964	0.0800***	0.0941***	0.0289**	0.0591**	-0.0225**
	(0.00445)	(0.0109)	(0.0109)	(0.00917)	(0.0184)	(0.0128)	(0.0273)	(0.00923)
Unmarried without kids	-0.123***	-0.113***	-0.131***	-0.0904***	-0.153***	-0.0838**	-0.0900*	-0.128***
	(0.00956)	(0.0194)	(0.0311)	(0.0243)	(0.0279)	(0.0350)	(0.0505)	(0.0185)
Unmarried with kids	-0.164***	-0.116***	-0.139***	-0.111***	-0.191***	-0.192***	-0.268***	-0.202***
	(0.0116)	(0.0281)	(0.0329)	(0.0291)	(0.0333)	(0.0437)	(0.0692)	(0.0204)
Married without kids	-0.179***	-0.234***	-0.157***	-0.101***	-0.195***	-0.140***	-0.238***	-0.246***
	(0.0126)	(0.0309)	(0.0292)	(0.0252)	(0.0550)	(0.0392)	(0.0726)	(0.0298)
Married with kids	-0.184***	-0.190***	-0.183***	-0.110***	-0.221***	-0.192***	-0.348***	-0.212***
	(0.00995)	(0.0272)	(0.0240)	(0.0192)	(0.0348)	(0.0350)	(0.0616)	(0.0224)
Single-parent	0.191***	0.204***	0.305***	0.311***	0.303***	0.146***	0.270***	0.0663***
	(0.0100)	(0.0280)	(0.0271)	(0.0233)	(0.0302)	(0.0378)	(0.0584)	(0.0175)
Other	-0.0770***	-0.0646	-0.0670	-0.0848***	-0.0441	-0.0126	0.110	-0.0845**
	(0.0190)	(0.0561)	(0.0574)	(0.0328)	(0.0581)	(0.0739)	(0.128)	(0.0393)
Institutional	-0.140***	0.0734	0.0746	-0.333***	-0.181***	0.0912	0.539***	-0.0219
	(0.0212)	(0.0707)	(0.0781)	(0.0431)	(0.0518)	(0.0972)	(0.147)	(0.0366)
Provincial unemployment	0.00683*	0.0239**	-0.00373	-0.00806	0.0410***	-0.00116	0.00604	0.00852
rate	(0.00355)	(0.00947)	(0.00788)	(0.00725)	(0.0124)	(0.0119)	(0.0227)	(0.00795)
Observation year								
2008	(Ref. group)							
2009	0.171***	0.191***	0.166***	0.161***	0.124***	0.165***	0.247***	0.222***
	(0.00691)	(0.0203)	(0.0162)	(0.0139)	(0.0236)	(0.0227)	(0.0449)	(0.0142)
2010	0.0918***	0.0912***	0.0499***	0.102***	0.0788***	0.104***	0.0938*	0.160***
	(0.00819)	(0.0231)	(0.0190)	(0.0165)	(0.0281)	(0.0271)	(0.0532)	(0.0174)
2011	0.0760***	0.0934***	0.0222	0.0821***	0.0814***	0.0334	0.183***	0.156***
	(0.00830)	(0.0229)	(0.0193)	(0.0168)	(0.0286)	(0.0278)	(0.0535)	(0.0177)
2012	0.120***	0.156***	0.0878***	0.0928***	0.120***	0.0868***	0.183***	0.217***
	(0.00977)	(0.0260)	(0.0217)	(0.0197)	(0.0343)	(0.0322)	(0.0630)	(0.0222)
2013	0.153***	0.165***	0.156***	0.153***	0.0724	0.142***	0.224**	0.255***
	(0.0148)	(0.0386)	(0.0332)	(0.0301)	(0.0518)	(0.0491)	(0.0949)	(0.0334)
2014	0.093***	0.113***	0.0768**	0.0903***	0.0269	0.0428	0.197**	0.209***
	(0.0154)	(0.0401)	(0.0346)	(0.0312)	(0.0539)	(0.0512)	(0.0978)	(0.0349)
2015	-0.000	0.002	-0.035	0.0102	0.003	-0.009	0.106	0.116***
	(0.0138)	(0.0359)	(0.0313)	(0.0279)	(0.0483)	(0.0456)	(0.0866)	(0.0309)
