



# Ensino profissional: a escolha do curso e o impacto sobre o abandono escolar e o acesso ao ensino superior

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Dissertação de Mestrado

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Supervisors: Prof. Ana Balcão Reis, Prof. Luís Catela Nunes and Prof. Maria do Carmo Seabra

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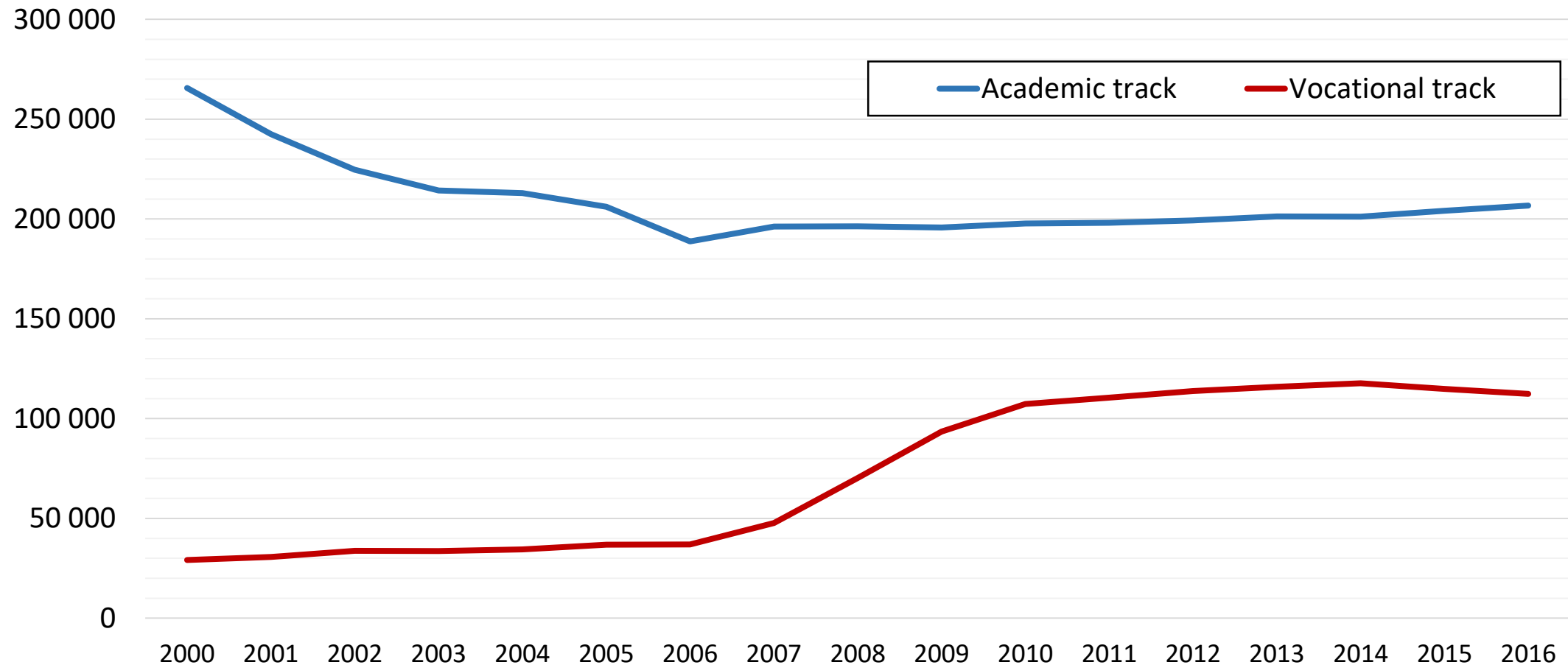
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# Motivação

Alunos matriculados no ensino secundário em Portugal



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# Revisão de literatura

## Impacto no abandono escolar:

Rasinski and Pedlow (1998)

Impacto **negativo**. O ensino profissional reduz indiretamente o abandono escolar, via aumento da “class rank” do aluno.

Agodini and Deke (2004)

Impacto **nulo**. 4 subgrupos de alunos analisados: alunos de ambientes socioeconómicos menos favoráveis, alunos com desempenhos escolares mais fracos, alunos sem expectativas de ingressar o ensino superior e alunos de escolas com rankings elevados.

Ainsworth and Roscigno (2005)

Impacto **positivo**. Utilização de variáveis binárias para cada tipo de curso profissional (“Agricultural”, “Blue Collar” e “Low-wage-service”).

# Revisão de literatura

## Impacto no ingresso no ensino superior:

DeLuca, Plank and Estacion (2006)

Efeito **negativo**. Um aluno que complete mais de metade dos créditos em disciplinas de cariz profissional apresenta uma probabilidade de frequentar o ensino superior reduzida em 80%.

Ainsworth and Roscigno (2005)

Efeito **negativo**. Ambos os cursos profissionais “Blue Collar” e “Agricultural” têm um impacto negativo no acesso ao ensino superior.



# Revisão de literatura

## Estudos em Portugal:

Mamede, Cruz and Fernandes (2015)

Impacto positivo na transição de ano; **impacto negativo no acesso ao ensino superior**; impacto não-significante sobre o abandono escolar.

Ramos, A. (2017)

Impacto negativo no acesso ao ensino superior; **probabilidade maior de abandonar a escola precocemente.**

# Revisão de literatura

**Principal preocupação?**

Corrigir os efeitos de auto-seleção



**Como?**

Separando a análise para subgrupos de estudantes

Adicionando um conjunto de variáveis controlo (“confounders”) ao modelo



**Que variáveis?**

Desempenho escolar, motivações e ambiente socioeconómico do aluno

# Contribuição

Foco de análise:

**Low performance:**

✓ Notas  **$\leq 49$**  em ambos os exames

nacionais do 9º ano

**High performance:**

✓ Notas  **$\geq 60$**  em ambos os exames

nacionais do 9º ano

# Contribuição

## Questão principal:

Que impacto tem o ensino profissional sobre as probabilidades de abandono escolar e de ingresso no ensino superior?

## Questão auxiliar:

Que fatores influenciam as escolhas educacionais dos alunos à entrada no ensino secundário?