Province								
Groningen	(Ref. group)							
Friesland	0.0678	-0.204	-0.0865	0.440***	0.230	-0.268	0.183	-0.0475
	(0.0573)	(0.158)	(0.187)	(0.116)	(0.147)	(0.174)	(0.364)	(0.124)
Drenthe	-0.102*	-0.0261	-0.342*	0.0824	0.0296	-0.175	0.452	-0.256**

	(0.0570)	(0.156)	(0.182)	(0.117)	(0.144)	(0.181)	(0.398)	(0.121)
Overijssel	0.125**	-0.250*	0.0357	0.469***	0.240*	-0.174	0.634**	-0.0984
	(0.0509)	(0.139)	(0.145)	(0.101)	(0.141)	(0.170)	(0.299)	(0.114)
Flevoland	-0.194***	-0.490***	0.131	0.0700	-0.386***	-0.491***	0.0484	-0.319***
	(0.0499)	(0.148)	(0.161)	(0.105)	(0.138)	(0.167)	(0.286)	(0.0974)
Gelderland	0.194***	-0.199	-0.0446	0.615***	0.447***	0.0139	0.227	-0.0793
	(0.0467)	(0.122)	(0.138)	(0.0966)	(0.130)	(0.154)	(0.274)	(0.0998)
Utrecht	0.111**	-0.265**	-0.118	0.437***	0.703***	-0.0728	0.538**	-0.343***
	(0.0477)	(0.126)	(0.141)	(0.0965)	(0.133)	(0.161)	(0.267)	(0.103)
North-Holland	0.0871**	-0.277**	-0.0846	0.487***	0.652***	-0.290**	0.410*	-0.332***
	(0.0430)	(0.113)	(0.130)	(0.0908)	(0.120)	(0.142)	(0.236)	(0.0891)
South-Holland	0.154***	-0.522***	-0.0538	0.608***	0.751***	-0.179	0.243	-0.159*
	(0.0418)	(0.113)	(0.126)	(0.0878)	(0.115)	(0.140)	(0.237)	(0.0855)
Zeeland	0.0339	-0.328**	-0.177	0.571***	0.306	-0.0790	0.0141	-0.380**
	(0.0687)	(0.162)	(0.210)	(0.148)	(0.190)	(0.216)	(0.425)	(0.151)
North-Brabant	0.0609	-0.371***	-0.0791	0.423***	0.605***	-0.0744	0.252	-0.279***
	(0.0456)	(0.119)	(0.136)	(0.0958)	(0.122)	(0.151)	(0.266)	(0.0983)
Limburg	0.0317	-0.0754	0.0692	0.239**	0.262*	-0.414**	0.581*	-0.180
	(0.0516)	(0.129)	(0.154)	(0.106)	(0.142)	(0.173)	(0.301)	(0.116)
Initial status	0.592***	0.336***	0.737***	0.317***	0.696***	0.702***	1.142***	0.647***
	(0.0157)	(0.0371)	(0.0575)	(0.0313)	(0.0387)	(0.0524)	(0.125)	(0.0354)
Time-averages								
Household type								
Single-person	-0.730***	-0.267	-1.344	-1.373**	-1.898**	-0.228	0.644	0.0307
	(0.281)	(0.536)	(1.168)	(0.630)	(0.812)	(1.205)	(1.759)	(0.594)
Unmarried without kids	-1.106***	-0.289	-1.760	-2.079***	-2.760***	-0.523	0.323	-0.613
	(0.281)	(0.536)	(1.169)	(0.632)	(0.815)	(1.206)	(1.760)	(0.594)
Unmarried with kids	-1.176***	-0.428	-1.711	-1.967***	-2.850***	-0.470	0.281	-0.579
	(0.281)	(0.537)	(1.169)	(0.631)	(0.817)	(1.205)	(1.761)	(0.595)
Married without kids	-0.967***	-0.215	-1.622	-1.697***	-2.325***	-0.369	0.423	-0.432
	(0.281)	(0.537)	(1.169)	(0.632)	(0.814)	(1.206)	(1.761)	(0.594)
Married with kids	-1.125***	-0.496	-1.713	-1.841***	-2.337***	-0.434	0.312	-0.620
	(0.281)	(0.536)	(1.168)	(0.631)	(0.813)	(1.205)	(1.760)	(0.594)
Single-parent	-0.560**	0.00721	-1.162	-1.500**	-1.654**	-0.0573	0.817	0.101
	(0.281)	(0.537)	(1.169)	(0.631)	(0.812)	(1.206)	(1.759)	(0.594)
Other	-1.308***	-0.588	-1.807	-1.841***	-2.887***	-0.397	0.397	-0.468
	(0.284)	(0.548)	(1.175)	(0.633)	(0.825)	(1.212)	(1.785)	(0.599)
Institutional	-0.00826	0.443	-1.650	-0.715	-1.640**	-0.134	0.701	0.652
	(0.281)	(0.535)	(1.169)	(0.630)	(0.811)	(1.210)	(1.765)	(0.593)
Province								
Groningen	0.554*	-0.376	0.668	1.549**	2.277***	0.0571	-0.281	-0.350
	(0.284)	(0.545)	(1.175)	(0.638)	(0.816)	(1.219)	(1.770)	(0.599)
Friesland	0.636**	0.0891	0.925	1.091*	2.016**	0.516	-0.573	-0.200
	(0.285)	(0.553)	(1.184)	(0.638)	(0.818)	(1.219)	(1.790)	(0.604)
Drenthe	0.778***	-0.108	1.239	1.452**	2.367***	0.321	-1.040	-0.108
	(0.286)	(0.559)	(1.184)	(0.641)	(0.820)	(1.223)	(1.811)	(0.606)
Overijssel	0.442	0.0813	0.543	1.048*	1.975**	0.232	-0.846	-0.378
	(0.283)	(0.543)	(1.173)	(0.634)	(0.814)	(1.214)	(1.766)	(0.599)
Flevoland	0.593**	0.146	0.362	1.249**	2.325***	0.501	-0.226	-0.327
	(0.282)	(0.545)	(1.178)	(0.635)	(0.813)	(1.215)	(1.764)	(0.594)
Gelderland	0.391	-0.0549	0.869	0.840	1.850**	0.0132	-0.634	-0.428
	(0.281)	(0.536)	(1.171)	(0.632)	(0.812)	(1.211)	(1.758)	(0.594)
Utrecht	0.290	-0.171	0.649	0.854	1.403*	0.106	-1.197	-0.353
	(0.282)	(0.537)	(1.172)	(0.632)	(0.812)	(1.211)	(1.758)	(0.595)
North-Holland	0.291	-0.0974	0.584	0.712	1.359*	0.314	-0.887	-0.304
	(0.280)	(0.534)	(1.170)	(0.631)	(0.808)	(1.208)	(1.749)	(0.591)

South-Holland	0.275	0.250	0.638	0.676	1.314	0.145	-0.636	-0.448
	(0.280)	(0.533)	(1.169)	(0.630)	(0.806)	(1.208)	(1.751)	(0.590)
Zeeland	0.522*	0.149	0.887	0.875	2.113**	0.125	-0.336	-0.104
	(0.288)	(0.551)	(1.188)	(0.650)	(0.833)	(1.218)	(1.806)	(0.612)
North-Brabant	0.469*	0.170	0.728	0.907	1.708**	0.0580	-0.788	-0.271
	(0.281)	(0.534)	(1.169)	(0.631)	(0.809)	(1.208)	(1.756)	(0.593)
Limburg	0.508*	-0.154	0.725	1.116*	2.072**	0.526	-0.951	-0.261
	(0.281)	(0.535)	(1.172)	(0.632)	(0.811)	(1.212)	(1.762)	(0.595)
Provincial unemployment rate	0.058***	0.040**	0.037	0.064***	0.038	0.046	-0.054	0.017
	(0.00922)	(0.0186)	(0.0314)	(0.0218)	(0.0299)	(0.0324)	(0.0499)	(0.0197)
Constant	-1.976***	-2.181***	-1.936***	-1.085***	-1.272***	-2.170***	-2.771***	-1.531***
	(0.0919)	(0.217)	(0.274)	(0.201)	(0.291)	(0.306)	(0.511)	(0.231)
Sigma_u	0.635	0.670	0.632	0.574	0.788	0.356	0.624	0.617
	(0.018)	(0.012)	(0.015)	(0.248)	(0.017)	(0.020)	(0.031)	(0.012)
Rho	0.287	0.310	0.286	0.248	0.383	0.112	0.280	0.276