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# Dados utilizados

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- Dados disponibilizados pela **DGEEC – Ministério da Educação**
- 4 bases de dados: **MISI, INQ-PRIV, ENEB, CNAES**
- 1 Questionário: **OTES**
- Coorte de alunos que ingressaram o 10º ano no ano letivo de 2010/11

# Dados utilizados

## Variáveis explicadas:

- Model 1: **votrack** (ensino académico é a opção omitida)
- Model 2: **dropout** (igual a 1 se o aluno abandonou a escola antes da conclusão do 12ºano, e 0 caso contrário);  
**college** (igual a 1 se o aluno ingressou o ensino superior, e 0 caso contrário)

## Variáveis explicativas:

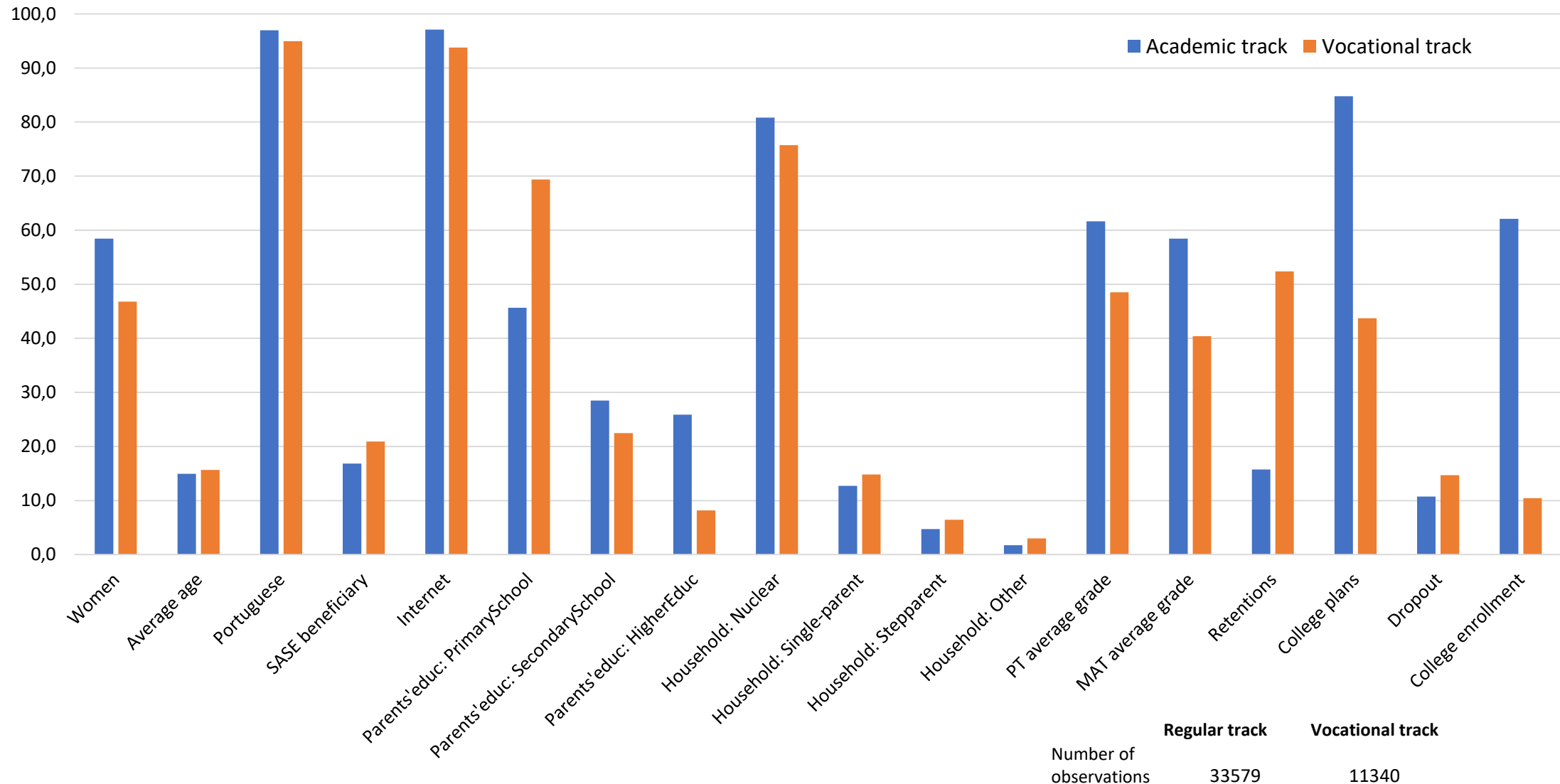
- Características do aluno: **gender, nationality**
- Ambiente socioeconómico: **subsidy, parents' education, household, access to internet**
- Desempenho escolar: **9th grade National Exams Scores, retentions, college expectations**