	(0.004)	(0.008)	(0.009)	(0.009)	(0.010)	(0.011)	(0.020)	(0.008)
Number of obs.	2,026,536	426,362	318,004	393,983	139,329	230,319	79,185	439,354
Number of individuals	359,778	94,313	48,509	61,077	24,778	45,261	16,749	69,153

Note: The table reports estimated coefficients of the dynamic CRE probit models. Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Appendix 4: Full regression results of dynamic CRE probit model of social assistance receipt probability for first-generation immigrants

Table 8: Determinants of social assistance receipt probability

Social assistance receipt	All immigrants	EU	Other Europe	MENA	Sub-Saharan Africa	Asia	Americas & Oceania	Suriname & Caribbean
Lagged status	2.828***	2.965***	3.004***	2.834***	2.114***	3.116***	2.718***	2.804***
	(0.00556)	(0.0216)	(0.0102)	(0.00789)	(0.0213)	(0.0169)	(0.0468)	(0.00853)
YSM	-0.0456***	0.0230	0.00206	-0.132***	-0.131***	0.0475**	0.0428	0.0625***
	(0.00584)	(0.0156)	(0.0180)	(0.0108)	(0.0186)	(0.0221)	(0.0417)	(0.0198)
YSM-squared	0.00124***	-0.000997	0.000421	0.00401***	0.00364***	-0.00166*	-0.000792	-0.00257***
	(0.000220)	(0.000686)	(0.000636)	(0.000384)	(0.000763)	(0.000853)	(0.00168)	(0.000681)
Area of origin								
EU	(Ref. Group)							
Other Europe	0.381***							
	(0.00894)							
MENA	0.606***							
	(0.00889)							
Sub-Saharan Africa	0.435***							
	(0.0101)							
Asia	0.142***							
	(0.00954)							
Americas & Oceania	0.0944***							
	(0.0140)							
Suriname & Caribbean	0.305***							
	(0.00853)							
Share of highly educated co-nationals	-0.0105***	0.000501	0.00225	-0.00214	-0.0335***	-0.0366***	-0.0232***	-0.0103***
	(0.000521)	(0.00125)	(0.00182)	(0.00143)	(0.00201)	(0.00196)	(0.00511)	(0.00114)
Share of co-nationals in municipality	-0.00674***	-0.00765**	0.0181***	-0.000212	-0.355***	-0.101***	-0.308***	-0.00574***
	(0.000794)	(0.00309)	(0.00276)	(0.00183)	(0.0177)	(0.0184)	(0.0967)	(0.00124)
Naturalization dummy	-0.144***	0.00874	-0.174***	-0.177***	-0.254***	-0.0894***	0.0593	-0.129***
	(0.00531)	(0.0166)	(0.0107)	(0.00910)	(0.0190)	(0.0203)	(0.0386)	(0.0163)
Family migrant	0.122***	-0.0484*	0.0466	0.0577*	0.451***	0.0908*	0.246***	0.0642*
	(0.0132)	(0.0282)	(0.0378)	(0.0297)	(0.0530)	(0.0482)	(0.0796)	(0.0343)
Asylum migrant	0.392***	0.230**	0.316***	0.247***	0.782***	0.357***	0.456**	0.370***
	(0.0142)	(0.0953)	(0.0405)	(0.0302)	(0.0538)	(0.0555)	(0.220)	(0.0369)
Labour migrant	-0.206***	-0.201***	-0.122***	-0.180***	-0.212***	-0.138**	0.0382	-0.260***