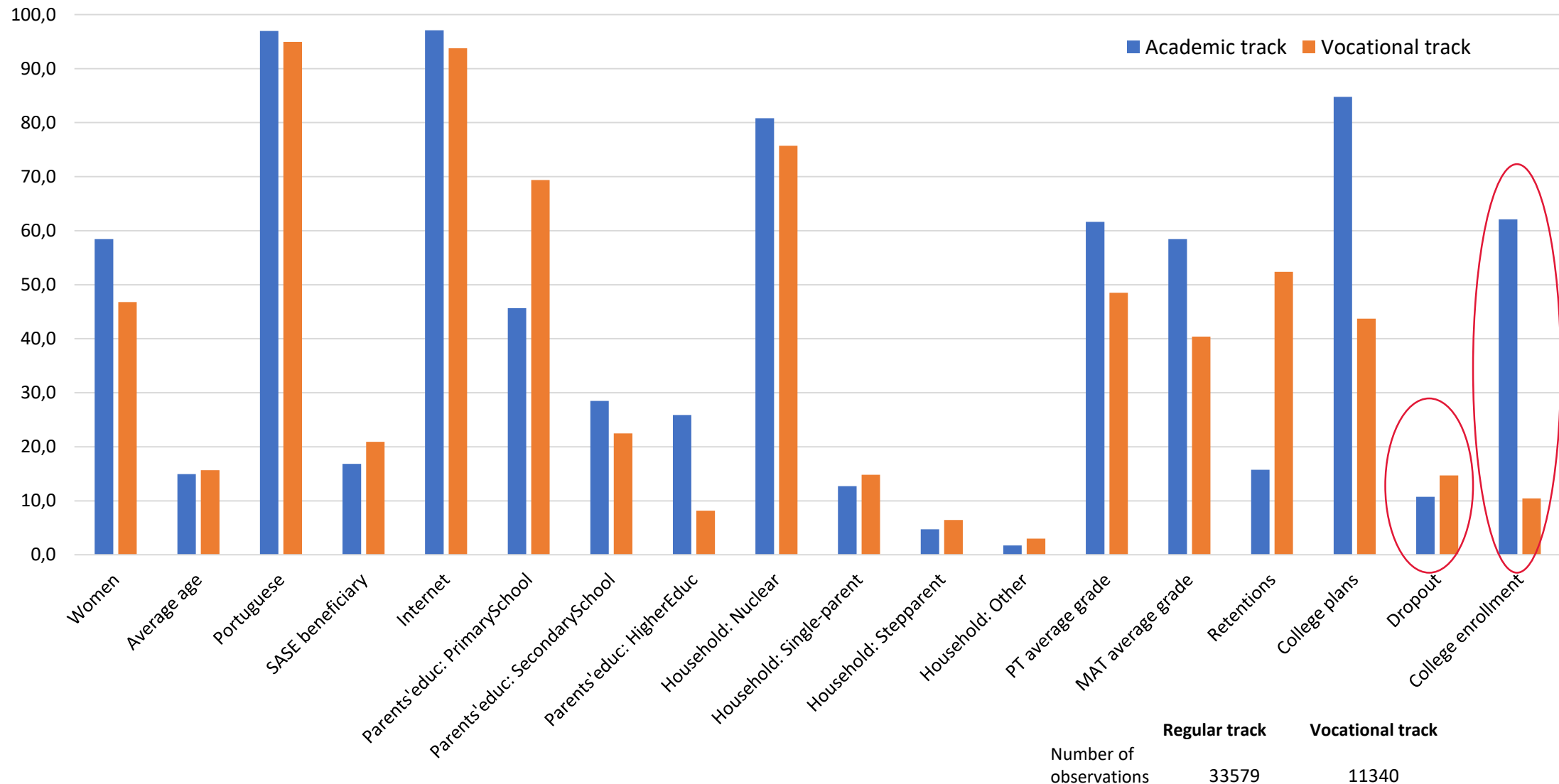
# Dados utilizados

Exogenous variables	Definition
<b>female</b>	Dummy variable equal to 1 if the student is female and 0 if male.
<b>portuguese</b>	Dummy variable equal to 1 if the student has Portuguese nationality and 0 if not.
<b>subsidy</b>	Dummy variable equal to 1 if student receives school subsidy and 0 otherwise.
<b>internet</b>	Dummy variable equal to 1 if the student has access to internet and 0 if he does not.
<b>parentaleduc:</b> <b>(basiceduc),</b> <b>second_educ,</b> <b>higher_educ</b>	Composed by 3 dummy variables: (basic_educ), second_educ and higher_educ if the parent's maximum education completed is, respectively, the primary education, secondary education or higher education degrees.
<b>household:</b> <b>(hh1), hh2, hh3, hh4</b>	Composed by 4 dummy variables: (hh1), hh2, hh3 and hh4, depending on whether the student lives in a nuclear family, single-parent family, stepfamily or another situation, respectively.
<b>examscorePT</b>	Continuous variable (ranging from 0 to 100)
<b>examscoreMATH</b>	Continuous variable (ranging from 0 to 100)
<b>retentions</b>	Dummy variable equal to 1 if the student has ever repeated a school year and 0 otherwise
<b>expectations</b>	Dummy variable equal to 1 if the student has expectations of pursuing college studies, at the beginning of his secondary school program, and 0 otherwise.

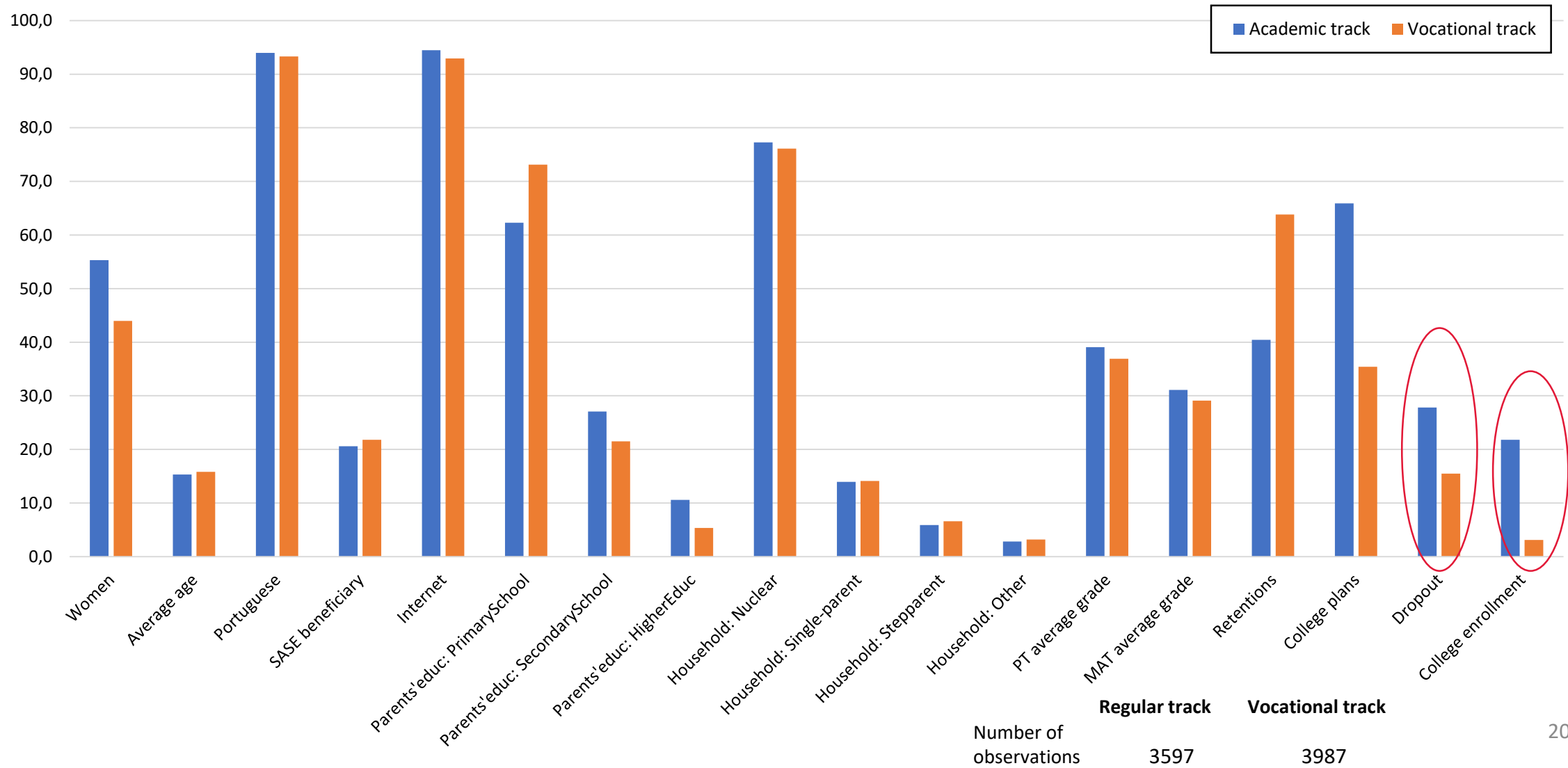
# Estatísticas descritivas – Amostra total



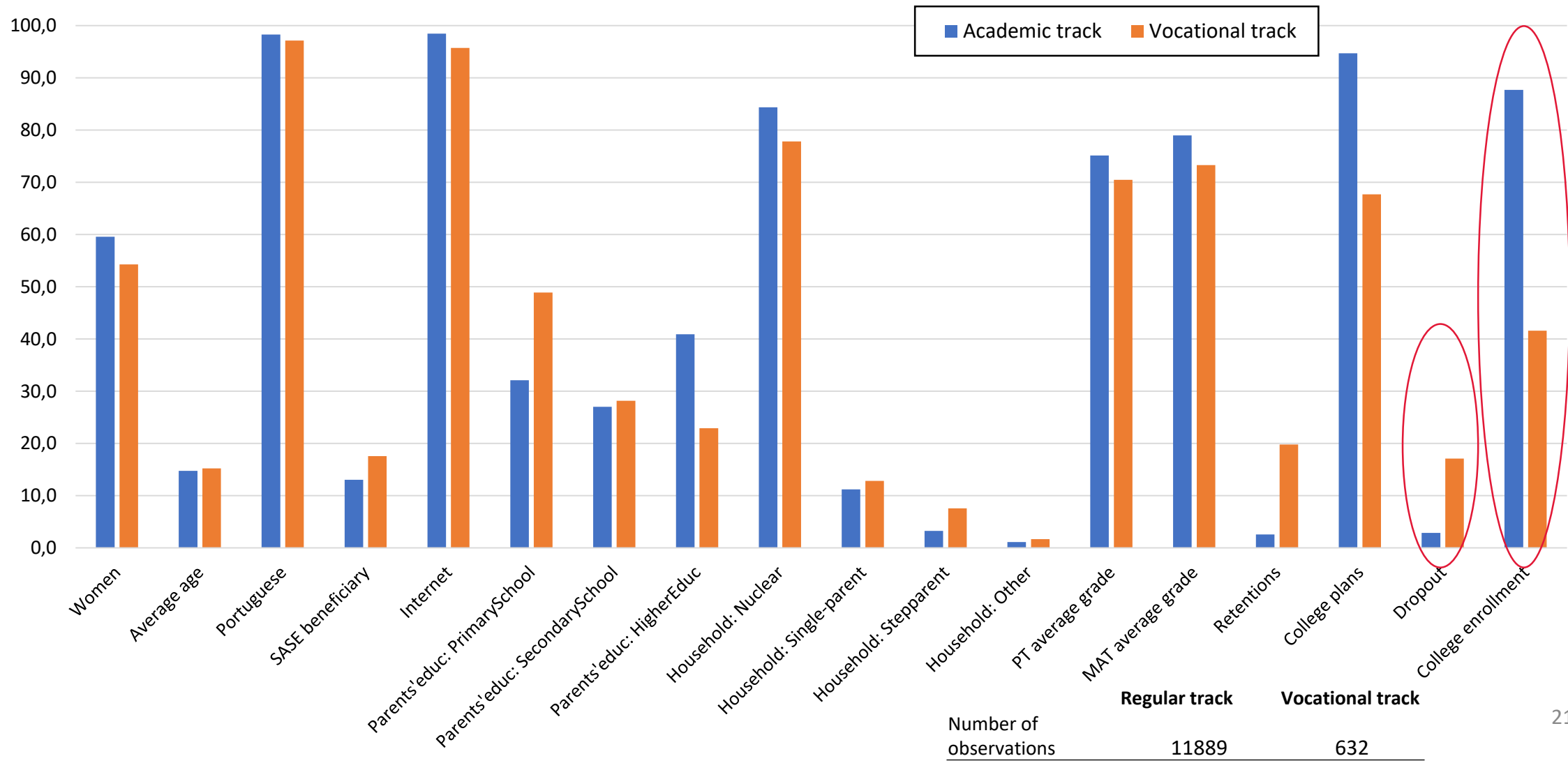
# Estatísticas descritivas – Amostra total



# Estatísticas descritivas – Low performance



# Estatísticas descritivas – High performance



# Modelos econométricos

## Model 1

$$voctrack_i = \beta_0 + \beta_1 female_i + \beta_2 portuguese_i + \beta_3 subsidy_i + \beta_4 internet_i + \delta_1 parenteduc_i + \delta_2 household + \beta_{10} examscorePT_i + \beta_{11} examscoreMATH_i + \beta_{12} retention_i + \beta_{13} expectations_i + \varepsilon_i$$

## Model 2

$$\left. \begin{array}{l} college\ enrollment_i \\ dropout_i \end{array} \right\} Y_i = \beta_0 + \delta voctrack_i + \beta X's + \varepsilon_i$$

# Modelos econométricos

## Model 1

$$\text{voctrack}_i = \beta_0 + \beta_1 \text{female}_i + \beta_2 \text{portuguese}_i + \beta_3 \text{subsidy}_i + \beta_4 \text{internet}_i + \delta_1 \text{parenteduc}_i + \delta_2 \text{household} + \beta_{10} \text{examscorePT}_i + \beta_{11} \text{examscoreMATH}_i + \beta_{12} \text{retention}_i + \beta_{13} \text{expectations}_i + \varepsilon_i$$