	(0.0149)	(0.0243)	(0.0443)	(0.0377)	(0.0663)	(0.0562)	(0.0873)	(0.0449)
Education migrant	-0.201***	-0.342***	-0.153***	-0.169***	-0.0767	-0.133**	-0.0998	-0.169***
	(0.0178)	(0.0448)	(0.0506)	(0.0406)	(0.0645)	(0.0553)	(0.0962)	(0.0464)
Age at migration	0.0103***	0.00268	0.00586***	0.0147***	0.0338***	0.0149***	0.0206***	0.00840***
	(0.000754)	(0.00218)	(0.00215)	(0.00146)	(0.00311)	(0.00318)	(0.00495)	(0.00140)
Age at migration squared	4.32e-05***	0.000162***	0.000149***	5.01e-05*	-0.000403***	1.94e-05	-0.000104	-6.28e-05**
	(1.53e-05)	(4.05e-05)	(4.36e-05)	(2.97e-05)	(6.33e-05)	(6.19e-05)	(9.86e-05)	(3.15e-05)
Remigration	-0.0987***	-0.182***	-0.0482**	-0.123***	-0.220***	-0.143***	-0.194***	-0.0197

dummy								
	(0.00922)	(0.0269)	(0.0245)	(0.0191)	(0.0310)	(0.0378)	(0.0638)	(0.0177)
Cohort								
Before 1995	(Ref. group)							
1995-1999	-0.155***	-0.00343	-0.00444	-0.0119	-0.462***	-0.175**	-0.195	-0.241***
	(0.0180)	(0.0549)	(0.0473)	(0.0348)	(0.0722)	(0.0705)	(0.129)	(0.0443)
2000-2004	-0.165***	-0.0612	0.0636	-0.0353	-0.583***	-0.250**	-0.00461	-0.246***
	(0.0275)	(0.0995)	(0.0668)	(0.0465)	(0.108)	(0.108)	(0.213)	(0.0690)
2005-2009	-0.267***	-0.0863	-0.0151	-0.248***	-0.709***	-0.268**	-0.0398	-0.301***
	(0.0348)	(0.122)	(0.0825)	(0.0579)	(0.134)	(0.134)	(0.259)	(0.0905)
2010-2015	-0.460***	-0.243*	-0.0659	-0.420***	-1.110***	-0.250	-0.0944	-0.201*
	(0.0411)	(0.133)	(0.105)	(0.0711)	(0.148)	(0.154)	(0.294)	(0.121)
Education level								
Low	(Ref. group)							
Middle	-0.215***	-0.295***	-0.154***	-0.177***	-0.292***	-0.171***	-0.184***	-0.242***
	(0.00579)	(0.0189)	(0.0145)	(0.0105)	(0.0225)	(0.0222)	(0.0411)	(0.0100)
High	-0.382***	-0.459***	-0.293***	-0.304***	-0.365***	-0.356***	-0.437***	-0.531***
	(0.00838)	(0.0232)	(0.0212)	(0.0145)	(0.0365)	(0.0291)	(0.0519)	(0.0176)
Unknown	-0.253***	-0.546***	-0.178***	-0.162***	-0.0899***	-0.314***	-0.460***	-0.292***
	(0.00485)	(0.0179)	(0.0106)	(0.00831)	(0.0172)	(0.0172)	(0.0408)	(0.00954)
Female dummy	0.0727***	0.105***	0.0438***	0.0991***	0.198***	0.0687***	0.104***	0.0277***
	(0.00427)	(0.0137)	(0.00971)	(0.00761)	(0.0192)	(0.0156)	(0.0329)	(0.00838)
Household type								
Single-person	(Ref. group)							
Unmarried without kids	-0.198***	-0.271***	-0.208***	-0.0926***	-0.242***	-0.249***	-0.255***	-0.185***
	(0.0122)	(0.0316)	(0.0379)	(0.0265)	(0.0341)	(0.0490)	(0.0720)	(0.0224)
Unmarried with kids	-0.274***	-0.309***	-0.192***	-0.139***	-0.281***	-0.483***	-0.573***	-0.294***
	(0.0141)	(0.0422)	(0.0387)	(0.0312)	(0.0392)	(0.0569)	(0.0954)	(0.0245)