## Model 2

$$\left. \begin{array}{l} \text{college enrollment}_i \\ \text{dropout}_i \end{array} \right\} Y_i = \beta_0 + \delta \text{voctrack}_i + \beta X'_i + \varepsilon_i$$

# Modelos econométricos

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- Linear Probability Model
- Logistic Regression Model
- Propensity Score Matching (apenas para o Modelo 2)



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# Resultados – Questão auxiliar

1. Como é que cada um destes fatores afeta a probabilidade de um aluno seguir a via profissional, **para cada um dos subgrupos analisados?**

## Low-performance:

- Retenções anteriores
- Expectativa de ingressar o ensino superior
- **Educação dos pais/tutores**
- **Género**

## High-performance:

- Retenções anteriores
- Expectativa de ingressar o ensino superior
- **Ambiente socioeconómico**
- **Agregado familiar**

# Resultados – Questão principal

2. Que impacto tem o ensino profissional sobre as probabilidades de abandono escolar e de ingresso no ensino superior?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

\*Columns (1a), (2a), (3a) and (4a) include college expectations as a control variable.

# Resultados – Ensino Superior

2. Que impacto tem o ensino profissional sobre as probabilidades de abandono escolar e de **ingresso no ensino superior**?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

\*Columns (1a), (2a), (3a) and (4a) include college expectations as a control variable.

# Resultados – Ensino Superior

2. Que impacto tem o ensino profissional sobre as probabilidades de abandono escolar e de **ingresso no ensino superior**?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

\*Columns (1a), (2a), (3a) and (4a) include college expectations as a control variable.

# Resultados – Ensino Superior

2. Que impacto tem o ensino profissional sobre as probabilidades de abandono escolar e de **ingresso no ensino superior**?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	-0.208*** (0.00939)	-0.174*** (0.00939)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

Dentro do grupo high-performance, alunos que optam pela via profissional são, em **média 17,4 p.p. menos propensos a ingressar no ensino superior**, comparando com um aluno deste grupo que optou pela via académica.

# Resultados – Ensino Superior

2. Que impacto tem o ensino profissional sobre as probabilidades de abandono escolar e de **ingresso no ensino superior**?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00925)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

Dentro do grupo low-performance, alunos que optam pela via profissional são, em **média 15,1 p.p. menos propensos a ingressar no ensino superior**, comparando com um aluno deste grupo que optou pela via académica.



# Resultados – Abandono escolar

2. Que impacto tem o ensino profissional sobre as probabilidades de **abandono escolar** e de ingresso no ensino superior?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

\*Columns (1a), (2a), (3a) and (4a) include college expectations as a control variable.

# Resultados – Abandono escolar

2. Que impacto tem o ensino profissional sobre as probabilidades de **abandono escolar** e de ingresso no ensino superior?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

\*Columns (1a), (2a), (3a) and (4a) include college expectations as a control variable.

# Resultados – Abandono escolar

2. Que impacto tem o ensino profissional sobre as probabilidades de **abandono escolar** e de ingresso no ensino superior?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
voctrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00485)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

Dentro do grupo high-performance, alunos que optam pela via profissional são, em **média 4,85 p.p. mais propensos a abandonar a escola**, comparando com um aluno deste grupo que optou pela via académica.

# Resultados – Abandono escolar

2. Que impacto tem o ensino profissional sobre as probabilidades de **abandono escolar** e de ingresso no ensino superior?

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
voctrack	-0.208*** (0.00939)	-0.174*** (0.00965)	0.0535*** (0.00464)	0.0485*** (0.00469)	-0.175*** (0.00935)	-0.151*** (0.00919)	-0.138*** (0.00949)	-0.149*** (0.00976)

Dentro do grupo low-performance, alunos que optam pela via profissional são, em **média 14,9 p.p. menos propensos a abandonar a escola**, comparando com um aluno deste grupo que optou pela via académica.

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# Conclusões

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## Ingresso no ensino superior:

- **Negativo** para ambos os subgrupos de estudantes

## Abandono escolar precoce:

- **Heterogéneo**
  - Os CP são eficazes na redução da probabilidade de abandono escolar para alunos com desempenhos escolares mais fracos
  - Os CP afetam negativamente o sucesso académico dos alunos com desempenhos escolares mais elevados

# Limitações e pesquisa futura

## Limitações:

- **Desproporção** na distribuição do número de estudantes de desempenhos escolares mais elevados
- **Omissão de variáveis** no modelo relacionadas com as escolas e turmas
- Resposta ao questionário OTES é **voluntário**

## Sugestão de investigação futura:

- Porque são os estudantes de maior desempenho escolar mais propensos ao abandono escolar ao frequentarem CP?



# Obrigada pela vossa atenção.

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## Q&A

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# Appendix - 1

**Table 3.** Results for model 1 predicting participation in vocational track.

	(1) OLS	(1a) OLS	(2) Logit	(2a) Logit
female	-0.0654*** (0.00379)	-0.0378*** (0.00370)	-0.0660*** (0.00362)	-0.0401*** (0.00356)
portuguese	-0.0149 (0.0111)	-0.0235** (0.0107)	-0.00797 (0.00881)	-0.0158* (0.00847)
sase	0.000288 (0.00517)	-0.00373 (0.00497)	0.00394 (0.00447)	-0.000406 (0.00434)
internet	-0.0534*** (0.0113)	-0.0258** (0.0109)	-0.0362*** (0.00828)	-0.0167** (0.00802)
second_Educ	-0.0640*** (0.00450)	-0.0346*** (0.00439)	-0.0565*** (0.00426)	-0.0313*** (0.00416)
higher_Educ	-0.0797*** (0.00460)	-0.0445*** (0.00450)	-0.114*** (0.00598)	-0.0750*** (0.00580)
household_2	0.00730 (0.00556)	0.00846 (0.00539)	0.00999* (0.00519)	0.0103** (0.00501)
household_3	0.0277*** (0.00907)	0.0223** (0.00887)	0.0334*** (0.00765)	0.0269*** (0.00735)
household_4	0.0282* (0.0146)	0.0224 (0.0141)	0.0308*** (0.0113)	0.0247** (0.0110)
examscore_PT	-0.00436*** (0.000158)	-0.00336*** (0.000154)	-0.00485*** (0.000149)	-0.00390*** (0.000146)
examscore_Math	-0.00307*** (0.000110)	-0.00232*** (0.000107)	-0.00327*** (0.000100)	-0.00257*** (9.85e-05)
retentions	0.228*** (0.00565)	0.193*** (0.00559)	0.149*** (0.00358)	0.127*** (0.00354)
expectations	- -	-0.253*** (0.00550)	- -	-0.166*** (0.00330)
Observations	44919	44919	44,919	44,919
R <sup>2</sup> / Pseudo-R <sup>2</sup>	0.234	0.286	0.227	0.268

# Appendix - 2

**Table 4.** Results for model 1 predicting participation in vocational track, separately for high and low performance students.

	High-performance group				Low-performance group			
	(3) OLS	(3a) OLS	(4) Logit	(4a) Logit	(5) OLS	(5a) OLS	(6) Logit	(6a) Logit
female	-0.00885** (0.00394)	-0.00130 (0.00384)	-0.00851** (0.00384)	-0.00119 (0.00379)	-0.113*** (0.0110)	-0.0710*** (0.0109)	-0.112*** (0.0107)	-0.0705*** (0.0106)
portuguese	-0.0135 (0.0179)	-0.0157 (0.0175)	-0.0101 (0.0121)	-0.0150 (0.0116)	-0.00888 (0.0228)	-0.0192 (0.0224)	-0.00976 (0.0226)	-0.0199 (0.0218)
subsidy	0.00281 (0.00678)	0.00166 (0.00655)	0.00282 (0.00524)	0.00119 (0.00517)	0.0106 (0.0137)	0.00389 (0.0132)	0.0107 (0.0135)	0.00379 (0.0131)
internet	-0.0642*** (0.0229)	-0.0439** (0.0222)	-0.0386*** (0.0103)	-0.0249** (0.0103)	-0.0309 (0.0228)	-0.00849 (0.0222)	-0.0314 (0.0227)	-0.00870 (0.0220)
second_educ	-0.0180*** (0.00559)	-0.0100* (0.00540)	-0.0151*** (0.00467)	-0.00980** (0.00459)	-0.075*** (0.0133)	-0.0401*** (0.0131)	-0.074*** (0.0131)	-0.0391*** (0.0129)
higher_educ	-0.0393*** (0.00508)	-0.0259*** (0.00480)	-0.0423*** (0.00524)	-0.0307*** (0.00509)	-0.176*** (0.0204)	-0.109*** (0.0202)	-0.177*** (0.0211)	-0.109*** (0.0207)
household_2	0.00308 (0.00632)	0.00230 (0.00619)	0.00261 (0.00586)	0.000867 (0.00577)	0.000595 (0.0162)	0.00340 (0.0157)	0.000531 (0.0161)	0.00324 (0.0155)
household_3	0.0538*** (0.0148)	0.0498*** (0.0143)	0.0375*** (0.00778)	0.0338*** (0.00759)	0.0390* (0.0230)	0.0400* (0.0227)	0.0392* (0.0230)	0.0397* (0.0222)
household_4	-0.00153 (0.0217)	-0.00228 (0.0219)	0.000117 (0.0153)	-0.00186 (0.0152)	0.00531 (0.0318)	-0.00547 (0.0308)	0.00585 (0.0321)	-0.00490 (0.0310)
retentions	0.230*** (0.0218)	0.192*** (0.0211)	0.0884*** (0.0057)	0.0681*** (0.0057)	0.224*** (0.0112)	0.195*** (0.0111)	0.215*** (0.0100)	0.187*** (0.0099)
expectations	- (0.0144)	-0.173*** (0.0144)	- (0.0144)	-0.0750*** (0.0047)	- (0.0115)	-0.247*** (0.0115)	- (0.0115)	-0.229*** (0.0096)
Observations	12,472	12,472	12,472	12,472	7,584	7,584	7,584	7,584
R <sup>2</sup> / Pseudo-R <sup>2</sup>	0.062	0.100	0.108	0.155	0.101	0.156	0.076	0.119

# Appendix - 3

**Table 5.** Results of model 2 predicting college enrolment and dropout probabilities for high and low performance students.

	High-performance group				Low-performance group			
	(1) College	(1a) College	(2) Dropout	(2a) Dropout	(3) College	(3a) College	(4) Dropout	(4a) Dropout
votrack	<b>-0.208***</b> (0.00939)	<b>-0.174***</b> (0.00965)	<b>0.0535***</b> (0.00464)	<b>0.0485***</b> (0.00469)	<b>-0.175***</b> (0.00935)	<b>-0.151***</b> (0.00919)	<b>-0.138***</b> (0.00949)	<b>-0.149***</b> (0.00976)
female	0.0334*** (0.00592)	0.0221*** (0.00583)	-0.00664** (0.00330)	-0.00496 (0.00331)	0.0372*** (0.00706)	0.0228*** (0.00706)	-0.0321*** (0.00929)	-0.0248*** (0.00940)
portuguese	0.0827*** (0.0181)	0.0846*** (0.0174)	-0.0224** (0.00881)	-0.0236*** (0.00878)	0.0358** (0.0172)	0.0373** (0.0168)	-0.0692*** (0.0172)	-0.0713*** (0.0171)
subsidy	-0.0146* (0.00824)	-0.0129 (0.00815)	0.00103 (0.00516)	0.000713 (0.00517)	-0.00384 (0.00879)	-0.00231 (0.00870)	-0.0152 (0.0117)	-0.0163 (0.0116)
internet	0.0499*** (0.0188)	0.0271 (0.0190)	-0.0118 (0.0107)	-0.00803 (0.0108)	0.0537*** (0.0191)	0.0443** (0.0188)	-0.0415** (0.0178)	-0.0377** (0.0178)
second_educ	0.0494*** (0.00737)	0.0398*** (0.00725)	0.00550 (0.00444)	0.00760* (0.00448)	0.0459*** (0.00799)	0.0364*** (0.00789)	0.00178 (0.0111)	0.00720 (0.0112)
higher_educ	0.0992*** (0.00766)	0.0804*** (0.00752)	0.0114*** (0.00429)	0.0148*** (0.00439)	0.0843*** (0.0108)	0.0661*** (0.0107)	-0.0168 (0.0175)	-0.00650 (0.0176)
household_2	-0.0314*** (0.00875)	-0.0304*** (0.00856)	0.00319 (0.00496)	0.00277 (0.00496)	-0.0175 (0.0107)	-0.0179* (0.0106)	0.0436*** (0.0129)	0.0440*** (0.0129)
household_3	-0.0717*** (0.0136)	-0.0679*** (0.0133)	0.00807 (0.00764)	0.00787 (0.00760)	-0.0284* (0.0160)	-0.0262* (0.0157)	0.0286 (0.0186)	0.0292 (0.0186)
household_4	-0.0639*** (0.0222)	-0.0640*** (0.0216)	0.0365*** (0.00960)	0.0371*** (0.00960)	-0.0419* (0.0252)	-0.0354 (0.0247)	0.0553** (0.0248)	0.0536** (0.0248)
retentions	-0.179*** (0.0117)	-0.155*** (0.0118)	0.0342*** (0.00571)	0.0284*** (0.00582)	-0.0730*** (0.00750)	-0.0666*** (0.00738)	0.0728*** (0.00962)	0.0697*** (0.00963)
expectations	- (0.00846)	0.164*** (0.00846)	-	-0.0262*** (0.00495)	- (0.00833)	0.0941*** (0.00833)	-	-0.0465*** (0.00992)
Observations	12,521	12,521	12,472	12,472	7,584	7,584	7,584	7,584
Pseudo-R <sup>2</sup>	0.128	0.160	0.106	0.113	0.181	0.206	0.050	0.053