Married without kids	-0.240***	-0.307***	-0.193***	-0.141***	-0.257***	-0.371***	-0.404***	-0.306***
	(0.0155)	(0.0502)	(0.0346)	(0.0273)	(0.0686)	(0.0522)	(0.110)	(0.0378)
Married with kids	-0.249***	-0.359***	-0.221***	-0.106***	-0.298***	-0.429***	-0.718***	-0.314***
	(0.0118)	(0.0421)	(0.0282)	(0.0205)	(0.0409)	(0.0451)	(0.0881)	(0.0274)
Single-parent	0.182***	0.212***	0.291***	0.296***	0.341***	0.0757*	0.194***	0.0782***
	(0.0113)	(0.0363)	(0.0303)	(0.0243)	(0.0339)	(0.0457)	(0.0704)	(0.0195)
Other	-0.0880***	-0.0945	-0.0108	-0.111***	-0.0347	-0.0338	0.0534	-0.0814*
	(0.0226)	(0.0902)	(0.0687)	(0.0371)	(0.0683)	(0.0930)	(0.156)	(0.0446)
Institutional	-0.103***	0.245***	0.287***	-0.348***	-0.138***	0.0499	0.755***	0.0937**
	(0.0216)	(0.0787)	(0.0793)	(0.0425)	(0.0534)	(0.105)	(0.155)	(0.0373)
Provincial unemployment rate	-0.000822	-0.00594	-0.0161*	-0.00749	0.0248*	-0.0182	-0.0126	0.0166*
	(0.00417)	(0.0141)	(0.00901)	(0.00767)	(0.0140)	(0.0153)	(0.0295)	(0.00933)
Observation year								
2008	(Ref. group)							
2009	0.134***	0.169***	0.146***	0.148***	0.0662**	0.0744**	0.174***	0.160***
	(0.00827)	(0.0297)	(0.0194)	(0.0151)	(0.0271)	(0.0302)	(0.0618)	(0.0170)
2010	0.154***	0.182***	0.151***	0.159***	0.123***	0.123***	0.193***	0.177***
	(0.00964)	(0.0335)	(0.0222)	(0.0176)	(0.0318)	(0.0351)	(0.0708)	(0.0204)
2011	0.105***	0.140***	0.0813***	0.111***	0.0785**	0.0485	0.186***	0.149***

	(0.00979)	(0.0336)	(0.0226)	(0.0179)	(0.0324)	(0.0359)	(0.0717)	(0.0208)
2012	0.0907***	0.0779**	0.116***	0.0889***	0.0653*	0.0507	0.180**	0.132***
	(0.0115)	(0.0387)	(0.0250)	(0.0210)	(0.0387)	(0.0416)	(0.0834)	(0.0261)
2013	0.150***	0.210***	0.210***	0.162***	0.0503	0.144**	0.239*	0.172***
	(0.0174)	(0.0576)	(0.0382)	(0.0319)	(0.0585)	(0.0635)	(0.125)	(0.0391)
2014	0.121***	0.241***	0.159***	0.118***	0.0144	0.0719	0.248*	0.162***
	(0.0181)	(0.0595)	(0.0397)	(0.0330)	(0.0609)	(0.0661)	(0.129)	(0.0408)
2015	0.0468***	0.107**	0.0764**	0.0492*	-0.0217	0.0273	0.0790	0.105***
	(0.0162)	(0.0534)	(0.0359)	(0.0295)	(0.0546)	(0.0588)	(0.115)	(0.0361)
Province								
Groningen	(Ref. group)							
Friesland	0.166***	-0.0228	-0.0440	0.531***	0.161	-0.484**	-0.295	0.133
	(0.0620)	(0.207)	(0.201)	(0.115)	(0.153)	(0.210)	(0.458)	(0.132)
Drenthe	-0.0893	0.00304	-0.320	0.141	-0.139	-0.196	0.305	-0.253*
	(0.0618)	(0.199)	(0.196)	(0.118)	(0.155)	(0.214)	(0.444)	(0.129)
Overijssel	0.145***	-0.187	0.0365	0.458***	0.193	-0.528**	0.317	-0.0789
	(0.0556)	(0.183)	(0.160)	(0.101)	(0.151)	(0.207)	(0.371)	(0.123)