# Appendix - 4

**Table 6.** Average treatment effect of model 2 regarding college enrollment and dropout probabilities for low ability students.

		(9)	(10)	(11)	(12)
		College	College (controlling for expectations)	Dropout	Dropout (controlling for expectations)
ATE	votrack	-0.160*** (0.00807)	-0.134*** (0.00839)	-0.126*** (0.0115)	-0.136*** (0.0129)
Observations		7,584	7,584	7,584	7,584

**Table 7.** Average treatment effect of model 2 regarding college enrollment and dropout probabilities for high ability students.

		(13)	(14)	(15)	(16)
		College	College (controlling for expectations)	Dropout	Dropout (controlling for expectations)
ATE	votrack	-0.327*** (0.0289)	-0.295*** (0.0373)	0.0864*** (0.0167)	0.0927*** (0.0147)
Observations		12,472	12,472	12,472	12,472

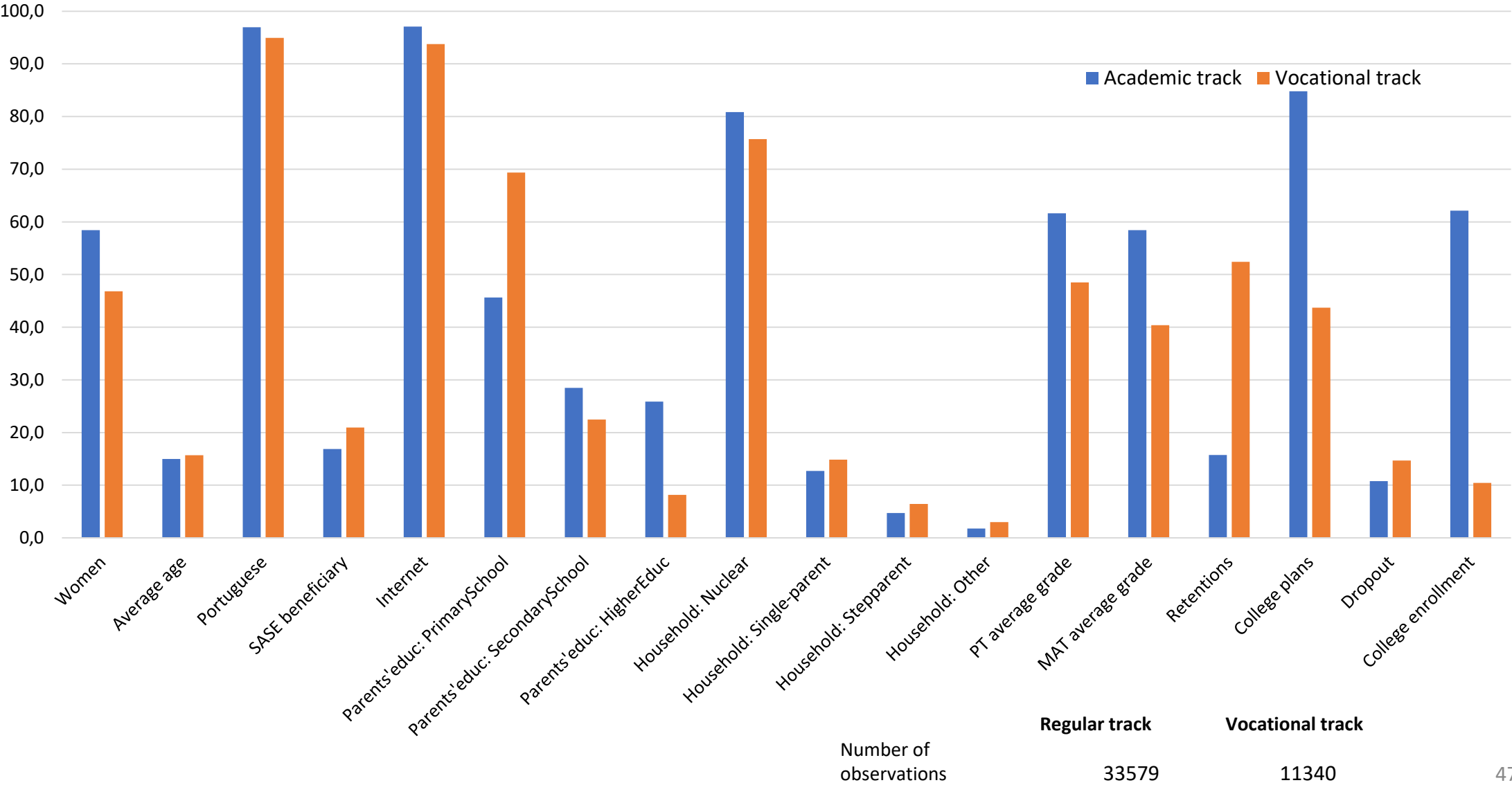
# Appendix - 5

**Table 5.a).** Effect of vocational coursetaking on college enrolment and dropout probabilities for the whole sample.

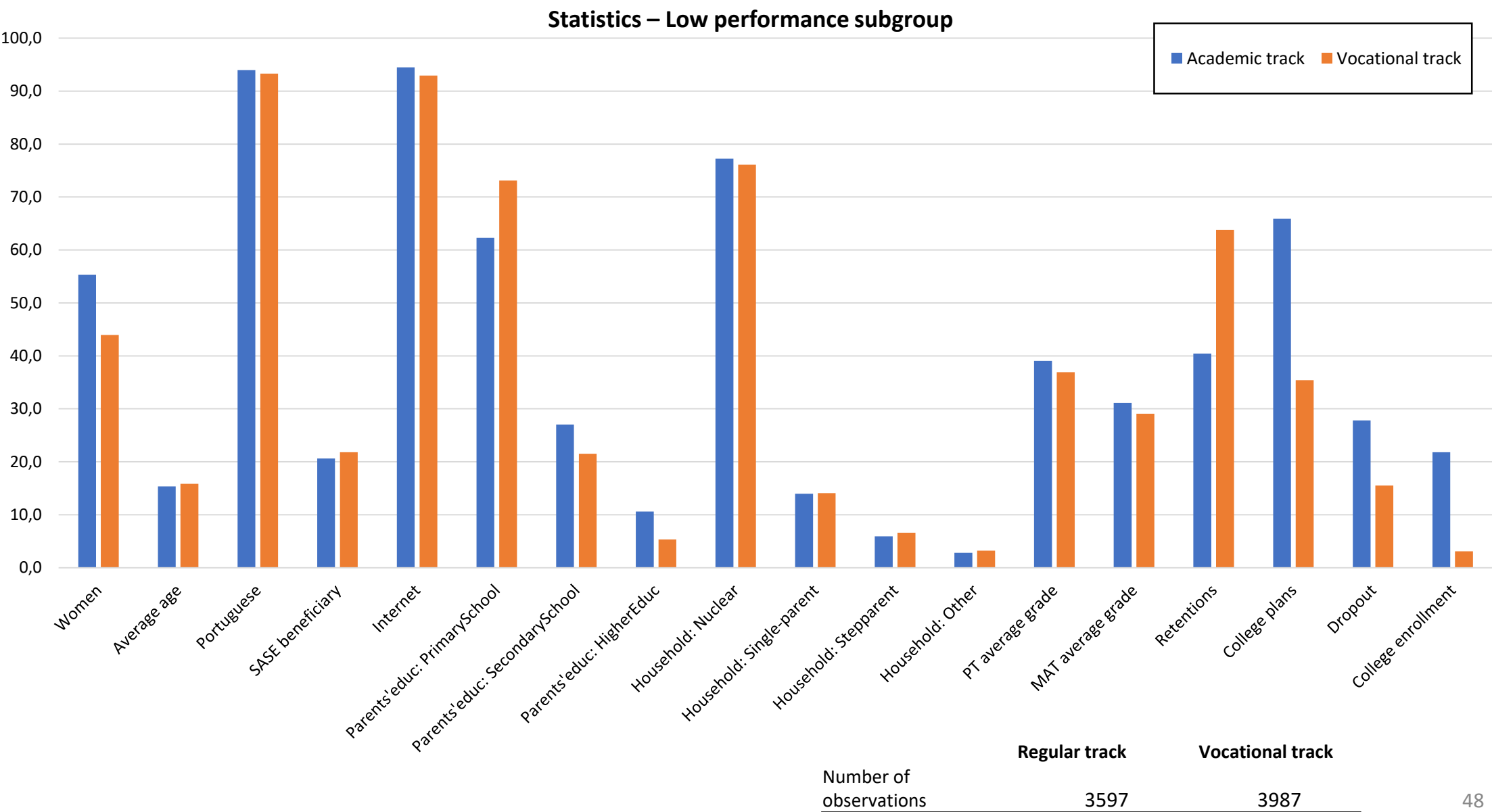
	(7) college	(7a) college	(8) dropout	(8a) dropout
vocktrack	-0.243*** (0.00485)	-0.202*** (0.00495)	-0.0420*** (0.00355)	-0.0520*** (0.00365)
female	0.0532*** (0.00372)	0.0375*** (0.00369)	-0.0239*** (0.00304)	-0.0190*** (0.00306)