Flevoland	-0.257***	-0.347*	0.0426	0.124	-0.587***	-0.912***	-0.442	-0.415***
	(0.0554)	(0.209)	(0.181)	(0.105)	(0.150)	(0.202)	(0.360)	(0.108)
Gelderland	0.273***	-0.0449	-0.0506	0.604***	0.432***	-0.240	-0.308	0.0406
	(0.0513)	(0.163)	(0.151)	(0.0964)	(0.138)	(0.186)	(0.339)	(0.109)
Utrecht	0.159***	-0.169	-0.0813	0.502***	0.700***	-0.398**	0.0494	-0.336***
	(0.0527)	(0.172)	(0.157)	(0.0969)	(0.142)	(0.194)	(0.345)	(0.113)
North-Holland	0.143***	-0.302**	-0.0188	0.523***	0.595***	-0.611***	-0.169	-0.275***
	(0.0472)	(0.148)	(0.143)	(0.0905)	(0.128)	(0.170)	(0.295)	(0.0962)
South-Holland	0.246***	-0.385***	0.0568	0.617***	0.768***	-0.432***	-0.340	-0.148
	(0.0456)	(0.148)	(0.139)	(0.0872)	(0.122)	(0.167)	(0.293)	(0.0917)
Zeeland	0.147*	-0.289	-0.268	0.548***	0.290	-0.119	-0.0137	-0.251
	(0.0766)	(0.227)	(0.229)	(0.149)	(0.200)	(0.254)	(0.510)	(0.166)
North-Brabant	0.127**	-0.144	-0.138	0.434***	0.523***	-0.484***	-0.172	-0.227**
	(0.0504)	(0.162)	(0.151)	(0.0955)	(0.129)	(0.185)	(0.346)	(0.107)
Limburg	0.0678	-0.0276	-0.189	0.293***	0.144	-0.589***	0.126	0.0122
	(0.0568)	(0.171)	(0.171)	(0.105)	(0.151)	(0.211)	(0.374)	(0.126)
Initial welfare receipt status	0.0166	0.148**	0.0210	-0.241***	0.373***	0.136***	0.559***	0.0459*
	(0.0137)	(0.0680)	(0.0450)	(0.0227)	(0.0402)	(0.0464)	(0.123)	(0.0264)
Time-averages								
Household type								
Single-person	-0.159	0.723	-0.0657	-0.492	-1.195	-1.026	0.558	0.346
	(0.271)	(0.581)	(1.106)	(0.536)	(0.800)	(1.471)	(2.199)	(0.529)
Unmarried without kids	-0.637**	0.528	-0.350	-1.073**	-2.196***	-1.455	0.136	-0.225
	(0.272)	(0.583)	(1.108)	(0.538)	(0.804)	(1.473)	(2.201)	(0.530)
Unmarried with kids	-0.539**	0.384	-0.288	-0.909*	-2.225***	-1.125	0.138	-0.127
	(0.272)	(0.585)	(1.107)	(0.537)	(0.807)	(1.472)	(2.202)	(0.532)
Married without kids	-0.310	0.805	-0.187	-0.672	-1.655**	-0.943	0.535	0.0159
	(0.272)	(0.583)	(1.107)	(0.538)	(0.803)	(1.472)	(2.201)	(0.530)
Married with kids	-0.439	0.458	-0.274	-0.801	-1.554*	-1.005	0.412	-0.128
	(0.271)	(0.583)	(1.107)	(0.536)	(0.802)	(1.471)	(2.200)	(0.530)
Single-parent	-0.149	0.795	-0.143	-0.716	-1.054	-0.859	0.708	0.310
	(0.271)	(0.582)	(1.107)	(0.537)	(0.801)	(1.472)	(2.198)	(0.530)
Other	-0.669**	0.0786	-0.455	-0.854	-2.166***	-1.064	0.588	-0.0179
	(0.274)	(0.608)	(1.114)	(0.540)	(0.816)	(1.479)	(2.222)	(0.535)
Institutional	0.485*	1.050*	-0.405	0.233	-0.818	-0.868	0.296	0.660

	(0.271)	(0.578)	(1.107)	(0.536)	(0.799)	(1.476)	(2.199)	(0.529)
Province								
Groningen	0.449	-0.890	-0.0966	1.101**	1.908**	0.846	-0.504	-0.229
	(0.274)	(0.592)	(1.115)	(0.543)	(0.805)	(1.488)	(2.209)	(0.536)
Friesland	0.334	-0.856	-0.0109	0.496	1.768**	1.464	-0.0804	-0.291
	(0.276)	(0.608)	(1.125)	(0.545)	(0.806)	(1.488)	(2.234)	(0.542)
Drenthe	0.600**	-0.945	0.306	0.926*	2.158***	1.078	-1.047	0.0960
	(0.277)	(0.614)	(1.125)	(0.547)	(0.809)	(1.492)	(2.246)	(0.545)
Overijssel	0.257	-0.793	-0.321	0.605	1.648**	1.364	-0.770	-0.208
	(0.273)	(0.593)	(1.112)	(0.540)	(0.803)	(1.484)	(2.207)	(0.537)
Flevoland	0.504*	-0.810	-0.271	0.790	2.106***	1.619	0.0224	-0.0517
	(0.273)	(0.603)	(1.118)	(0.541)	(0.802)	(1.484)	(2.205)	(0.531)
Gelderland	0.153	-1.087*	-0.0412	0.412	1.513*	1.017	-0.179	-0.340
	(0.272)	(0.581)	(1.110)	(0.538)	(0.800)	(1.479)	(2.196)	(0.531)
Utrecht	0.121	-1.027*	-0.237	0.390	1.048	1.155	-0.893	-0.103
	(0.272)	(0.585)	(1.112)	(0.539)	(0.801)	(1.480)	(2.201)	(0.532)
North-Holland	0.116	-0.818	-0.277	0.305	1.058	1.405	-0.520	-0.132
	(0.270)	(0.577)	(1.108)	(0.537)	(0.796)	(1.476)	(2.187)	(0.526)
South-Holland	0.0115	-0.639	-0.342	0.249	0.946	1.161	-0.195	-0.259
	(0.270)	(0.575)	(1.108)	(0.536)	(0.794)	(1.476)	(2.189)	(0.526)
Zeeland	0.238	-0.894	0.0702	0.462	1.657**	0.896	-0.456	-0.0213
	(0.281)	(0.612)	(1.130)	(0.558)	(0.823)	(1.490)	(2.250)	(0.554)
North-Brabant	0.183	-1.045*	-0.116	0.479	1.375*	1.169	-0.646	-0.141
	(0.271)	(0.580)	(1.108)	(0.537)	(0.797)	(1.477)	(2.192)	(0.530)
Limburg	0.302	-1.028*	0.0996	0.624	1.839**	1.400	-0.694	-0.288
	(0.271)	(0.577)	(1.111)	(0.537)	(0.800)	(1.483)	(2.203)	(0.533)
Provincial unemployment rate	0.0668***	-0.00874	0.00692	0.0567***	0.0591*	0.0572	0.0129	0.0335*
	(0.00939)	(0.0252)	(0.0307)	(0.0195)	(0.0304)	(0.0379)	(0.0568)	(0.0180)
Constant	-2.161***	-1.716***	-1.832***	-1.417***	-1.444***	-1.860***	-2.510***	-1.898***
	(0.0934)	(0.278)	(0.269)	(0.182)	(0.300)	(0.365)	(0.603)	(0.218)
Sigma_u	0.232	0.249	0.005002	0.0866	0.671	0.00685	0.366	0.366
	(0.00967)	(0.0288)	(0.00804)	(0.0186)	(0.0217)	(0.0123)	(0.052)	(0.0524)
Rho	0.0510	0.058	0.000025	0.007441	0.311	0.0000469	0.118	0.118
	(0.00404)	(0.0127)	(0.0000805)	(0.00318)	(0.0138)	(0.000168)	(0.0299)	(0.0299)
Number of observations	2,026,536	426,362	318,004	393,983	139,329	230,319	79,185	439,354
Number of individuals	359,778	94,313	48,509	61,077	24,778	45,261	16,749	69,153

Note: The table reports estimated coefficients of the dynamic CRE probit models. Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

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