portuguese	0.0590*** (0.0103)	0.0622*** (0.0101)	-0.0348*** (0.00647)	-0.0369*** (0.00645)
subsidy	-0.00726 (0.00471)	-0.00422 (0.00466)	-0.00659* (0.00388)	-0.00743* (0.00387)
internet	0.0596*** (0.0104)	0.0440*** (0.0103)	-0.0232*** (0.00653)	-0.0195*** (0.00653)
second_Educ	0.0592*** (0.00422)	0.0446*** (0.00417)	0.00418 (0.00352)	0.00869** (0.00354)
higher_Educ	0.107*** (0.00506)	0.0860*** (0.00499)	-0.00354 (0.00456)	0.00272 (0.00459)
household_2	-0.0253*** (0.00537)	-0.0260*** (0.00526)	0.0223*** (0.00410)	0.0225*** (0.00409)
household_3	-0.0584*** (0.00827)	-0.0532*** (0.00811)	0.0334*** (0.00587)	0.0328*** (0.00585)
household_4	-0.0395*** (0.0131)	-0.0373*** (0.0129)	0.0439*** (0.00850)	0.0429*** (0.00848)
examscore_PT	0.00608*** (0.000152)	0.00555*** (0.000150)	-0.00221*** (0.000126)	-0.00207*** (0.000126)
examscore_Math	0.00442*** (9.94e-05)	0.00403*** (9.90e-05)	-0.00179*** (8.65e-05)	-0.00169*** (8.66e-05)
retentions	-0.126*** (0.00471)	-0.114*** (0.00465)	0.0528*** (0.00336)	0.0497*** (0.00335)
expectations	- (0.00462)	0.160*** (0.00462)	- (0.00341)	-0.0403*** (0.00341)
Observations	44,919	44,919	44,919	44,919

# Appendix - 6

Statistics – Population of students in Secondary School



# Appendix - 7





# Appendix - 8

